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Editor's Word

Dear reader,

We are delivering the first issue of 2021, another year of resilience, faith, and belief in the victory of science. We hope that the coming year is one of many changes and many lessons learned from the challenges we have overcome. We want to congratulate the authors, especially those in management accounting, a very rich field but lacking publications to be discussed in the academic milieu.

The guest editorial is by Professor Diana Paula. She has a Ph.D. in Nursing and has recently attended some lectures in the accounting field, talking about scientificity and methodologies. I believe it is essential to realize there are no differences between concerns and scientificity among the different sciences. All share the same concerns, despite the distinct paradigms and contents.

The papers were approved in blind review, and the first was written by Cassiana Bortoli and Rodrigo Soares. The paper's objective was to theoretically ground the construct "Financial Sophistication", proposing three metrics and sharing contemporary studies' propositions. The academic education and professional experience characteristics in finances that based the construct were: International and Financial training; and Experience-Area, Financial Sector, as a CFO, CEO, International Experience, and Top-level Position in Another Company. The study also proposes three indexes: Academic Financial Sophistication, Professional Financial Sophistication, and Financial Sophistication (which combines the previous two).

The second paper is authored by Vinícius Martins, Sheila da Silva, and Igor da Luz. The authors studied the influence of self-esteem and advisor-advisee relationship on Burnout Syndrome among graduate Accounting students in Brazil. The results show a negative influence of perceived self-esteem on the Burnout Syndrome, stressing the importance of self-esteem when dealing with the challenges thedemands of graduate studies impose. There is also a negative and significant influence of having easy access to advisors on the feeling of low efficacy and between a good advisor-advisee relationship and the feeling of exhaustion.

The third paper was written by Joice de Oliveira, Marlon Silva, and João Estevão Neto. Its objective was to identify the relationship between current cost per student in federal universities and undergraduate student performance. The authors found no statistically significant relationship between current cost per student and academic performance. Nonetheless, sociodemographic variables such as race, sex, marital status, maternal education, and income were related to student performance.

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The fourth paper, written by FábioFrezatti, Franciele Beck, Daniel Mucci, and Daiani Schlup, discusses the feasibility of surveys depending on the needs of investigations conducted in applied sciences. The motivation to use this technique derives from the need to improve the collection of not readily available data (either because data are specific, qualitative, or confidential) without compromising scientific rigor. The results emphasize the (i) importance of establishing the target-population and sample, choosing aggregation criteria and means to access the companies; (ii) the need to use objective communication to collect data and sensitize respondents by using reminders via LinkedIn®; and (iii) the importance of considering the community research logic, associated with establishing and complying with a research contract.

The fifth paper was written by Daniel Mucci, Franciele Beck, and Fábio Frezatti in the management accounting field. It was intended to investigate the different configurations of the budgeting process used by medium and large companies operating in Brazil, considering planning, execution, assessment, and cross-sectional characteristics. This study's relevance lies in the fact that it treats the budgeting process holistically, considering budgeting profiles adopted by companies. By combining planning, execution, assessment, and cross-sectional characteristics, the cluster analysis suggests different configurations that show that the budgeting process has different levels of maturity: Budget as mere discourse, Almost planning, Embryonic budget, Budget with a static planning structure, and Budget with a flexible structure.

The final paper in the management field, written by Marines Lucia Boff, Carline Savariz, and Ilse Beuren, was intended to analyze the influence of formal and informal controls on organizational commitment, mediated by organizational confidence. The study's results show that formal and informal controls influence organizational commitment, while organizational confidence plays a mediator role and indirectly influences this relationship. It indicates that the interaction between formal and informal controls with organizational commitment is reinforced by organizational confidence.

Finally, I would like to emphasize that REPeC is not a journal linked to education only, but to various fields, as shown in its objectives: Financial, Managerial, Public, Audit, Taxes, and others.

Without further ado, I am grateful for all researchers who submitted their papers to REPeC and the always helpful referees. Many thanks to the readers! I hope you will enjoy this new issue.

Academic greetings,

Gerlando Lima, Ph.D.
Editor in Chief.

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The problem in scientific knowledge

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What is the method of my research project?

This is the first question advisors usually hear from students, who are always concerned with data collection techniques and whether their project will be qualitative or quantitative. Sometimes, we even label ourselves: "I am a professor who only works with quantitative data". Based on that, students who identify themselves with that line of work seek our advisement. To what extent does a researcher define the method that will be developed in a study? How do we delimit a methodological path?

Based on these considerations, other questions regarding science emerge. It is common to hear criticism regarding scientific advancements. Does science produce positive results for society, or is it only an instrument of power?

These questions span several decades and permeate the most different contexts, yet, remain current and relevant. Contributing to the training of students from a critical-reflexive perspective has the potential to improve their academic achievements, enable them to learn how to read and understand what a researcher is telling, and engage in academic tasks by methodologically organizing their thoughts and seeking to solve problems. In the long term, research will be applied in their field of work and professional practice to continue improving their performance and elevating their performance and understanding.

What we wish to clarify first is that a research method is not simply delimited by theoretical preferences; instead, there is a context surrounding a researcher and all the variables that involve a given topic that needs to be considered. Moreover, researchers need to master a given methodology while the topic chosen needs to be well-delimited and contextualized to only then decide on the project's scientific method.

Why study the scientific method?

Scientific research is considered the best method humans developed to obtain reliable knowledge. The researchers' questions and the method used to answer such questions emerge from researchers' perspectives regarding how the world functions.

This is what we call paradigm, a global overview, an overall perspective on the world's complexities. In this context, it is vital that researchers have a minimum understanding of the epistemology of knowledge, and be able to reflect upon reality, the approach involving all the processes, and how a study object is related to themselves as researchers, and what values pertain to this object.

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Habermas (2002) considers that it is not a matter of changing or improving the situation of subject-centered reasoning. The paradigm that represents the knowledge of objects should be replaced by the paradigm of understanding among individuals able to talk and act. In the knowledge paradigm, a conscious individual refers to him/herself in the same way as to entities of the world. In the understanding paradigm, when the ego talks and the alter takes a stand, they participate in an interpersonal relationship. Hence, the ego is in a relationship that, from the alter's perspective, enables it to refer to itself as the participant in an interaction.

Therefore, it is essential to realize that scientific knowledge is produced by individuals who think, feel, and do and there is a constant interaction between thinking, feeling, and doing. Hence, researchers need to rethink the strict sequence of steps taught in the scientific method, which starts with observation and culminates into a conclusion, a discovery (Moreira, 1993).

To understand how research is developed, how a given result is highly accurate or little significant, or yet, how a thesis is refuted, it is essential to study the method, the methodology. It is vital to know and practice; only then is it possible to assess the results of studies critically.

Hence, some concepts need to be clarified. Know that method originates from the Greek *méthodos* (*meta*= following after +*ódos*= path). Following its origin, a method is one way or the way to reach an end or objective, which is distinguished from methodology, which originates from the Greek word *méthodos* (way to achieve an objective) +*logos* (knowledge). Hence, methodology is the study of method. Hence, there are procedures and rules implemented for a given method. Therefore, a scientific method is the science's way to reach an objective, while methodology refers to the rules established for a scientific method (Richardson, 2017, p. 16).

Now that we understand that the methodological path needs to be studied to be delimited, we start reflecting upon the selection of the best technique to collect data and the most appropriate strategy for analysis. It may even sound philosophical, but who or what defines a given method for a project is the research problem. Students need to understand the importance of a well-delimited research problem to describe what one desires to study clearly and what objective one aspires to achieve.

The contribution of the scientific method for society

We need to be autonomous and have the ability to problematize, contextualize, criticize, and reflect upon theoretical and applied studies to advance scientific knowledge. A research problem delimits the method and establishes socio-environmental relationships with scientific and technological concepts.

Lakatosand Marconi (1982, p. 39-40) refer to the method's distinctive characteristic of supporting understanding, in its broadest meaning, notthe results of scientific investigation, but the investigation process itself.

By corroborating this thought, we argue that the same object can be considered from different perspectives, but for it to happen, researchers need to master its content and all the circumstances that may influence it. A more comprehensive way to deal with degrees of differences between quantitative and qualitative methodological approaches lies upon the basic philosophical assumptions researchers assume and research strategies used in the entire study. Thus, once more, the need to acquire epistemological knowledge regarding science stands.

Therefore, there are some technical procedures to support the delimitation of a research problem. First, the problem must be a problem that draws attention and requires an answer. The researcher has to recompile information related to this problem and study potential relationships between pieces of information to contribute and clarify the problem and then propose potential explanations (hypotheses).

Based on these procedures, researchers need to understand that research is a way of thinking, critically analyzing the various aspects of daily professional practice, formulating guiding principles of a given procedure, and developing and testing new theories to contribute to the profession's advancement, benefiting society.

Understanding the application of the scientific method when addressing apparently non-scientific problems is essential to identify and transform reality (Richardson, 2017, p. 17). In this context, researchers need to be aware that their role is to keep this inter-relationship with society, considering potential risks and benefits of scientific discoveries, associated ethical issues, the interests involved, the origin of resources financing research, and potential economic, environmental, and social impacts.

Currently, the most significant challenge posed to professors and researchers is to enable students to acquire this autonomy and the ability to be critical, contextualize and problematize problems. Therefore, some personal and social considerations can be prioritized, and scientific research will produce a significant product in cultural, social, and technological terms to outgrow the academic environment in which it was developed and contribute to citizenship and science education training.

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From "0 to 1" – What is the "Financial Sophistication" level of a CEO?

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Abstract

Objective: The literature reports evidence regarding the importance of CEOs' financial expertise to support decision-making and maximize companies' value. Thus, this study's objective was to theoretically ground the creation of the construct "Financial Sophistication", proposing three metrics and sharing recent studies' propositions.

Method: Previous studies supported the development of the construct Financial Sophistication. After identifying and collecting academic and professional characteristics, Principal Components Analysis was used to compose the indexes.

Results: The characteristics concerning academic and professional experience in the financial field and which based the development of this construct were: International and Financial Training; and Experience: in the Sector, Financial Sector, as CFO, CEO, International Experience, and Top-level Position in Another Company. Based on these, three indexes were developed: Professional Financial Sophistication, Academic Financial Sophistication, and Professional and Academic Financial Sophistication (in which both dimensions are combined).

Contributions: The literature lacked a complete metric to measure CEOs' expertise, which would capture its impact on decision-making. Hence, this study focused on advancing science and anticipated studies applicable to the Brazilian context.

Keywords: Academic Knowledge, Professional Knowledge, Financial Sophistication, CEO, Expertise.

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1. Introduction

The chief executive officer (CEO) is responsible for a company's major decisions so that s/he should be aligned with maximizing value to shareholders. Murphy (1999) suggests that, according to agency relationship, shareholders, known to be the principal, try to strengthen ties with CEOs through contractually established benefits. The remuneration of a CEO is a way to equalize this interaction. Custódio, Ferreira, and Matos (2013) and Song and Wan (2017) indicate that the remuneration established in contracts should vary according to the CEO's professional and academic experiences. Aivazian, Lai, and Rahaman (2013) note that, in a competitive market, a manager's skills are priced, considering that his/her decisions reflect in profits. Given a context of continuous internationalization of markets, it is natural that the knowledge and experiences of candidates to management positions are increasingly required.

The need to recruit increasingly qualified professionals in the academic and professional milieus to work in top-level positions results in increasingly sophisticated professionals (Leite, 1997; Manfredi, 1998; Kuenzer, 2002; Rezende, 2002), considering all the preparation required for the desired position. Hence, hiring more financially qualified professionals tends to generate benefits for the agent and principal: the agent obtains a remuneration consistent with his/her intellectual capital, while the principal absorbs the benefits accruing from this hiring (in the form of better results). Rezende (2002) shows that hiring sophisticated intellectual capital is advantageous for a company, impacting its survival in a competitive economy. Therefore, the professionals assuming top-level positions tend to improve knowledge and professional experiences related to finances, which is called in this study "Financial sophistication".

Among the factors interfering in executives' decisions, studies report: international training (Li, Sun & Ettredge, 2010; Li, Wei& Lin, 2016); academic training (Barros, 2005; Paton & Wagner, 2014; Saxena & Bendale, 2014; Torres & Augusto, 2017; Li et *al*, 2016); operating sector (Custódio *et al*., 2013); experience as CEO (Antia, Pantzalis & Park, 2010; Custódio *et al*., 2013; Dauth, Pronobis & Schmid, 2017); experience as CFO (Li et *al*., 2010; Li *et al*., 2016; Dauth*et al*., 2017); experience in top-level positions (Liderman, Schroeder & Sanders, 2010; Custódio *et al*., 2013); and internationalization (Li *et al*., 2010; Dutta, Malhotra & Zhu, 2016; Dauth*et al*., 2017). Hence, the literature indicates that the professional and academic experience of a CEO influences the quality of decisions (Huang, 2014).

Empirical studies show the need for a CEO to present high academic and professional knowledge related to finances. Faulconbridge, Beaverstock, Hall, and Hewitson (2009) and Dauth *et al*. (2017) highlight the importance of having a background in the business field in the international context to obtain greater knowledge about controls, international standards, and good governance practices. Custódio and Metzger (2014) and Duan, Hou, and Ress (2020) state that professional financial experience favors CEOs when selecting the best investment and financing policies, while international experience in the business field develops their ability to establish and implement international relationships and enter other markets. Training in the business field contributes to the development of expertise required to assume a CEO position (Torres & Augusto, 2017) because experience promotes a greater ability to reflect upon ways and potential outcomes to maximize value.

Knowledge related to financial management, whether it accrues from academic training or professional experiences, may be essential in a CEO's decision-making due to the need to make decisions quickly (Barros, 2005; Curi & Lozano-Vivas, 2020). However, studies published thus far consider aspects related to the training and financial experience separately, ignoring how a CEO's background can enhance results. Given this context, it is pertinent to measure CEOs' Financial Sophistication to identify how these characteristics interfere in decision-making. Therefore, this study's objective was to theoretically ground the construct "Financial Sophistication", proposing three metrics, and share recent studies' propositions.

This study's relevance lies upon the complementation of existing literature, as some authors express difficulties in measuring expertise, that is, both knowledge and experience. Huang (2014) highlights that even though researchers know that management skills vary among agents and affect organizational decisions and a company's value, few studies investigate the managers' expertise, which shows there is a need for studies to contribute to the literature and propose measurements. As highlighted by the author, researchers find difficulties in measuring such characteristics. In this sense, this study focused on proposing metrics that numerically dimension the set of expertise related to the financial field acquired throughout a CEO's academic and professional life. This set of expertise is called here "Financial Sophistication". The contribution of such measures to the business field in general, specifically for the financial field, is that these measures can be used in future studies to promote a greater understanding of decision-making at the companies' level.

2. Theoretical framework

2.1 Human Capital

The socio-economic development from the 1950s and 1960s exalted the need for qualification, in the sense that human resources needed to be capable to operate in an industrial system (Manfredi, 1998). The author considers that professional qualification narrows the relationship between occupational and educational systems, while the construct "qualification" is observed in applied social sciences. He defends that training and how knowledge is developed are critical for forming human capital and are the solution for the scarcity of people who master specific skills to develop activities in the modernization process. This understanding ended up leading to the theory of human capital, widely known by the rapid modernization at the time, which was seen as the adoption of a capitalist industrial model. The qualification process started drawing greater attention due to a lack of trained professionals to occupy certain positions, and for this reason, a national training system was deemed necessary.

The establishment of national training systems at different hierarchical levels was called formal qualification (Manfredi, 1998). Barbosa Filho, Pessoa, and Veloso (2010) recognize that human capital comprises educational levels and professional experience. In this context, Manfredi (1998) notes that the organizations desired several graduated employees for a specific area of expertise because they believed that formal qualification would promote companies' development. Considering that formal qualification involves knowledge at different levels, some authors called over-education or over-qualification the effect of popular confidence on high-qualified individuals. This fact results in qualification, which in general is higher than what would be needed to perform the tasks of a given position (Manfredi, 1998).

The parameters established to introduce an individual in a position and the understanding of formal job market is that qualification is privatized; that is, each individual is responsible for accumulating technical-scientific knowledge, skills, abilities, knowledge, and experiences that are acquired throughout academic and professional life (Manfredi, 1998). Professional education can be achieved in three ways: academic knowledge, professional experience, or the combination of both (Kuenzer, 2002). Leite (1997), Godoy, and D'Amélio (2012) understand competence academic and professional knowledge, which develop capacity and skills (technical and cognitive), respectively, and when companies identify flaws in private qualification that can affect performance, alternatives to recycle knowledge considered necessary for a company need to be devised.

Companies depend on their collaborators' knowledge to perform activities the best way possible, which makes apparent the need to implement internal training processes. Even though some companies and fields do not address collaborators' training to be an essential aspect of competitiveness, the importance assigned to training and knowledge recycling has gradually increased (Barzegar & Farjad, 2011; Batalla-Busquets & Martínez-Argüelles, 2014). Based on business returns accruing from continuing education, the literature in economics complement the literature in education in terms of professional training (Grip & Sauermann, 2013). The authors report three lines of research in the literature in the economic field that refer to contributions of continuing education: (1) the effects of the recycling process on productivity; (2) the returns of recycling when this is hired; and (3) which is considered a "black box", the effect of training on the collaborators' actual performance. If an individual's training can impact a company's performance (Nakabashi& Figueiredo, 2008), it seems logical to consider training when hiring a professional, especially if the candidate aspires to a top-level position.

2.2 Financial Sophistication

A company's future success can be significantly influenced by its ability to find, recruit, and retain the most talented executives, who can promote inspiring, innovative, and profitable management in a knowledge-based economy (Faulconbridge *et al.*, 2009; Dickel Moura, 2016). Faulconbridge *et al.* (2009) highlight the importance of candidates to top-level administrative positions to be a "global citizen", whether because they assumed important positions in big international companies or because they acquired a degree in an international business school, which are seen as a differential. International expertise among top-level administrative positions is considered by companies as an alternative to improve their controls, as these individuals tend to be more familiar with international standards regarding reporting practices and governance that are common among countries more economically developed.

The managers' characteristics are usually associated with the quality of financial statements. This understanding guides various studies. Li *et al.* (2016) seek to understand aspects considered in the decision-making process of investors and market analysts. Dauth *et al.* (2017) consider that an executive's international profile, in terms of nationality, educational background, professional experience, and remaining commitments concerned with international committees, might be associated with financial statements' quality. Fran, Gui, Li & Zhu (2016) also highlight empirical evidence that the internationalization of a CEO or CFO adds to their ability to make financial decisions, as they have greater knowledge of international businesses, culture, and standards. Therefore, it may be advantageous for companies to use financial incentives for executives to constantly seek knowledge, maximizing shareholders' interests (Trejo, Gutiérrez & Guzman, 2016).

A CEO's academic and professional knowledge tends to reflect on performance so that a remuneration that is equivalent to these professionals' intellectual repertoire is due. Custódio*et al.* (2013) investigated whether the remunerations of CEOs with general skills were higher than those of individuals with specific skills. To measure these skills, they used information in resumes such as positions in different companies, specific sectors, conglomerates, and experience in the same position. These aspects reveal that generalist CEOs are risk-averse. Davis, DeBode, and Ketchen Jr. (2013) note that more qualified CEOs perform better, thus obtained better results. Hence, evidence suggests that companies prefer CEOs with greater expertise and offer superior remuneration as a mechanism to compensate knowledge that can be used to solve problems and promote improvements.

Executives are the individuals primarily responsible for two aspects: promote improvements and solve problems. The first is based on knowledge, and the second is driven by leadership (Liderman*et al.*, 2010). Problems are solved in two ways: by controlling situations and re-establishing the original state of things the fastest as possible using accumulated knowledge, or changing the original state of things, by impeding the occurrence of new problems (based on the experience acquired in the solution of a given problem), leading to improvements (Coho, Nag & Xia, 2015). Paraskos, Altima, McLean, and Cooper (2013) report that tacit knowledge (i.e., individual experiences, ideas, values, and emotions) is of companies' interest. Managing a company requires not only technical but also behavioral skills, primarily focusing on competence (academic knowledge and professional experience) (Saxena & Bendale, 2014).

Individuals aspiring to a CEO position should pursue the competence necessary. Paton and Wagner (2014) report these individuals are concerned with the curriculum of engineering schools that provide little or no courses related to strategic management. Therefore, to improve business-management skills, the candidates to a CEO position have complemented their training with MBAs or equivalent programs (Saxena & Bendale, 2014). Torres and Augusto (2017) return to the original notion that academic knowledge and knowledge acquired with professional experience, especially those linked to the business, accounting, economy, or financial fields, contribute to the development of knowledge and skills needed to work as a CEO. Additionally, the author reveals that such knowledge can be acquired through experiences. Hence, Financial Sophistication can be defined as the set of knowledge acquired throughout academic life and financial-related professional experiences.

3. Method

The construct Financial Sophistication (FS) is based on a logic that is similar to what is proposed by Barros (2005), Faulconbridge*et al.* (2009), Li*et al.*(2010), Custódio*et al.*(2013), Davis*et al.* (2013), Dauth*et al.* (2017), Torres and Augusto (2017) and Li*et al.*(2016), that is, an understanding that financial-related academic knowledge and professional experience are characteristics expected by those hiring a CEO, as such knowledge enables CEOs to maximize the shareholders' interests. Shareholders deposit their beliefs on managers' knowledge and experience, understating that these lead to more rational decisions and consequently improve the likelihood of a company's success (Kahneman, 2012).

In this sense, it seems appropriate to consider that expertise acquired both in the academic and professional milieus leads to three indexes: i) Academic Financial Sophistication Index (AFSI); ii) Professional Financial Sophistication Index (PFSI), andiii)Financial Sophistication Index (ISF). The latter comprises academic and professional expertise together. The motivation to consider the academic the professional dimensions separately is that there are situations in which both indexes, AFSI and PFSI, contradict each other, so that if there are analyzed together, they may totally or partially cancel the construct. Indexes are scored between "0" and "1", and the points are distributed according to the level of importance of each item, measured through Principal Components Analysis (PCA). PCA was chosen to measure the Financial Sophistication Indexed scored between "0" and "1", given the level of importance of this item in the factor. SPSS was used.

Based on previous studies, expertise items were identified and used in the composition of the following indexes: International and Financial Academic Training dimension; and dimension Professional Experience in the Sector, in the Financial Sector, as CFO, as CEO, International Experience, and Top-Level Position in Another Company. This information can be collected from secondary sources such as the CEO's resume available in Reference Forms (items 12.6 and 12.8), resumes available at IAN – Annual Information (the previous report was published up to 2008, replaced in 2010 by Reference Form), the company's website, LinkedIn, Lattes Platform, and from the news or magazines that published interviews related to a given CEO. Table 1 presents information to understand better how the indexes were developed.

Table 1

Financial Sophistication Index

Dimension	Variable	Item Measurement	Sign
Academic	International Training	Academic training (undergraduate and/or postgraduate studies) in international universities	+
	Financial Training	Academic training (undergraduate and/or postgraduate studies) in the field of finances (Business Administration, Accounting, Economy of Finances)	+
Professional	Experience in the Sector	Professional experience (in years) in the same sector as the company in which current works.	+
	Experience in the Financial Sector	Professional experience in companies in the financial sector.	+
	Experience as CFO	Professional experience as CFO.	+
	Experience as CEO	Experience (in years) as CEO in the current company.	+
	International Experience	Professional experience in international companies.	+
	Top-level position in another company	Top-level position in another company simultaneously to the CEO position.	+

Source: Developed by the authors.

Table 1 presents the ISF, composed of the academic dimension (2 items) and professional dimension (6 items). Only the expertise that corresponds to the academic and professional dimensions is needed to compose the AFSI and PFSI, respectively. Additionally, the column "Item Measurement" presents the description of information collected, while items "Experience in the Sector" and "Experience as CEO" are continuous variables and the remaining are dichotomous variables, in which 1, if the characteristic is present and 0, otherwise.

4. Metrics Proposed

A CEO's Financial Sophistication is composed of expertise acquired both in the academic and professional spheres and contributes to a business' management. Based on the eight items reported in the literature, data were collected and organized on an electronic spreadsheet (considering how each of the characteristics of the academic and professional dimensions described in Table 1 is measured). Later, the descriptions (answers) were coded as dichotomic variables (0 and 1), keeping only the items "Experience in the Sector" and "Experience as CEO" as continuous variables. Principal Components Analysis (PCA) was considered suitable to construct the ISF so that the distribution of scores would be coherent with each of the items considered to compose the index.

The following methodological procedures were adopted according to the sequence below (Field, 2009):

a. Pearson's Correlation Matrix – Factor analysis assumes a correlation between items; however, these should not be perfectly correlated. Lack of correlation of an item with the remaining may result in its exclusion, while the need for such exclusion can be confirmed with the following two tests.
b. Kaiser-Meyer-Olkin (KMO) and Bartlett– These tests are necessary to validate factor analysis. KMO ranges from 0 and 1, indicating that correlation patterns are relatively compact when values are relatively close to 1. Additionally, Kaiser established criteria to measure confidence on the factors; values above 0.7 are desirable. If any problems are identified in these two tests, one item will probably be deleted, which can be identified with greater precision in the Anti-Image Correlation Matrix.
c. Anti-Image Correlation Matrix – This test presents the individual KMO of items in the matrix diagonal; values above 0.7 are desirable. Hence, if relatively low values are found, the item needs to be eliminated, considering the lowest KMO. The tests and analysis previously performed are successfully repeated until acceptable parameters are obtained to grouping the factors (as recommended by Kaiser-Meyer-Olkin and Bartlett).

A database of 179 [B][3] listed companies from 2011 to 2015 was used (convenience sampling), which correspond to 326 different CEOs and 810 observations. Data were collected according to the recommendations in methodology. Note that when the initial tests (items "a", "b"and"c" above) showed the need to exclude item "Top-level position in another company".

According to the theoretical framework, Financial Sophistication was considered according to the items grouped in the academic and professional dimensions. Hence, eigenvalues, verified according to criteria established by Kaiser (Field, 2009), establish the factors that provide greater explained variance capacity, the number of initial components, and total variance, as shown in Table 2.

Table 2

Total variance explained

Component	Initial eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% variance	% cumulative	Total	% de variance	% cumulative	Total	% de variance	% cumulative
1	2,050	29,282	29,282	2,050	29,282	29,282	1,583	22,614	22,614
2	1,084	15,482	44,764	1,084	15,482	44,764	1,551	22,150	44,764
3	,997	14,241	59,005						
4	,869	12,419	71,424						
5	,791	11,301	82,725						
6	,712	10,170	92,895						
7	,497	7,105	100,000						

Source: developed by authors.

Table 2 presents the initial eigenvalues after extraction and lastly after rotation. The columns corresponding to the initial eigenvalues always present the same number of items and factors, forming one factor for each item and detecting correlations between the items to extract factors with higher loadings of explained variance to eliminate part of the variance with smaller explanatory potential. Thus, the first factors (components) of the initial eigenvalues and the extraction of factors present a higher percentage of explained variance. Decreasing order of explained variance can be verified when the components and corresponding explained variance is analyzed (component 1 represents 29.282% of the explained variance in the initial eigenvalues and after extraction. Component 2, in turn, presents the second-highest percentage of explained variance in these two stages, and so on successively for the remaining components).

The extraction of the factors is based on the eigenvalue that should be higher than 1 (the eigenvalues of each value are exhibited in the column called "Total"). Therefore, the initial eigenvalues indicate two factors (eigenvalue of 2.050 corresponding to the first factor, and eigenvalue of 1.084 corresponding to the second factor), which have an accumulated variance of 44.764%. The remaining factors were extracted so that only these two factors remained, which are presented in "extraction sums of squared loadings" and, finally, "rotation sums of squared loadings" would present the new values corresponding to the two factors.

The items need to be weakly, moderately, or strongly correlated for the two factors to be identified (Field, 2009). According to the set of correlations formed by the items, the variance of each item's data is constituted of unique variance and variance shared with the remaining items. The shared variance of each of the items, also called commonalities, is presented in Table 3.

Table 3

Commonalities

Items	Initial	Extraction
FI	1,000	,483
FF	1,000	,427
ER	1,000	,608
ESF	1,000	,271
EDF	1,000	,493
ECEO	1,000	,513
EI	1,000	,339

Legend: IT– International Training; FT– Financial Training; ES – Experience in the Sector; EFS–Experience in the Financial Sector; ECFO– Experience as CFO; ECEO – Experience as CEO; andIE– International Experience.

Source: developed by the authors.

Table 3 presents the values of the variances: unique ("Initial" column) and shared ("Extraction" column). The values presented in the "Initial" column represent each item's unique variance, since, as shown in the "Initial eigenvalues" column of Table 2, principal component analysis is based on the creation of one item per factor; hence, seven factors for seven items. Therefore, item variance is not shared; so that, we have value "1" for unique variance, also called error or random variance to communality. The value presented in column "Extraction" represents shared variance, that is, commonalities, considering that seven items remained for the two factors after extraction and rotation of factors, showing that some items shared the factor's explained variance. Table 2 also shows that it is possible to interpret the cumulative explained variance better, so that it is possible to verify that 44.764% of the variance of the items that belong to factors "1" and "2" is shared, so there are enough correlations to place them in groups called factors.

After grouping the items into two factors and obtaining the percentage of the factors' individual explained variance: factor "1" (22.614%) and factor "2" (22.150%) and cumulative variance of 44.764%, as presented in Table 2, the percentages of explained variance were re-dimensioned to 100%. This procedure enables maximizing data interpretation regarding each factor and later regarding each of the items to differentiate the importance assigned to each of the factors and then construct the Financial Sophistication Index (ISF). Based on this reasoning, it is enough to weigh the explained variance of each factor by the cumulative rotated variance to find the percentage that is consistent with each factor. Equation 1 presents the calculation of the factors.

$$\%\,Factor = \frac{ExplainedVarianceFactor}{CumulativeRotatedVariance} \quad (1)$$

The results from equation "4" show that factor "1" represents 50.52% of the index and factor "2" represents the complementary part, i.e., 49,48%. Once each factor's value is identified, it is necessary to distribute this percentage according to the items that compose it. Hence, it is possible to identify the percentage that is consistent with each item. Based on this, the rotated component matrix, Table 4, presents the items that belong to the factors, the items loadings, and scales the order of importance assigned to the items within the factors.

Table 4

Rotated component matrix

Components	1	2
FI	,695	
FF	-,675	
ER	,516	
ESF	-,512	-,501
EDF		,701
ECEO		,566
EI		,513

Legend: IT–International Training: academic training (undergraduate and/or postgraduate studies) in international universities; FT–Financial Training: academic training (undergraduate and/or postgraduate studies) in the field of finances (Business Administration, Accounting, Economy of Finances); ES – Experience in the Sector: professional experience (in years) in the same sector as the company in which current works; EFS–Experience in the Financial Sector: professional experience in companies in the financial sector; ECFO–Experience as CFO: Experience as CFO; ECEO –Experience as CEO: Experience (in years) as CEO in the current company;andIE–International Experience: professional experience in international companies.

Source: developed by the authors.

The Varimax rotation orthogonal method was used for the rotated component matrix to maximize the dispersion of loadings within the factors and loads a small number of items in each factor. Table 4 presents the items' loadings according to each factor; the closer to "1", the more consistent the item within the factor. Note that all the items present loadings higher than 0.4,consistent and coherent with the recommended factor structure (Field, 2009). Comparison of the components that composed the two factors and the components that composed the two theoretical dimensions, as shown in Table 3, shows that the structure of factor "1" is close to the academic dimension, and the structure of factor "2" is coherent with the professional dimension.

The academic dimension is composed of the following items: "International Training" and "Financial Training", as shown in Table 1. The components that formed factor 1, according to Table 4, are "International Training", "Financial Training", "Experience in the Sector"and "Experience in the Financial Sector". The component "Experience in the Financial Sector" does not belong to the academic dimension, neither does "Experience in the Sector", but are correlated to the factor's remaining components, so they were grouped. However, the component "Experience in the Financial Sector" presented loadings directed to this item in both factors (factor 1: -0.512 andfactor 2: -0.501),which are considered low (Table 4). Hence, the logic according to the literature, and used in the construct "Financial Sophistication", the item "Experience in the Financial Sector" was eliminated from factor 1 and only kept in factor 2. Thus, factor 1 represents the index's more academic portion, composed of the items International Training" and "Financial Training", and "Experience in the Sector".

The professional dimension is composed of items: "Experience in the Sector", "Experience in the Financial Sector", "Experience as CFO", "Experience as CEO", and "International Experience", as shown in Table 1 and confirmed by KMO. The components of factor 2, according to Table 4, are: "Experience in the Financial Sector", "Experience as CFO", "Experience as CEO", and "International Experience". Note that this dimension lost only one item, which shows the more professional portion of the index.

The signs of the loadings of components in the factors result from the structure of existing correlations, with no implication in the importance assigned to the item concerning the dimension. Therefore, after distributing the components to each factor, obtaining their respective loadings (according to Table 4), and considering the results from equation 1, it was possible to calculate the components' percentage for the Financial Sophistication Index. Based on this line of reasoning, it is enough to weigh the item loading by the sum of the loadings of all the items that compose the factor (disregarding the value of the loading sign) and multiplying it by the percentage of the index that corresponds to the factor (result from equation 4). This calculation is repeated for all the items in the factor. Hence, the sum of the items' values resulting from this calculation should be equivalent to the percentage assigned to the corresponding factor. Equation 2 presents the calculation of the items.

$$\%\,Item = \left(\frac{Item loading}{\sum of the items' loadings corresponding to the factor}\right) * \%\,Factor \quad (2)$$

Equations "1" and "2" enabled to assign weights to the items. Thus, Table 5 presents the percentages of the factors and items concerning the Financial Sophistication Index.

Table 5
Importance of the dimensions and items for the ISF

	Dimension	Weight	Items	Peso
Financial Sophistication Index	Academic	50,52%	FI	18,62%
			FF	18,07%
			ER	13,83%
	Professional	49,48%	ESF	10,87%
			EDF	15,21%
			ECEO	12,27%
			EI	11,13%

Legend: ISF – Financial Sophistication Index; IT –International Training: academic training (undergraduate and/or postgraduate studies) in international universities; FT – Financial Training: academic training (undergraduate and/or postgraduate studies) in the field of finances (Business Administration, Accounting, Economy of Finances); ES – Experience in the Sector: professional experience (in years) in the same sector as the company in which current works; EFS – Experience in the Financial Sector: professional experience in companies in the financial sector; ECFO – Experience as CFO: professional experience as CFO; ECEO – Experience as CEO: Experience (in years) as CEO in the current company; and IE – International Experience: professional experience in international companies.

Source: developed by the authors.

The results presented in Table 5 show that the percentages that correspond to the factors remained relatively close. Therefore, what makes the weights of the items different is the number of items corresponding to each factor and the items' loadings, as shown in Table 4. Note that the academic dimension represents 50.52%,andthe professionaldimension corresponds to 49.48% of the Financial Sophistication Index.

Regarding the percentage of the index assigned to the items "Experience in the Sector" and "Experience as CEO", a differentiated treatment was necessary because these are continuous variables. Thus, the percentage of the items was distributed differently between the observations to respect the use of continuous variables and intensify the probability of its use. Experience in years (decades) was used as the parameter, as presented in Table 6.

Table 6

Parameterization of the items "ES" and "ECEO" for ISF

Experience in the Sector														
Decades	Observations						% of observations						% Explained variance	% Explained variance by decades
	2011	2012	2013	2014	2015	Total	2011	2012	2013	2014	2015	Total		
0	3	1	4	5	4	17	2,04%	0,63%	2,42%	2,96%	2,34%	2,10%	13,83%	0,00%
1 – 10	30	31	28	32	38	159	20,41%	19,62%	16,97%	18,93%	22,22%	19,63%		2,77%
11 -20	39	40	43	43	37	202	26,53%	25,32%	26,06%	25,44%	21,64%	24,94%		5,53%
21 – 30	30	35	44	41	41	191	20,41%	22,15%	26,67%	24,26%	23,98%	23,58%		8,30%
31 – 40	30	37	34	33	35	169	20,41%	23,42%	20,61%	19,53%	20,47%	20,86%		11,06%
41 ou +	15	14	12	15	16	72	10,20%	8,86%	7,27%	8,88%	9,36%	8,89%		13,83%
Total	**147**	**158**	**165**	**169**	**171**	**810**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		
Experience as CEO														
Decades	Observations						% of observations						% Explained variance	% Explained variance by decades
	2011	2012	2013	2014	2015	Total	2011	2012	2013	2014	2015	Total		
0	9	13	22	16	21	81	6,12%	8,23%	13,33%	9,47%	12,28%	10,00%	12,27%	0,00%
1 – 10	97	108	106	116	119	546	65,99%	68,35%	64,24%	68,64%	69,59%	67,41%		4,09%
11 -20	20	21	24	26	22	113	13,61%	13,29%	14,55%	15,38%	12,87%	13,95%		8,18%
21 ou +	21	16	13	11	9	70	14,29%	10,13%	7,88%	6,51%	5,26%	8,64%		12,27%
Total	**147**	**158**	**165**	**169**	**171**	**810**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**		

Legend: ES – Experience in the Sector: professional experience (in years) in the same sector as the company in which current works; ECEO –Experience as CEO: Experience (in years) as CEO in the current company; and Financial Sophisticated Index. Table 6 shows that the item "Experience in the Sector" represents 13.83% of the Financial Sophistication Index. Thus, the parameterization of this item redistributed the percentage considering 5 segments. Item "Experience as CEO" represents 12.27% of the Financial Sophistication Index, considering 4 segments of decades. Equation "3" presents the calculation of the Financial Sophistication Index.

Source: developed by the authors.

$$ISF_{i,t} = \frac{\left[(PFI * VFI_{i,t}) + (PFF * VFF_{i,t}) + (PEDF * VEDF_{i,t}) + (PESF * VESF_{i,t}) + (PEI * VEI_{i,t}) + \left(\left(\frac{PER}{5D}\right) * DER_{i,t}\right) + \left(\left(\frac{PECEO}{3D}\right) * DECEO_{i,t}\right)\right]}{100} \quad (3)$$

Where:

- $ISF_{i,t}$ - Financial Sophistication of companyiin yeart;
- PFI - weight International Training;
- $VFI_{i,t}$ - Value of International training of companyiin yeart;
- PFF - weight Financial Training;
- $VFF_{i,t}$ - Value of Financial Training of companyiin yeart;
- $PEDF$ - weight Experience as CFO;
- $VEDF_{i,t}$ - Value of Experience as CFO of company i in yeart;
- $PESF$- weight Experience in the Financial Sector;
- $VESF_{i,t}$ - Value of Experience in the Financial Sector of company iin yeart;
- PEI - weight International Experience;
- $VEI_{i,t}$ - Value International Experienceof company i in year t;
- PER - weight Experience in the Sector;
- $5D5$ - Decades;
- $DER_{i,t}$ - Decades of Experience in the Sectorof company i in year t;
- $PECEO$ - weight Experience as CEO;
- $3D3$ - Decades;
- $DECEO_{i,t}$ - Decades of Experience as CEO of company i in year t.

Equation "3" shows the division of the sum of items by 100 to transform the result in an index between "0" and "1". This way, the Financial Sophistication Indexwas obtained.

4.1 Statistics of the Academic Financial Sophistication Index

TheAcademic Financial Sophistication Index is composed according to the factor 1 loadings (Table 4) and equation "2", considering 100% of the factor's percentage, so that the index presents values between "0" and "1". Regarding the percentage of the index assigned to the item "Experience in the Sector", the same criteria established in Table 6 should be considered. Equation "4" presents the calculation of the Academic Financial Sophistication Index:

$$ISFA_{it} = \frac{\left[\left(PFI * VFI_{it}\right) + \left(PFF * VFF_{it}\right) + \left(\left(\frac{PER}{5D}\right) * DER_{i,t}\right)\right]}{100} \quad (4)$$

Where:

- Academic Financial Sophistication Index of company *i*in year*t*;

4.2 Statistics of the Professional Financial Sophistication Index

The Professional Financial Sophistication Index is composed according to the factor 2 loadings (Table 4) and equation "2", considering 100% of the factor percentage, so that the index presents values between "0" and "1". Regarding the percentage of the index attributed to the item "Experience as CEO", the same criteria established in Table 6 should be considered. Equation "5" presents the calculation of the ProfessionalFinancial Sophistication Index:

$$ISFP_{it} = \frac{\left[\left(PESF * VESF_{i,t}\right) + \left(PEDF * VEDF_{it}\right) + \left(\left(\frac{PECEO}{3D}\right) * DECEO_{i,t}\right) + \left(PEI * VEI_{it}\right)\right]}{100} \quad (5)$$

Where:

- Professional Financial Sophistication Indexof company i in year t;

5. Anticipatingquestions to be investigated

The scientific community in the fields of business administration, accounting, economy, finances, and psychology has increasingly addressed the effect of human capital on decision-making, and consequently, performance (Barzegar & Farjad, 2011; Godoy & D'Amelio, 2012; Grip & Sauermann, 2013; Batalla-Busquets & Martínez-Argüelles, 2014), especially human capital in terms of job positions, such as that of a CEO, who needs to make effective and rapid decisions (Barros, 2005; Faulconbridge*et al*., 2009; Davis *et al*., 2013; Dickel & Moura, 2016; Fran *et al*., 2016; Dauth*et al*., 2017; Gounopoulos & Pham, 2018a; Gounopoulos & Pham, 2018b; Curi & Lozano-Vivas, 2020; Duan et*al*., 2020). Therefore, advancements in the technological field do not replace individuals, as decision-making is a complex and essentially human process; it is a product of individuals' choices and assessments (Tronco, Lobler, Santos & Nishi, 2019). Additionally, a CEO should be able to interact with and influence other top-level directors for management strategies to work (Georgakakis, Heyden, Oehmichen & Ekanayake, 2019). Therefore, management knowledge and experience, especially concerning the areas and processes in business finances, can cause important changes in companies.

Academic knowledge and professional experience in the management field have been the focus of research. Curi and Lozano-Vivas (2020), for instance, analyzed how managerial skills affect risk-taking and also verified the extent to which the vulnerability of an intangible asset, such as managerial skills, is crucial during an economic crisis. Brazil experiences periods of economic turbulence accruing from internal problems, such as political instability, but, because it is an emergent country, crises in other industrialized countries, and mainly in developing with which it has important trade relations, reflect here as well.

This context raises many questions, which could be investigated considering the metric proposed of Financial Sophistication:

- After years of financial crises, both due to exogenous issues, which impact business activities, and endogenous issues concerning financial difficulties, are the replacement of CEOs marked by individuals with higher levels of Financial Sophistication?
- Is there a preference for market analysts recommending the purchase of shares of companies with more financially sophisticated CEOs during and after crises? Given an expectation that s/he re-establish, or even, create an advantage compared to competitors in the sector?
- In timesof economic turbulence reflecting in the stock market, is it possible to perceive stability or even optimism in the stock prices of companies that have a CEO with greater Financial Sophistication?

A CEO's management and international expertise originated from both the academic and professional spheres is also the object of recent studies. However, research is still incipient to use variables that involve CEOs' characteristics and consider them individually. Some examples involve decisions regarding IPO, preparation of the initial disclosing of financial statements, exposure to longevity/perpetuity expectations, and earnings manipulation (Gounopoulos & Pham, 2018a; Duan *et al.*, 2020; Gounopoulos & Pham, 2018b; Kao & Chen, 2020; Jiang, Zhu & Huang, 2013). These issues are especially interesting to consider how they apply in emergent countries according to CEOs' freedom to make decisions, considering that corporate governance may be considerably weaker than in developed countries (Kao & Chen, 2020).

Approximately 36% of IPOs fail within five years (Gounopoulos & Pham, 2018a). Authors state that companies managed by expert CEOs are less likely to fail and are more likely to survive, while managerial skills have important implications on performance after an IPO. In turn, Duan et*al.*(2020) investigated the impact of international knowledge on the decision regarding the place where to launch an IPO. They found that CEOs with international experience are more likely to launch IPOs abroad. Additionally, they suggest that the option to launch stock on the market abroad occurs in countries with more advanced legal standards and for high technological segments. Custódio and Metzger (2014), however, reveal a tendency of more financially sophisticated CEOs (these authors consider experts in the financial field) to be hired by more mature companies, and that previous financial experience contributes to decision-making regarding financial policies (investment and financing). The studies seem to agree that a CEO with financial experience can mitigate information asymmetry when disclosing financial statements (Gounopoulos & Pham, 2018b), which is vital for companies seeking to enter and consolidate themselves in the capital market.

Kao and Chen (2020) report that the intention of launching an IPO is more likely to lead to earnings management, and consequently, decrease R&D expenses to raise profits immediately after the launch. In this sense, Jiang et*al.* (2013), draw attention to the possibility of CEOs with financial experience to have more condition to perform real earnings management (which affect cash flow, discretionary expenses, and production costs), which is more difficult to detect using accounting criteria, that is, accruals. However, the results show that CEOs with financial experience are consistent with the prudence concept and are consistent over time. Gounopoulos and Pham (2018b) also note that CEOs with financial expertise are less likely to manage earnings by accruals or real in the IPO year than those without such expertise. Therefore, they seem to understand the importance of disclosing financial statements and are aware of their role in reducing information asymmetry between companies and investors.

Many corporations in Brazil experience very early delisting. It is not very difficult to find studies in the fields of administration, accounting, and finance using restricted samples because they consider a slightly longer time series. The difficulty of companies to remain active is a gap that deserves greater attention from the scientific community, and the metric proposed here provides an opportunity to understand this context:

- Are companies that go public and are led by a highly Financially Sophisticated CEO more likely to succeed (active and in good financial shape)?
- Does a company, new to the stock market and managed by a Financially Sophisticated CEO, tend to have more investors interested when launching an IPO? And if so, are they able to raise the trading price? The reason would be that investors understand that the CEO's skills and abilities facilitate circumventing newcomers' difficulties and generate better results.
- Can a CEO's Financial Sophistication be a requirement to establish greater confidence in the "agent" and "principal" relationship, establishing legitimacy in the face of the market? The reason would be that the literature reports evidence of fewer earnings management and higher quality statements.

6. Final considerations

This study contributes to the literature in finances because it theoretically grounds the construct "Financial Sophistication", proposing three metrics, and shares recent studies' propositions. Financial Sophistication comprises academic and professional expertise in the finances field, namely: International Training and Financial Training (academic dimension); and Experience in the Sector, Experience in the Financial Sector, Experience as CFO, International Experience, and simultaneously having a top-level position in another company (professional dimension). The three metrics consider the characteristics of academic training and professional experience in the financial field, both separately and in combination, considering potential differences in its empirical application in future studies. By valuing an even greater contribution, this study collaborates to advancement in business administration and accounting by sharing some propositions of recent studies. The continuity of studies in the topic, which may use these propositions, tends to provide greater support to "principals", considering that a CEO's Financial Sophistication tends to impact his/her decisions and reflect on the staff, possibly producing secondary impacts.

Strategic decisions, consequently, business results are influenced by their managers' observable and cognitive characteristics (Hambrick & Mason, 1984; Pereira, Theiss, Lunkes, Schnorrenberger, Gasparetto, 2016). Therefore, investors are interested in understanding how managers' profile affects decision-making and consequently their interest in maximizing wealth. There is much to be addressed in this aspect, considering that the Brazilian stock market is relatively new. The following makes apparent the extent to which operation in the stock market is incipient in Brazil: the first Brazilian stock exchange (Bolsa de Valores do Rio de Janeiro) was created in 1845 (and ended its operations in 1864); there was virtually no capital market from 1930 until practically, the 1960s (especially for long-term operations); while the Securities and Exchange Commission (CVM) was created in 1976 (Galvêas, 2008). From this perspective, it is even more contemporary to consider the personal characteristics of a company's manager to understand the decision-making process and its reflexes. Therefore, the application of this metric, "Financial Sophistication" in the Brazilian context, is an aspect that can be considered and tend to provide meaningful contributions, both to the literature and for shareholders and stakeholders to guide their decisions and maximize their interests.

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The influence of self-esteem and the advisee-advisor relationship on symptoms of the Burnout Syndrome: evidence from graduate Accounting programs in Brazil

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Abstract

Objective: Thisstudy's objective was to analyze the influence of self-esteem and the advisee-advisor relationship on the onset of symptoms of the Burnout Syndrome among students attending graduate Accounting programs in Brazil.

Method: This descriptive study with a quantitative approach was developed as a survey. The instruments used included: Rosenberg Self-Esteem Scale(1965), the MBI-HSS to verify the existence of symptoms of the Burnout Syndrome, and the scale developed by Silva and Vieira (2015) to identify the students' perceptions regarding a good advisee-advisor relationship. The population comprised Master's and doctoral students attending graduate Accounting programs in Brazil. The final sample was composed of 141 valid responses. Data analysis included descriptive analysis, factor analysis, and Structural Equations Modeling to test the hypotheses.

Results: The results indicate a negative influence of self-esteem on symptoms of the Burnout Syndrome. Self-esteem is relevant when dealing with the adversities imposed by a graduate program. Additionally, advisor's accessibility was found to negatively and significantly influence the perceived low efficacy, while good advisee-advisor relationships influence the Exhaustion dimension, suggesting that having a good relationship with advisors prevents the development of symptoms of the Burnout syndrome.

Contributions: This study's contributions include an overview of the perceptions of students regarding their level of self-esteem, advisee-advisor relationship, and symptoms of the Burnout syndrome, all subjects seldom addressed in graduate Accounting programs at a national level. The results also show the importance of promoting good self-esteem in the context of graduate programs to prevent low efficacy, exhaustion, and cynicism.

Keywords: Burnout Syndrome. Self Concept. Advisee-advisor relationship. Education, Graduate. Accounting.

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1. Introduction

Universities play an essential role in human development. Their nature is marked by the dual role of training new generations and producing knowledge (Franco, Longhi& Ramos, 2009). For an individual entering a graduate program, the learning process can be significant in terms of academic training and enable a greater understanding of learning based on one's experiences (Lima & Silva, 2017).

The constant exercise of scrutiny, which is supported by research (Bispo& Santos Junior, 2014) in which discovery occurs as a social institution, and knowledge is guided by need and logic (Pimenta&Anastasiou, 2002), is a conducive habitat to unleashing the strategic power of scientific research (Franco *et al*., 2009). Considering that graduate programs' primary product is research, the volume of studies and respective quality become the leading indicators of performance, both for graduate programs and faculty members and students (Cadez, Dimovski& Groff (2017). Consequently, students are faced with the need to produce research and meet academic expectations, which can become stressors (Voltarelli, 2002). Studies report that graduate students are under constant pressure, having to reconcile the researcher role with their personal activities and deadlines (Duque, Brondani& Luna, 2005; Souza *et al*, 2010).

Research is an activity somewhat exhausting, which allied with pressure imposed by graduate programs and advisors, can make the environment of graduate programs favor the development of the Burnout syndrome (Benevides-Pereira, 2002; Codo, 2002; López, Boluda&Sanden, 2012). However, the literature reports little evidence regarding Burnout syndrome symptoms in the context of graduate programs (Hish, Nagy, Fang, Kelley, Nicchitta, Dzirasa& Rosenthal, 2019).

Burnout syndrome is depressive, in which individuals affected by this disorder feel a lack of motivation and energy and experience physical and emotional exhaustion; thus, lacking the conditions or motivation to perform tasks. The Burnout syndrome development is conditioned to demographic variables, personality traits, and strategies used to cope with difficulties and organizational/professional factors (Kupcewicz&Jozwik, 2020).

Another aspect related to potential fatigue within this academic context is the students' relationship with their advisors. The increased number of graduate programs added, to the already many duties of faculty members, the advisor role(Leite Filho & Martins, 2006). This is a sensitive activity because, in addition to helping students to find a research topic, advisors are required to produce research, meet productivity goals, and establish relationships that surpass that of advisee/advisor, including respect and admiration (Brown & Adkins, 1998; Silva & Vieira, 2015). In some cases, advisors do not have the ability or maturity required, or even good interpersonal skills, which negatively influence the relationship established with advisees (Goldberg, 1980; Silva & Vieira, 2015).

Self-esteem also plays a considerable role in predicting favorable results, with implications for occupational success, interpersonal relationships, and academic performance (Trzesniewski, Donnellan & Robins, 2003). Additionally, the literature indicates a relationship between self-esteem and Burnout syndrome (Masclet&Mineure, 1999).

However, studies addressing Burnout syndrome among graduate students have not achieved a consolidated theory (Silva & Vieira, 2015), including the relationship between self-esteem and Burnout syndrome. Therefore, the following question emerged: **What is the influence of self-esteem and the advisee-advisor relationship on burnout syndrome symptoms among students attending graduate Accounting programs in Brazil?** To answer this question, this study's objective was to analyze the influence of self-esteem and the relationship between advisee and advisor on Burnout syndrome symptoms among students attending graduate Accounting programs in Brazil.

The possibility to provide a theoretical contribution to understanding better how the advisee-advisor relationship is related to the Burnout Syndrome within the field of accounting training justifies this study. Many models and theories are suggested to describe the complex construction of stress throughout decades, including Burnout Syndrome symptoms (Hish, *et al.*, 2019). However, the application of the relationship between Burnout, advisee-advisor relationship, and self-esteem constitutes a gap that requires further research. In practical terms, this study can contribute to graduate programs by envisioning measures intended to promote students' well-being and health and a healthy relationship between advisees and advisors.

2. Theoretical framework

2.1 Burnout syndrome, self-esteem, and advisee-advisor relationship

Burnout is a construct that describes a psychological state that results from inefficacious strategies to deal with lasting stress at work. However, even after more than 25 years of clinical and scientific work, there is no global definition of Burnout (Ekstedt& Fagerberg, 2005). Burnout refers to mental depletion, similar to a fire that extinguishes or a battery that runs out (López *et al.*, 2012). The expression is used as a definition for a state in which an individual reaches his/her limit and, for lacking energy, can no longer perform physically or mentally (Benevides-Pereira, 2002).

In 1969, this term was used to propose "a new organizational structure to contain the psychological phenomenon affecting helping workers" (Benevides-Pereira, 2002, p. 21). However, the studies addressing the Burnout Syndrome gained greater prominencewith the papers byFreudenberger(1975).

Individuals affected by Burnout Syndrome experience a lack of energy as a response to the stress faced in the workplace (Zuluaga&Moreno, 2012). Individuals may also experience emotional exhaustion, depersonalization and low professional achievement (Fuente, San Luis, Lozano, Vargas, García&Emilia, 2014).

This syndrome is cumulative and develops gradually. It appears at different levels, and the following symptoms stand out: irritation, restlessness, frustration, and exhaustion (Mallmann, Palazzo, Carlotto&de Castro Aerts, 2009). The symptoms may progress from sporadic to permanent and favor the onset of physical diseases and symptoms.

It is "a syndrome through which workers lose the meaning of their relationship with their jobs [...] it primarily affects professionals from the education and health fields when directly dealing with users" (Codo, 2002, p. 238). Burnout is a prolonged manifestation of chronic, emotional, or interpersonal stressors (Maslach 1976; Schuster, Dias &Battistella, 2015), and syndrome can be defined according to three dimensions, as presented in Table 1.

Table 1
Dimensions of the Burnout Syndrome

Dimensions	Concept
Efficacy at work	It refers to an individual's expectations toward work, including expectations regarding ongoing accomplishments at work.
Exhaustion	It is associated with excessive workload, extreme depletion, and fatigue, resulting from prolonged involvement with demanding tasks.
Cynicism	It concerns an individual's indifferent and disengaged attitude toward work, lack of enthusiasm, low energy, and decreased professional efficacy.

Source: Schuster *et al*. (2015)

Many factors may lead to the onset of Burnout Syndrome. Initially, it was believed that it only affected individuals managing people, such as in the health, education, and social work fields (Maslach, 1976; Silva & Vieira, 2015). However, studies report it may occur in parents and children's relationships and among students (Maslach 1976; Silva & Vieira, 2015). College students are constantly under pressure to meet academic requirements, making them more prone to experience emotional exhaustion (Li *et al*, 2018).

Self-esteem has been the object of study among workers, students, and faculty members. High levels of self-esteem were found to influence lower levels of Burnout Syndrome symptoms (Leroy-Frémont; Desrumaux&Moundjiegout, 2014; Kang;Twigg&Hertzman, 2010). Hence, low self-esteem may be considered a predictor of Burnout (Johnson *et al*, 2020).

Other studies report a relationship between self-esteem and other aspects. High self-esteem during college education may impact college students' professional characteristics, among which: high salaries, high levels of engagement, job satisfaction, and low levels of exhaustion. On the other hand, low self-esteem during college studies predicted unemployment, exhaustion, cynicism, low levels of achievement at work, and low job satisfaction (Salmela-Aro&Nurmi, 2007).

Self-esteem can also affect performance because more self-assured and capable individuals perform better academically (Polese,Bortoluzzi& Antonelli,2019; Li *et al*, 2018). Unmotivated and disinterested students (low self-esteem) may experience impaired learning and present inferior performances (Alves, 2009; Polese*et al*., 2019), a factor that may lead to Burnout Syndrome.

Note that the literature reports a limiting factor concerning self-esteem from a'cause x effect' perspective. Some studies state that self-esteem is a predictor (Johnson *et al*, 2020; Leroy-Frémont; Desrumaux&Moundjiegout, 2014; Kang; Twigg&Hertzman, 2010), while other studies argue that self-esteem is an effect (Enache, 2013). The first perspective was adopted in this study.

In addition to self-esteem, evidence shows that work demands may also trigger symptoms (Jodas& Haddad, 2009; Moreira, Brito, Obregon, Ribas&Lopes, 2017). Jodasand Haddad (2009) highlight that activities demanding more time than an individual has available may favor the onset of Burnout Syndrome. Moreira, *et al*.(2017) note that educators and their relationships with work may trigger the syndrome due to differences from what is expected and accomplished in a graduate program context. These aspects are related to advisors who are the ones supervising the activities of graduate students.

Students attending graduate programs. i.e., programs that award advanced academic degrees impose demands that can become stressors. Students are expected to develop the researcher role, exclusively dedicate themselves to academic production, and publish papers in high-level journals, often without any financial support. When students failed to meet expectations, they may become frustrated and experience mental and emotional exhaustion as a result (Voltarelli, 2002).

Studies addressing this syndrome among students suggest it may develop during academic life and perpetuate throughout life (Schaufeli, Salanova, González-Romá&Bakker, 2002; Silva & Vieira, 2015). The fact an individual has to reconcile many activities during academic life, doubts regarding professional prospects, and the need to deal with deadlines may trigger the syndrome (Duque, Brondani& Luna, 2005; Souza,Trigueiro, Almeida & Oliveira, 2010).

With the growth of scientific production in the Accounting field, the offering of graduate programs grew as well. Consequently, the production of papers, theses, monographs, and dissertations increased (Leite Filho & Martins, 2006). Given this context, "[...] many professors spontaneously, or forcibly, aggregate the advisor role to their teaching duties"(Martins, 2009; Leite Filho & Martins, 2006).

Advising graduate students is a sensitive task (Brown & Adkins, 1998; Silva & Vieira, 2015) because it goes beyond the search for a research topic. It involves research, productivity, meetings to clarify doubts, and establishing a relationship of respect and admiration. The quality of the relationship established between a student and his/her advisor is one of the primary aspects related to the completion of a graduate program (Blanchard &Haccoun, 2019). The knowledge acquired when working on a dissertation or thesis is a process that builds on a mutual relationship between advisee and advisor (Machado, 2002). Advisors need to be competent to support the students' research and steer them toward knowledge and personal and intellectual development (Silva & Vieira, 2015).

2.2 Hypotheses formulation

First, it is believed that low self-esteem negatively influences the development of Burnout Syndrome. Self-esteem is an assessment of one's worth and the social relationships one established, which may be negative or positive depending on certain behaviors (Rosenberg, 1965; Sedikides; Rudich; Gregg; Kumashiro&Rusbult, 2004; Wagner, Lüdtke; Jonkmann&Trautwein, 2013). One may have lower or higher levels of self-esteem (Silva & Vieira, 2015). Hence, it may comprise personal satisfaction, self-depreciation, self-appreciation, and feelings of failure, among others (Avanci, Assis, Santos & Oliveira, 2007; Polese*et al.*, 2019).

Self-esteem is considered unstable. There may be ups and downs throughout life depending on an individual's experiences (Mosquera&Stobäus, 2006; Polese*et al.*, 2019). There are three levels of self-esteem: low, moderate, and high. Low self-esteem is characterized by feelings of incompetence, maladjustment, and lack of motivation when facing challenges; moderate self-esteem is inconsistent, oscillating between feelings of adequacy and inadequacy; while individuals with high self-esteem feel competent and confident (Polese*et al.*, 2019; Rosenberg, 1965).

In 1965, Rosenberg conducted a study to address self-esteem, *Society andtheAdolescent Self-Image*, which addressed how self-esteem was distributed among groups and the influences an individual receives depending on the group s/he belongs (Rosenberg, 1965). The Rosenberg Self-Esteem Scale(RSES), developed in this study is one of the instruments most frequently used to assess global self-esteem (Romano, Negreiros& Martins, 2007).

Given constant changes, individuals are required to develop sufficient self-esteem to deal with the adversities to which we are all subjected; thus, it is a factor determining success or failure considering that self-esteem is essential to building self-confidence (Branden, 2001). Therefore, the first hypothesis states that:

H1: High self-esteem negatively influences Burnout Syndrome.
The symptoms of Burnout Syndrome were separated to facilitate interpretation of results. Hence:
$H1_A$: High self-esteem negatively influences Low Efficacy.
$H1_B$: High self-esteem negatively influences Exhaustion.
$H1_C$: High self-esteem negatively influences Cynicism.

Therefore, high self-esteem favors lower levels of Burnout Syndrome symptoms, while low self-esteem favors higher levels of Burnout Syndrome symptoms.

In addition to self-esteem, academic stressors may predict Burnout Syndrome (Hish *et al.*, 2019). Another factor that is believed to influence the onset of this syndrome is students' relationship with their advisors; advisors are the guiders of graduate students (Silva & Vieira, 2015).

However, in some instances, this relationship becomes inappropriate if advisors forget or ignore their students' limitations, and for this reason, orientation may lose intensity and quality (Piccinin, 2003). In this sense, Frame and Allen (2002) point out that a successful relationship between advisee-advisor depends on the advisor's accessibility. The support of advisors is critical for students achieving success in higher education studies (Blanchard &Haccoun, 2019).

Dysfunctional relationships involving aspects ranging from an inadequate frequency of meetings to mistreatment are frequently associated with burnout among doctoral students (Hish*et al.*, 2019). Additionally, studies report that dropoutsfrom graduate programs may be linked to advisees experiencing emotional problems and a feeling of helplessness (Carvalho, 1994; Luna, 1983; Sanches, 1992). Given the previous discussion, it is believed that having an accessible advisor may decrease Burnout Syndrome symptoms. Hence, the second hypothesis states that:

H2: Accessible advisors negatively influence Burnout Syndrome

Similar to hypothesis 1, the symptoms were separated to facilitate the interpretation of results. Hence, we have:

H2A: Accessible advisors negatively influence Efficacy.

H2B: Accessible advisors negatively influence Exhaustion.

H2C: Accessible advisors negatively influence Cynicism.

Therefore, accessible advisors lead to lower levels of Burnout Syndrome symptoms while less accessible advisors lead to higher levels of Burnout Syndrome symptoms.

In addition to accessibility, Severino (2009) states that joint work should be enriching and efficacious for both parties, while advisees should neither feel abandoned nor suffocated by advisors. The relationship with one's advisor is another aspect associated with Burnout symptoms (Janikova&Buzgova, 2017; Turnipseed, 1994). From the advisees' perspective, an advisor is a guider (Silva & Vieira, 2015). Both parties should be aware that this is a professional relationship in which knowledge is exchanged (Severino, 2009).

Severino (2009) notes that this process should be free from any form of oppression or submission, benefit both parties, and allow for reciprocal growth and teamwork. Kovach Clark, Murdock, andKoetting (2009) report that having strong support from advisors was negatively related to Burnout among students enrolled in a counseling psychology program.

Therefore, we expect that having a good relationship with advisors negatively influencesBurnout Syndrome symptoms. Hence, the following hypothesis is proposed:

H3: Having a good relationship with advisors negatively influencesBurnout Syndrome symptoms.

The symptoms were also separated for hypothesis 3. Hence we have:

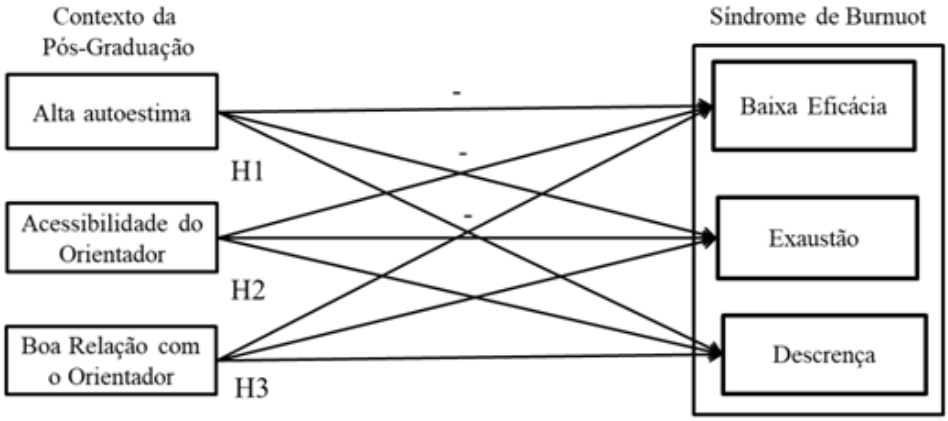
H3A: A good relationship with advisors negatively influences Low Efficacy

H3B: A good relationship with advisors negatively influences Exhaustion

H3C: A good relationship with advisors negatively influences Cynicism.

Hence,a high-quality relationship established between advisee and advisor influences lower levels of Burnout Syndrome symptoms, while low-quality relationships influence higher levels of Burnout Syndrome symptoms.

With the hypotheses established, this study's theoretical model is presented in Figure 1.



Translation: Graduate context: Self-esteem. Advisors' accessibility, Good advisee-advisor relationship. Burnout Syndrome: Low Efficacy, Exhaustion and Cynicism

Figure 1. Theoretical model

After establishing this study's theoretical model, we began the methodological procedures addressing the sample, instrument, and analysis techniques.

3. Methodological Procedures

This descriptive study with a quantitative approach was developed as a survey. Its objective was to analyze the influence of self-esteem, accessibility, and good advisee-advisor relationship on the onset of Burnout Syndrome symptoms among graduateAccounting students in Brazil. The study population is composed of Master's and doctoral students attending Accounting Sciences programs.

The electronic questionnaire was sent to 27 coordinators of graduate programs, who were asked to disseminate it to students. The questionnaire was also sent to emails of the authors' lists of contacts. The statistical power of the sample size was calculated based on the predictor variables concerning the dependent variables. The average effect size, equal to 0.15, sample power of 1-β=0.8, and level of significance, α=0.05 (Faul, Erdfelder, Buchner, & Lang, 2009) were obtained using G*Power. Data were collected between October 2018 and June 2019; a total of 141 valid responses were obtained.

The questionnaire was divided into four sections. The first comprised socioeconomic questions intended to describe the respondents' profile. The second presented the MBI-HSS version adapted by Peleias, Guimarães, Chan and Carlotto (2017). It was used to analyze the existence of Burnout Syndrome signs (Monte, 2005). This instrument comprises 15 items distributed in three dimensions: Efficacy at work – six questions; Emotional Exhaustion – five questions; and Cynicism – four questions. After data were collected, the scores of the questions concerning Efficacy at work were reversed to represent 'Low Efficacy', aligning them with the remaining scale's constructs of Burnout Syndrome for later analysis.

The third section refers to the analysis of self-esteem, and the Brazilian version of the Rosenberg Self-Esteem Scale, translated from *Society and the Adolescent Self-Image*, was used. This is a 10-item instrument (Rosenberg, 1965) with five questions concerning "high self-esteem" and five "Low self-esteem". The questions are rated on a 7-point Likert in which 1 corresponds to "totally disagree" and 7 "totally agree". The scores of the questions concerning 'Low self-esteem' were reversed. The total score ranged from 10 to 70 points, in which scores close to 10 represent low self-esteem and close to 70 represent high self-esteem.

The fourth and last section addresses the advisee-advisor relationship from the perspective of

"advisor's accessibility" and "good advisee-advisor relationship". The questionnaire developed by Silva and Vieira (2015) was used. All the questions, except for Rosenberg Self-Esteem Scale, were rated on a 7-point Likert scale, ranging from 1-Never; 2-Rarely; 3-Sometimes; 4-Half of the time only; 5-Many times; 6-Almost always; and 7-Always.

Descriptive statistics were used to characterize the respondents and their answers. The hypotheses were tested with the Structural Equations Modeling technique, using partial least squares, through Smart PLS 3.Before the Structural Equations Modeling was carried out, the validity and reliability of the measurement model were verified according toHair Jr *et al.* (2014): Average Variance Extracted (AVE) and internal consistency using Cronbach's alpha (CA) and Composite Reliability (CR) (Hair Jr, Hult, Ringle&Sarstedt, 2016; Ringle, Silva &Bido, 2014).

The Structural Equations Modeling technique involves the simultaneous assessment of multiple variables and their relationships (Hair Jr *et al.*, 2016; Ringle *et al.*, 2014). The correlations between the constructs and respective variables were calculated, and then simultaneous linear regressions were performed between the constructs (Hair Jr *et al.*, 2016; Ringle *et al.*, 2014). Boot Strapping (Hair Jr *et al.*, 2016; Ringle *et al.*, 2014) was used to test the hypotheses and verify the significance of the relationships (p-value) between the model's variables.

4. Analysis and Presentation of Results

4.1 Respondents' characterization

First, a profile of the survey's respondents was outlined. Of the 144 questionnaires returned, three were disregarded for not being complete. Hence, the final sample comprised 141 respondents. Most were women (57.4%) aged between 20 and 29 (51.77%). Additionally, the ages 24 and 25 predominated, indicating a small gap between undergraduate studies and the graduate program. Of the 141 students, 51.8%were not in a stable union, and 79.4% did not have children. Most attended a public university (94.3%),and 60.3%were Master's students.

Location was the most relevant factor when choosing a teaching institution (52.5%), followed by public university (48.9%).Both factors are relevant because a graduate program's costs are usually high and may increase if students have to move their residence. Being a renowned institution was also relevant for 43.3% of the participants, while the institution's name and tradition were less important factors, totaling 22%.

4.2 Descriptive Statistics

After characterizing the respondents, their perceptions were measured regarding self-esteem, accessibility, relationship with the advisor, and level of exposure to Burnout Syndrome considering its three dimensions. Table 2 presents the descriptive statistics concerning self-esteem, accessibility, and relationship with the advisor.

Table 2

Descriptive Statistics of Self-Esteem

Frequency of responses							
Self-esteem							
	1	2	3	4	5	6	7
AUT5 –On the whole, I am satisfied with myself.	4,96%	4,96%	9,22%	23,40%	13,48%	31,91%	12,06%
AUT6 –At times I think I am no good at all.	4,26%	6,38%	18,44%	8,51%	27,66%	16,31%	18,44%
AUT1 –I feel that I have several good qualities.	0,00%	5,67%	12,06%	12,06%	34,75%	21,99%	13,48%
AUT2 –I can do things as well as most other people.	0,00%	2,13%	12,77%	10,64%	22,70%	32,62%	19,15%
AUT7 –I feel I do not have much to be proud of.	19,15%	30,50%	23,40%	7,80%	9,93%	7,09%	2,13%
AUT8 –I certainly feel useless at times.	26,24%	21,28%	8,51%	25,53%	6,38%	9,93%	2,13%
AUT3 –I feel that I am a person of worth, at least on an equal plane with others.	0,00%	1,42%	12,77%	12,06%	24,82%	27,66%	21,28%
AUT9 –I wish I could have more respect for myself.	12,06%	25,53%	17,73%	9,22%	10,64%	9,93%	14,89%
AUT10 –All in all, I am inclined to feel that I am a failure.	41,84%	25,53%	15,60%	4,26%	6,38%	3,55%	2,84%
AUT4 –I take a positive attitude toward myself.	0,00%	4,26%	18,44%	9,22%	24,11%	26,24%	17,73%

A high frequency of answers agreeing with the statements was found in the self-esteem dimension, which was intended to measure the individuals' assessment of their worth. Hence, the graduate students considered themselves competent and self-confident, while a belief in their worth as a person and ability to perform tasks stood out. We highlight the importance of high self-esteem, which can help respondents overcome the difficulties imposed by a graduate program. A greater deviation on the positive attitudes toward oneself statement was found. Polese *et al.*, (2019) noted that not having positive attitudes toward oneself might hinder the maintenance of self-esteem since it is not stable and fluctuates according to experiences.

Proceeding with the analysis concerning the students' perceptions regarding their advisors' support, presented in Table 3, the frequency of answers to the dimension advisor's accessibility shows that most students had a positive perception of their advisors' accessibility. The ACE1 and ACE4 statements also evidenced this fact. However, regarding deadlines for advisors to provide feedback, positive responses are less frequent, indicating an aspect that advisors could improve. Hence, similar to the advisor's accessibility dimension, in general, the students very frequently provided positive answers to the statements concerning the good relationship with advisors dimension, which is intended to measure the quality of the relationship, level of respect, admiration, and contribution provided by advisors in graduate accounting programs. These findings show that many graduate students had positive feelings toward the relationship established with their advisors.

Table 3

Descriptive statistics of the advisor's accessibility and good relationship with advisors

	Frequency of answers						
Advisor's accessibility							
ACE1 –My advisor always assists me when I need it.	0,71%	2,84%	12,06%	7,09%	14,18%	25,53%	37,59%
ACE2 - My advisor is concerned with my performance in the program.	4,26%	12,77%	14,89%	7,09%	11,35%	24,11%	25,53%
ACE3 - My advisorquickly answers my requests.	2,13%	7,09%	14,18%	7,09%	20,57%	21,28%	27,66%
ACE4 –I have easy access to my advisor.	0,00%	3,55%	7,09%	5,67%	14,89%	19,15%	49,65%
ACE5 - My advisorgives mefeedbackregarding my work according to established deadlines.	4,26%	9,22%	7,80%	5,67%	12,77%	23,40%	36,88%
Good relationship with advisors							
REL1 –I have a good relationship with my advisor.	0,71%	1,42%	5,67%	6,38%	11,35%	11,35%	63,12%
REL2 - My advisortreats me with respect.	0,00%	0,71%	2,13%	2,84%	4,26%	15,60%	74,47%
REL3 –I consider my advisor a good researcher.	0,71%	2,13%	4,96%	8,51%	13,48%	16,31%	53,90%
REL4 - My advisorhas an appropriate relationship with his/her advisees.	0,00%	2,84%	3,55%	8,51%	10,64%	21,99%	52,48%
REL5 –When I build my career I will always have my advisor as a "model".	6,38%	8,51%	7,09%	9,22%	19,15%	17,02%	32,62%
REL6 –My advisor contributes with ideas for my research.	2,84%	9,22%	8,51%	8,51%	13,48%	23,40%	34,04%
REL7 - My advisorprovides proper guidance to my research.	4,26%	8,51%	7,80%	11,35%	13,48%	19,15%	35,46%
REL8 - My advisormasters the topics of my research.	2,84%	6,38%	12,06%	8,51%	16,31%	23,40%	30,50%
REL9 - My advisor acknowledges my achievements.	3,55%	12,06%	6,38%	4,26%	12,77%	26,24%	34,75%
REL10 - My advisoris excellent.	4,26%	4,26%	8,51%	8,51%	13,48%	23,40%	37,59%
REL11 –I admire my advisor.	1,42%	6,38%	9,93%	7,09%	9,22%	15,60%	50,35%

Among the statements, the frequency of REL2 stands out. It shows that there is a perception that advisors show respect toward the graduate students in the vast majority of the advisee-advisor relationships. In addition to respect, having a good relationship and admiration stand out. As Severino (2009) notes, these are essential aspects considering that advisors guide students during the graduate program. Note that there is a difference in the frequency of answers concerning orientation for research. Even though students have a good relationship with their advisors, part of the respondents perceive that advisors do not contribute enough with ideas for conducting research.

For self-esteem and the dimensions linked to the relationship established with advisors, we highlight the frequency of negative answers, especially regarding the students' perception of the advisors' role. This negative fact is reported in other studies (Kovach *et al.*, 2009; Janikova&Buzgova, 2017) addressing the context of graduate programs. After analyzing the students' perception regarding self-esteem and statements addressing the relationship with advisors, we performed descriptive statistics to characterize the Burnout Syndrome. The results are presented in Table 4.

Table4

Descriptive statistics of the Burnout Syndrome among Master's and doctoral students in the Accounting field

	Frequency of answers						
	1	2	3	4	5	6	7
Efficacy							
EFI1 - Ican solve the problems that emerge in my studies and research.	0,00%	2,13%	12,77%	10,64%	19,86%	39,72%	14,89%
EFI2 –During classes. I feel confident and perform my tasks efficaciously.	2,13%	2,13%	6,38%	15,60%	5,67%	50,35%	17,73%
EFI3 –I consider myself a good student.	0,00%	2,84%	7,09%	10,64%	26,95%	37,59%	14,89%
EFI4 –I feel stimulated when I successfully complete my studies and research goals.	0,00%	4,26%	5,67%	7,09%	14,18%	30,50%	38,30%
EFI5 –I believe I am efficacious in contributing to the classes I attend.	0,00%	4,96%	14,18%	9,22%	31,91%	28,37%	11,35%
Exhaustion							
EXA1 –I feel drained from my studies and research.	1,42%	1,42%	2,84%	13,48%	3,55%	38,30%	39,01%
EXA2 –I feel emotionally drained from my studies and research.	1,42%	5,67%	9,93%	9,93%	7,80%	39,72%	25,53%
EXA 3 –I feel used up at the end of a day I have classes.	2,13%	0,00%	9,93%	20,57%	14,18%	25,53%	27,66%
EXA 4 –I feel fatigued when I get up in the morning and have to face another day at school.	5,67%	2,84%	10,64%	21,28%	8,51%	27,66%	23,40%
EXA 5 –Studying and attending classes is truly a strain for me.	14,18%	7,80%	12,06%	21,28%	7,80%	22,70%	14,18%
Cynicism							
DES1 –I have become less interested in my studies and research.	21,28%	9,93%	12,77%	19,86%	7,80%	20,57%	7,80%
DES2 –I am increasingly less interested in my studies and research since I entered this university.	31,91%	14,89%	9,22%	13,48%	7,80%	14,89%	7,80%
DES3 –I have been more skeptical of my potential and usefulness of my studies and research.	18,44%	15,60%	11,35%	19,86%	8,51%	18,44%	7,80%
DES4 –I question the meaning and relevance of my studies and research.	10,64%	7,80%	13,48%	14,89%	11,35%	20,57%	21,28%

Regarding Efficacy, the dimension that addresses the individuals' perspectives concerning goal attainment, for all statements, most respondents score frequencies above five. It means that most graduate students feel capable and meet their goals within the graduate program. The statements show that most students were motivated and feel confident in performing their tasks. Among the statements, the one with a higher frequency of answers six and seven stands out, as students feel stimulated when they successfully achieve their academic goals. However, despite most answers indicating high efficacy, there is a percentage of answers indicating low efficacy. It suggests that the feeling of efficacy is not widespread, and some students were not meeting their academic goals.

The frequency of answers to the Exhaustion dimension indicates many students showed signs of exhaustion. Even though they were efficacious and met their academic goals, a considerable portion of the students presented fatigue and exhaustion symptoms due to academic demands. Additionally, the frequency of answers reveals that exhaustion is most frequently caused by the studies and research routine than classes.

Among the exhaustion statements, the one "I feel drained from my studies and research" stands out, with 39% of the students reporting they feel drained from academic activities every day and 38.3% feeling drained a few times a week. Even though this exhaustion feeling was frequently reported, considering that the options "always" and "almost always" were checked in EF11, the students feel motivated to attain their studies and research goals despite exhaustion; 36.2% always feel motivated, 29.8% almost always; and 14.2% feel motivated many times.

More frequently than usual, the students checked negative answers for the Cynicism dimension statements, which address indifference and disengagement from work. The DES2 statement stands out. It addresses a lack of interest in studies and research, and 22.69% of the students were totally uninterested, while 21.2% lacked interest half of the time. Note that the statement regarding disbelief on the potential and usefulness of their studies also stands out, representing a concern for students in graduate programs.

The high variability of statements concerning cynicism suggests that some students are indifferent toward their studies and research and the potential and usefulness of their work. This finding is of concern and deserves attention given the importance of graduate studies within the Accounting field.

4.3 Measurement model and hypothesis testing

After descriptive statistics were performed, we proceeded to the exploratory factor analysis, aiming at latent variables inserted later in the structural model. The constructs were validated, except for the self-esteem variable in which scores were added up similar to the Rosenberg Self-Esteem Scale (1965), based on the criteria established by Fávero andBelfiore (2017) and Hair Jr. *et al*. 2016: (i) extraction method of principal component analysis, by Varimax rotation with Kaiser normalization; (ii) analysis of commonalities; (iii) Kaiser-Meyer-Olklin (KMO) test for sampling adequacy; and (iv) Bartlett'sphericity test. Note that all the constructs were validated, and none of the statements were excluded.

Afterward, we assessed the measurement model according to the recommended by Hair Jr *et al.* (2016). Hence, the model's reliability and validity were verified considering convergent validity indexes (AVE), internal consistency (CR and CA), and discriminant validity obtained with the criterion provided by Fornell andLarcker (1981).

Convergent validity is obtained by verifying Average Variance Extracted (AVE), which assesses the extent to which variables are positively correlated with their respective constructs. For this criterion, Hair Jr *et al.* (2016) established that the expected value should be higher than 0.5.

Internal consistency was verified using Cronbach's alpha (CA), which is based on the inter-correlations of variables, and Composite Reliability (CR), which prioritizes variables according to their reliabilities (Hair Jr. *et al.*, 2014). Hence, Cronbach's alpha (CA) and Composite Reliability (CR) were used to verify internal consistency (Ringle*et al.*, 2014). For these criteria, Hair Jr. *et al.* (2014) note that values above 0.7 are considered satisfactory.

As Hair Jr *et al.* (2016) recommended, the criterion provided by Fornell and Larcker (1981) was used to assess discriminant validity, which is intended to verify whether latent variables are independent of each other. The square roots of each construct's AVE values are compared to the correlations between these constructs, considering that the square roots of AVE are higher than the correlations between the constructs (Fornell&Larcker, 1981). Even though the advisor's accessibility and good relationship with advisor variables are close, they are independent. Table 5 presents the assessment of the measurement model.

Table 5
Validation of the measurement model

Variables	Self-esteem	AdvisorAccess	AdvisorRel	Efficacy	Exhaustion	Cynicism
Self-esteem	**1,000**					
AdvisorAccess	0,371	**0,850**				
AdvisorRel	0,310	0,817	**0,833**			
Efficacy	-0,662	-0,372	0,258	**0,747**		
Exhaustion	-0,546	-0,203	-0,243	-0,309	**0,817**	
Cynicism	-0,662	-0,399	-0,381	0,577	0,576	**0,851**
AVE	1,000	0,722	0,694	0,588	0,667	0,724
CR	1,000	0,928	0,961	0,883	0,909	0,913
CA	1,000	0,903	0,955	0,842	0,875	0,872

Nota: AVE: Average Variance Extracted; CR: Composite Reliability; CA: Cronbach's alpha.

The R^2 (Pearson's correlation coefficient) of each construct was verified. It indicates the extent to which the independent variables explain each dependent variable. In Social Sciences, Cohen (1977) classifies the explicative power according to the following: R^2=2%: small effect, R^2=13%, moderate effect, and R^2=26% large effect. Based on Cohen's (1977) effect, the Burnout Syndrome variables presenting high explicative power were Low efficacy with R^2 equal to 0.401, Exhaustion with R^2 equal to 0.311, and Cynicism with R^2 equal to 0.471.

Bootstrapping was used for the hypotheses testing, seeking to analyze the significance of the relationships (p-value) in the structural model, using Pearson's coefficient of determination (Ringle *et al.*, 2014). Table 6 presents the path coefficients, based on data obtained through Bootstrapping.

Table 6
Path coefficients and relationships' significance

Hypotheses	Relationship	Structural coefficient	Standard error	t-value	p-value
H1	Self-esteem -> Low Efficacy	-0,545	0,066	8,286	0,000
	Self-esteem->Exhaustion	-0,541	0,061	8,931	0,000
	Self-esteem->Cynicism	-0,593	0,057	10,317	0,000
H2	Advisor's accessibility -> Low Efficacy	-0,308	0,131	2,352	0,019
	Advisor's accessibility ->Exhaustion	-0,161	0,124	1,295	0,195
	Advisor's accessibility ->Cynicism	-0,072	0,116	0,616	0,538
H3	Good relationship w/advisor -> Low Efficacy	0,169	0,125	1,353	0,176
	Good relationship w/advisor ->Exhaustion	-0,200	0,121	1,649	0,099
	Good relationship w/advisor ->Cynicism	-0,131	0,115	1,135	0,256

Source: study's data (2019).

The hypotheses test showed that, as expected by Hypothesis 1, a negative and significant relationship was found between self-esteem and low efficacy according to the students' perspective. Hence, assessing one's worth may lead to greater efficacy in terms of academic goals during graduate studies; i.e., higher self-esteem leads to a lower perception of low efficacy. This finding among graduate Accounting students corroborates the results reported by de Polese *et al.* (2019), that individuals feel more self-assured when they obtain good academic performance.

Additionally, self-esteem is negatively and significantly related to exhaustion and cynicism. That is, individuals who feel competent and confident less frequently experience Burnout Syndrome and less frequently present overexertion or extreme tiredness, fatigue, or lack of energy and enthusiasm. A higher relationship coefficient was found between self-esteem and cynicism than between low efficacy and exhaustion. It suggests the importance of self-esteem when dealing with the adversities imposed during graduate studies, especially regarding enthusiasm toward the tasks performed during academic training. These results are in line with those reported by Li *et al.* (2018).

Hypothesis 2, however, was partially accepted. A negative and significant relationship was found only between advisor's accessibility and low efficacy. The results indicate that having easy access to advisors influences some students' perception of high efficacy, even though it does not influence low exhaustion or cynicism toward one's potential or studies. These findings are in line with the literature. Hish *et al.* (2019) report that an inadequate frequency of advisors' meetings may be associated with fatigue among graduate students. Considering that advisors' accessibility does not affect cynicism toward studies, a lack of advisor's accessibility was not relevant in discussing indifference among graduate students.

Hypothesis 3 was rejected when a good relationship with advisors and Burnout Syndrome were analyzed. No significant relationships were found between a good relationship with advisors and Burnout Syndrome. There was, however, a negative relationship between a good relationship with advisors and perceived exhaustion, at a 10% of significance. Hence, graduate students enjoying a healthy relationship with their advisors, with respect and admiration, may feel less exhausted toward their studies.

This finding possibly indicates the importance of advisors and their relationship with advisees in favoring students to complete their studies without experiencing fatigue and/or exhaustion. This result corroborates previous studies that indicate the importance of establishing a good relationship with advisees to decrease exhaustion (Janikova&Buzgova, 2017; Kovach *et al.*, 2009).

This study's findings indicate self-esteem is an essential factor in preventing students from reaching the verge of their strengths or surpassing their physical and mental capabilities during graduate studies. Even though studies indicate the importance of students having easy access to advisors and establishing a good relationship, no significant relationships were found between these, except between advisor's accessibility and low efficacy and between good relationship and exhaustion. It is essential to sensitize students and advisors in graduate Accounting programs to keep an environment conducive to high levels of self-esteem and healthy relationships with advisors to avoid disorders of a depressive nature.

5. Final Considerations

Burnout Syndrome is a disorder of a depressive nature with a cumulative and gradual development. An individual affected by this syndrome experiences lack of motivation and energy in response to stress. For graduate students, who are required to simultaneously work as researchers, publish in high-level journals, and teach while also performing other tasks, whether, in the academic or personal sphere, these situations may trigger Burnout Syndrome. Therefore, this study's objective was to analyze whether self-esteem and the relationship established between advisee and advisor influence Burnout Syndrome symptoms among students attending graduate Accounting programs.

This study's results reveal that the students attending graduate programs in the Accounting field present high self-esteem levels. Their responses to the statements show they feel competent and are self-confident. Hence, the respondents' assessment of their self-worth was not harmed because they are facing the challenges imposed by graduate programs, as reported by previous studies (Duque *et al.*, 2005; Souza *et al.*, 2010). Regarding having a good relationship with advisors, an expressive percentage of answers to the statements revealed the students' positive feelings. In addition to respect, having a good relationship and admiration is relevant because advisors guide students during the graduate program.

Regarding Burnout Syndrome aspects, the exhaustion dimension revealed a portion of the respondents were experiencing Burnout; however, a small percentage of students presented this symptom in the low efficacy dimension. The results suggest that graduate students feel capable of performing their duties and have met their academic goals, even though these activities are tiring, as indicated by the exhaustion dimension. In addition to the exhaustion caused by the graduate program, the findings indicate a high number of respondents with symptoms in the cynicism dimension, revealing an indifferent and disengaged attitude toward work. It appears that part of the graduate students is indifferent and skeptical toward their studies, research, potential, and usefulness of their research. This information deserves attention considering the importance of the graduate context in the accounting field at a national level.

The analysis in the test of hypothesis indicates that self-esteem perception is negatively related to Burnout Syndrome. Hence, it is inferred that the individuals' assessment of their worth may lead them to be more efficacious toward their academic goals. This aspect suggests that self-esteem is important when dealing with the adversities presented during graduate studies. Graduate programs are recommended to use incentives and recognition to promote the self-esteem of graduate students during academic studies.

No relationships were found between advisor's accessibility and having a good relationship with advisors with Burnout Syndrome. In turn, a negative and significant relationship was found between accessibility and low efficacy and between a good relationship with advisors and exhaustion. These findings suggest that the graduate students, who consider their advisors accessible and willing to contribute, feel more efficacious. Additionally, those with a positive perception of the relationship established with their advisors, who experience respect and admiration, feel less fatigued from their studies. Therefore, advisors play an important role in their advisees' academic trajectory, which corroborates previous studies' findings.

This study contributes to an overview of the context of Brazilian graduate programs in the Accounting field, regarding the students' perception of their self-esteem, advisor's accessibility and good relationship with advisors, and Burnout Syndrome, a topic seldom addressed in this context. In this sense, this study draws attention to the importance of students keeping a positive outlook of themselves and their social relationships in the graduate context. Studies indicate the gradual development of symptoms of the Burnout Syndrome among students (Hish*et al.*, 2019; Schaufeli *et al.*, 2002; Silva & Vieira, 2015) while symptoms may perpetuate throughout life. Even though no substantial evidence was found in the context of graduate programs in the Accounting field, some answers indicate some students were experiencing low efficacy, exhaustion, and cynicism among some graduate students.

Finally, future studies should include new predicting variables to address Burnout Syndrome symptoms among graduate students in the Accounting field to improve understanding of this subject. Alternative strategies such as interviews and participatory observation, in addition to investigating the perception of advisors, may support advancements in the field. Additionally, identifying Burnout Syndromesymptoms among students from related fields such as other business programs is recommended, considering there is still scarce evidence.

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Current cost per student and academic performance in Brazilian federal universities

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Abstract

Objective: To identify the relationship between the level of current cost per student in federal universities and undergraduate students' academic performance.

Method: The sample comprises data from 62 federal Higher Education Institutions (HEIs) from 2010 to 2019, comprising 428,175 students. Multiple regression with panel data was used. The score obtained in the Enade was adopted as a proxy for the student's academic performance and the HEIs' expenditures were measured through current cost without University Hospital (UH).

Results: No statistically significant relationship was found between current cost per student and academic performance. However, the following sociodemographic variables appear related to student performance: race, sex, age, marital status, maternal education, and income.

Contributions: This study is expected to contribute to the development of public education policies implemented by the Federal Government. Additionally, based on data available, HEIs can identify alternatives to establish policies and decision-making to balance efficiency and efficacy. We consider this study's contribution as no significant relationship was found between current cost and performance. Nonetheless, this study is expected to contribute to society as a means of social control of the level of costs among public HEIs.

Keywords: University spending, Academic performance, Federal public universities.

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1. Introduction

Investment in human assets is paramount for a country's economy. Among the aspects to be invested in human assets is formal education; the higher an individual's education, the more one contributes to economic performance (Schultz, 1960). Such contribution may occur through increased individual productivity or greater chances for individuals to ascend socially (Lins, 2013).

Regarding the Brazilian educational context, Law No. 9,394/96, known as *Lei das Diretrizes e Bases da Educação Nacional* [Law of Guidelines and Bases of National Education], provides in Art. 21 that school education is composed of early childhood education, primary education (including middle school), high school, and higher education. In the last decades, the latter has expanded and gained prominence. According to the 2017 Higher Education Census, conducted by the National Institute of Educational Studies and Research Anísio Teixeira (Inep), private higher education institutions grew 53.1% between 2007 and 2017, while public higher education grew 41.7% in the same period.

Higher education is intended to: i) promote development and scientific studies; ii) train individuals and grant degrees in the most diverse fields; iii) encourage scientific research and investigation; iv) promote the dissemination of knowledge; and v) awaken a desire for constant improvement (Law No. 9,394/96, Art. 43). However, for all these goals to be achieved, the government needs to invest resources in public universities.

One way to determine whether resources invested in universities were efficiently implemented is to analyze students' academic performance. Previous studies discuss the impact of resources on education, especially in primary education. However, this topic is seldom explored among higher education institutions, while results diverge, considering that the relationship between institutional expenditure and student performance is complex (Pike, Smart, Kuh& Hayek, 2006; Dahlvig, Dahlvig & Chatriand, 2020).

According to Hedges, Laine, and Greenwald (1994), universities' expenditure was ignored by the literature as a factor determining students' academic performance. Currently, international studies include the level of resources available for universities as an explanatory variable for student performance (Pike *et al*., 2006; Webber &Ehrenberg, 2010; Pike, Kuh, McCormick, Ethington & Smart, 2011; Powell, Gilleland & Pearson, 2012; Rutherford & Rabovsky, 2014; Hong & Zimmer, 2016; Dahlvig *et al*., 2020).

There is not a consensus in the Brazilian context regarding a direct relationship between educational expenditure and academic performance in higher education. However, there is an indirect positive relationship between the quality of an institution's infrastructure and student performance, considering that the resources invested in a university are essential to improve its physical capital (Barbosa, Freire & , 2011; Ferreira, 2015; Lemos& Miranda, 2015).

In this sense, considering the scarcity of resources available to federal universities and the need of these institutions to fulfill their educational goals, this study aimed to identify the relationship between current cost per student in federal universities and undergraduate student performance.

A university is a social institution and, therefore, expresses the structure and way of functioning of the society as a whole (Chauí, 2003). Hence, this study is justified because it addresses the resources applied in teaching institutions and their reflexes on academic performance and society by verifying whether institutions with higher levels of resources effectively present higher performance. According to Dahlvig *et al*. (2020), institutional choices concerning the investment of resources are correlated to undergraduate students' success and persistence. Additionally, studies analyzing the relationship between how universities spend their resources and how these impact students' trajectory reveal this is a relevant topic considering these institutions' responsibility (Dahlvig *et al*., 2020). Therefore, this study's relevance lies in investigating whether federal universities correctly manage their resources to promote student academic performance.

This study's results are expected to contribute to the development of public education policies on the part of the Federal Government, considering that great effort is expected from these institutions to manage increased resources properly. Additionally, public higher education institutions themselves can identify ways to establish policies and decision-making intended to balance efficiency and efficacy, according to the amount of resources available (Dahlvig *et al*., 2020). Additionally, this study is expected to contribute to society as a means to control and supervise Brazilian public higher education institutions' level of expenditure.

2. Literature Review

2.1 Academic performance and higher education institutions' expenditure

Academic performance can be defined as an assessment of students' performance and development; that is, it is an analysis method that enables appraising how well students achieve academic goals (Braga & Franco, 2004).

In Brazil, measures such as the institution's **Índice** *Geral de Cursos Avaliados (IGC)* **[General Index of Courses] and** *Taxa de Sucesso na Graduação (TSG)* [Undergraduate Success Rate], both at an institutional level or yet, the *Conceito Preliminar de Curso (CPC)* **[Preliminary Program Concept] at the level of specific programs, are intended to assess the quality of higher teaching institutions** (INEP, 2020). Another measure of student performance and institutional performance is the *Exame Nacional de Desempenho dos Estudantes (Enade)* [National Student Performance Exam].

At the national level, the *Sistema Nacional de Avaliação da Educação Superior (Sinaes)* [National Higher Education Assessment System] is intended to assess the quality of education. It annually implements the Enade to assess students according to their respective programs› curricular guidelines (Law No. 10.861/2004). Enade is intended to measure different fields of knowledge by performing triennial evaluations. This examination's objective is to assess specific knowledge regarding the programs' fields, as well as knowledge from other general training fields. The exam includes a questionnaire asking students about their impressions regarding the test, student profile, and a questionnaire directed to the programs' coordinator, intending to assess, among other aspects, whether the program is aligned to its pedagogical project (Law No. 10.861/2004).

Student performance accrues from various aspects directly or indirectly linked to the students' characteristics. The primary aspects influencing student performance include: i) aspects related to the students' individual characteristics such as intelligence, skills, and competence; ii) sociodemographic factors such as age, sex, family income, and whether previous education was obtained from public or private institutions; iii) aspects linked to the university's infrastructure like the quality of the library's collection, and access to the Internet; iv) aspects concerning the quality of teaching such as the faculty members' academic qualification, updated knowledge, and different teaching techniques (Magalhães & Andrade, 2006; Araújo, Camargos, Camargos & Dias, 2013; Miranda, Lemos, Pimenta& Ferreira, 2015).

For a university to maintain an appropriate infrastructure and a qualified faculty body over the years, higher levels of public expenditure with higher education are required. A lack of this increase may result in universities' inferior overall performance and an excessive number of students per classroom. Additionally, students' poor performance also impacts the continuity of programs, possibly leading students to drop out of the program or delay studies, resulting in a feeling of frustration (Fagundes, Luce & Espinar, 2014).

The Brazilian Higher Education Census (INEP, 2017) shows that the offering of graduate programs among federal public universities by 7% from 2014 to 2016. Such a fact highlights the importance of investing in these institutions to maintain the number and quality of programs and student performance.

Data regarding the level of expenditure of Brazilian public universities presented by the World Bank (2017) indicate that students from public universities cost two to three times more than students in private universities. Data provided by the "*Revisão das Despesas Públicas*" [Public Expenditure Review] report shows that from 2013 to 2015, the annual average cost per student in profit and non-profit private universities was approximately R$12,600 and R$14,850, respectively. This report also shows an average of R$40,900 among federal universities. This cost among state universities was R$32,200, while the cost per student in federal institutes was approximately R$27,850. The report also indicates a possibility of limiting the cost per student at the level of expenditure of the most efficient Brazilian universities (Banco Mundial, 2017).

However, public higher education institutions may have expenses that do not apply to private institutions, such as inactive personnel or university hospitals, among others. Additionally, public universities implement research activities, an expense most private universities do not have. According to Moura (2019), more than 95% of the Brazilian scientific production in international centers is performed by public universities. Hence, comparing cost per student within the same group of institutions seems more coherent.

HEIs include several processes that use different resources to fulfill their purposes. These resources are used with material for use and consumption, infrastructure, and labor costs, resulting in knowledge in professional training and scientific and technological production (Reis & Reis, 2013). Therefore, to fulfill its purpose, a higher education institution needs an organizational structure, investments, and maintenance aligned to good resource management to ensure its sustainably and attain academic, economic, and social goals (Reis & Reis, 2013).

Additionally, the resources of public higher education institutions are financed by society through taxes. Hence, the managers of HEIs have the responsibility to allocate resources efficiently and efficaciously to maintain these institutions functioning and fulfilling their commitment to academic and social development (Chiau & Panucci-Filho, 2014).

2.2 Previous studies relate student performance and educational expenditure

Empirical studies seek to investigate the relationship between academic performance and educational expenditure. Pike and Robbins (2019) note that various studies report factors that may be related to student performance such as sex, race, socioeconomic status, high school grades, type of institution (public or private), academic and social engagement, and whether students have a paid job during the undergraduate program. The authors also suggest that the program's duration, the institutions' size (number of students), and whether there is also a Master's or doctoral program may also influence student performance. The studies that stand out in Brazil are listed below.

Barbosa *et al.* (2011) analyzed potential relationships between management indicators and student performance and verified that cost per student, the classification of graduate programs, and an index of the faculty members' qualifications positively influence student performance. However, the authors found that a higher proportion of professors and employees to the number of students does not influence student performance.

Ferreira (2015) identified significant variables explaining the results obtained by Accounting Sciences students in the Enade 2012. The author indicated that mostly the students' characteristics and attitudes determined student performance, and only approximately 10% depended on institutional variables (faculty members and HEI). She also highlights that this may be related to the fact that public institutions perform better in the Enade not merely because of its institutional conditions but mainly because of the profiles of the students entering a public HEI.

Lemos and Miranda (2015) identified which variables influenced student performance based on the Enade issues from 2009 and 2012 of the Accounting Sciences program. The authors highlight that the central aspect in which higher education institutions should invest to obtain better results are: qualification of the faculty body (degree and pedagogical training), infrastructure, and increasing the number of full-time professors.

Rocha and Fontal (2019) assessed the relationships between school costs, the organization of school supply, and the performance of public schools by using the E*xame Nacional do Encino Moderate (Enem)* [National High School Exam]. The authors report a significant oscillation between the units' school costs, with unequal distribution of financial resources. However, school costs provide little explanation to the results obtained by schools in the Enem, indicating signs that a greater amount of resources does not necessarily translate into better results in terms of school performance.

In the international context, Pike *et al*. (2011) emphasize the importance of higher education institutions' accountability in the efficient use of resources to promote the results in terms of student performance. The study addressed data from 171 public higher education institutions in the United States and verified a relationship between education expenditure, student engagement and performance. The results revealed that the level of expenditure was moderately related to students' learning. However, this relationship presented a higher effect among first-year students and a more modest effect among senior students.

Rutherford and Rabovsky (2014) sought to analyze the efficacy of educational policies as a mechanism to improve undergraduate persistence and success in more than 500 American higher education institutions throughout 18 years. The results revealed a negative relationship between the students' race (Afro-American and Hispanic) and student performance.

Hong and Zimmer (2016) assessed the impact of infrastructure expenditure on student performance from 1996 to 2009 among schools located in Michigan, United States, and found that infrastructure expenditure levels influenced student performance. However, the effect is not perceived in the short term; at least four years are needed to observe it.

Pike and Robins (2019) investigated the effect of institutional characteristics, students' characteristics, and institutional expenditure on graduation rates in 326 American higher education institutions from 2002 and 2006. The authors found a positive relationship between expenditure with teaching and the percentage of female students graduating in these institutions. The authors also found a negative relationship between the percentage of Afro-American students and graduation rates.

Dahlvig *et al*. (2020) examined correlations between the expenditure of 135 American higher education institutions and student retention and graduation rates. The results showed that expenditure with the faculty body, with supporting activities (laboratory maintenance, library, and administrative expenditure), and research, were highly correlated to graduation rates.

Note, however, that there is not a consensus in neither the Brazilian or international literature regarding the role of expenditure on undergraduate student performance. Therefore, this study aimed to contribute to the discussion on the topic, presenting new evidence regarding the relationship between current cost per student and student performance. Thus, given the discussion above considering previous studies, the following hypothesis is proposed:

H1: Public universities with higher current costs per student tend to perform better in the Enade.

Even though the studies indicate that social factors tend to influence student performance more strongly, this hypothesis is expected to be confirmed due to the importance of investing resources in maintaining a university's activities to achieve higher levels of student performance.

3. Methodology

According to this study's objective, it classifies as a descriptive study. Regarding the procedures used, this study classifies as documentary research (Martins &Theóphilo, 2009), considering that secondary data were used. Also, a quantitative approach was adopted, and statistical methods were used to develop the econometric models.

Considering that various factors influence student performance, an exact measure can hardly be established. For this reason, a proxy is needed for analysis (Miranda *et al.*, 2015). Therefore, the scores obtained by students in the Enade were used here to measure student performance, and the responses provided to the questionnaire were used to characterize the sociodemographic profile of students from Brazilian federal universities.

The sample was composed of the annual data of 62 Brazilian federal universities from 2010 and 2019. Data concerning the students' performance and sociodemographic profile are provided by the Enade reports available on the Inep website. Data were treated using Excel. Students who did take the test, did not obtain a valid result, did not answer the sociodemographic questionnaire or obtained a grade equal to zero were excluded from the sample. Hence, data represent the responses of 428,175 students who took the test in the period of analysis. Data concerning current costs (without a UH) per equivalent student were collected from the HEIs' annual reports available at the Federal Court of Accounts (TCU) website. Due to the effect of inflation in annual current costs, the variable current costs without UH were deflated according to the *Índice Nacional de Preçosao Consumidor Amplo (IPCA)* [Broad National Consumer Price Index]. This index was chosen because it comprises a more significant portion of the population, showing variation on the average living costs of families with a monthly income from 1 to 40 times minimum wage (IBGE, 2020). IPCA related data were collected from the IBGE website.

Data analysis included descriptive statistics to verify the mean, standard deviation, and coefficient of correlation of undergraduate student performance, and mainly of the resources invested in federal public universities to analyze whether there is considerable discrepancy among Brazilian universities' expenditures.

The standard index technique was used to verify the level of resources used by HEIs and the performance obtained in the Enade to compare the results of a given institution with the others' standards, verifying whether the institution is above, at the same, or below the standards of the category to which it belongs (Matarazzo, 2008). The quartiles for student performance were divided into 1st quartile: unsatisfactory; 2nd quartile: regular; 3rd quartile: good; and 4th quartile: excellent. The quartiles for the variable current cost without UH per equivalent student were distributed as 1st quartile: very low; 2nd quartile: low; 3rd quartile: moderate; and 4th quartile: high.

Finally, multiple regression analysis with panel data was performed to verify the impact of the universities' expenditures on the students' academic performance. Additionally, control variables that characterize the sociodemographic profile of senior students from federal universities who took the Enade in the period under analysis were considered. The variables employed in the model, as well as respective proxies, are described in Figure 1. The model was estimated using STATA.

Groups	Variables	Proxies
1. University performance at ENADE	Dependent Variable (ENADE)	Simple mean scores obtaining by graduating students in the ENADE
2. Current cost without university hospital per student	Current cost (COSTS)	Current cost without university hospital (deflated according to the IPCA) divided by the number of equivalent students.
3. Control variables	Age (AGE)	The average age of students (in years) when they took the ENADE
	Students' sex (SEXFEM)	Percentage of female students graduating from college.
	Marital Status (SINGLE)	Percentage of students reporting being single out of the institution's total number of students who took the ENADE
	Students according to race (RACE)	Percentage of race of the university's total number of students who took the ENADE.
	Maternal education/high school (HIGHSCHOOL) Maternal education/college degree (COLLEGE)	The proportion of graduating students allocated according to the following maternal educational levels: complete high school, but did not finish college (HIGHSHOOL); college degree (COLLEGE).
	Students' family income (INCOMEUP1.5) Students' family income (INCOME1.5TO3) Students' family income (INCOME3TO4.5) Students' family income	The proportion of students graduating from college with a family income classified according to the following: Up to 1.5 times the minimum wage (MW) (INCOMEUP1.5); from 1.5 to 3 times the MW (INCOME1.5TO3); from 3 to 4.5 times the MW (INCOME3TO4.5); from 4.5 to 6 times the MW (RENDA4.5TO6)

Figure 1. Description of the variables used in the regression models

Source: adapted from Rocha and Funchal (2019).

According to Pike *et al.* (2011), regarding university expenditure at the institutional level, many attributes, such as educational expenses, are positively related to student engagement and learning. Additionally, Hong and Zimmer (2016) highlight that teaching institutions with higher costs can provide safer, cleaner, more spacious, and well-lit facilities, which favor concentration and promote greater commitment and disposition among students and professors. The authors also mention that professors value institutions with better facilities so that these institutions would hire the best professors, which in turn, contribute to student performance. Hence, an institution's total cost is expected to be positively correlated with student performance.

Note that current costs without UH per student are used as a proxy for resources spent in the university (Figure 2). The explanation is that this indicator considers current expenses (maintenance and functioning) of all managing units, representing the volume of financial resources applied in federal universities to generate teaching, research, and extension activities. Therefore, capital expenditures were not considered, as these generate benefits in the long term, impacting future students' performance.

CURRENT COSTS WITHOUT UH (UNIVERSITY HOSPITAL)
(+) University's current costs within all management units, including university hospitals, if any
(-) 100% of total current expenses of university hospital(s) and maternity hospital(s)
(-) Retirements and Reforms of the University
(-) University's pensions
(-) University's legal actions
(-) Expenses with assigned staff–University's faculty members
(-) Expenses with assigned staff– University's technical-administrative staff
(-) Expenses with professors on leave (e.g., visiting universities abroad)
(-) Expenses with technical-administrative staff on leave (abroad)

Figure 2. Formula of current cost without HU

Source: adapted from TCU (2010).

Regarding the age variable, a positive relationship is expected between age and performance, considering that older students tend to perform better in the Enade (Santos, 2012). Additionally, Eikner and Montondon (2006) state that age is a maturity indicator. Thus, older students would concentrate better, and consequently, perform better than younger students. The authors believe that older students have accumulated prior knowledge and can relate it to the knowledge acquired during undergraduate studies, which can impact the results of academic tests.

Concerning race, Ferreira (2015) stresses that it impacts student performance when a country does not enable all races to access education equally. Brazil fits this profile as there is a predominance of Caucasians with a college degree or attending an undergraduate program. Therefore, Caucasian students are expected to perform better than students from other races.

The educational level of a student's mother can also influence student performance. According to Bandeira, Rocha, Freitas, Del Prette, and Del Prette (2006), the parents' education can be considered an indicator of social status, as families with higher incomes are more likely to invest in education and improve their educational levels. Consequently, parents with undergraduate or graduate studies are more capable of advising their children to pursue higher education and dedicate themselves the best they can.

Regarding marital status, Ferreira (2015) highlights that single students tend to perform better than married students, while Santos (2012) reports a negative relationship between being single and academic performance. She notes that single students may make choices that restrict their time available to studies due to their maturity level compared to married students. On the other hand, Andrade and Corrar (2008) found that single studies perform better than married students, while Masasi (2012) reports that marital status does not influence student performance. Thus, as Miranda *et al*. (2015) noted, results regarding the relationship between marital status and student performance diverge.

Regarding family income, Santos (2012) argues that higher income levels impact performance. Additionally, as the students' income increases, their performance also improves. Ferreira (2015) suggests that students with high family income levels tend to perform better than students with lower family income levels.

Regarding sex, Rangel and Miranda (2016) and Pike and Robins (2019) indicate that female students tend to perform better than male students. Brandão, Silva and Loureiro (2017) note that women seek to facilitate their academic performance as a strategy to deal with a context of gender inequality. The authors also note that this fact occurs in undergraduate programs in human, exact, and biological sciences.

Considering the variables proposed here, multiple regression with panel data is represented by 1:

$$ENADE_{it} = \beta_0 + \beta_1 COSTS_{it} + \beta_2 AGE_{it} + \beta_3 SEXFEM_{it} + \beta_4 SINGLE_{it} + \beta_5 RACE_{it} + \beta_6 EDUCATION_{it} + \beta_7 INCOME_{it} + u_i + \varepsilon_{it} \quad (1)$$

Were:

- $ENADE_{it}$: model's dependent variable;
- β_0 : regression's slope coefficient;
- $CUSTOS_{it}$: current cost without UH of university *i* at time *t*;
- $IDADE_{it}$: age of students from university *i* at time *t*;
- $SEXFEM_{it}$: female students from university *i* at time *t*;
- $SOLTEIRO_{it}$: : single students from university *i* at time *t*;
- $RAÇA_{it}$: race of students from university *i* at time *t*;
- $ESCOLARIDADE_{it}$: Education of mothers of students from university *i* at time *t*;
- $RENDA_{it}$: family income of students from university *i* at time *t*;
- u_i : specific non-observable individual effect (fixed effects error); and
- ε_{it} : usual regression error.

Some tests were run after estimating the pooled model to verify the model's adequacy. First, the Variance Inflation Factor (VIF) was used to assess multicollinearity between the explanatory variables used in the model. Then, the model's functional form was verified using the Ramsey test, as known as RESET. Finally, the Doornik-Hansen test assessed residual normality, in which the null hypothesis assumes that residuals are normally distributed.

Afterward, tests were performed to select the most suitable panel data model for this study: the Chow, Breusch-Pagan, and Hausman tests. After determining the best model, autocorrelation and heteroscedasticity were assessed using the Wooldridge test, which admits as a null hypothesis the non-existence of first-order autocorrelation and likelihood ratio, with H0 that errors are homoscedastic.

Regarding the treatment of outliers, the winsorization technique was applied, in which outliers are not excluded; instead, they have their values replaced by the last acceptable value within the acceptance region. Hence, very small values are replaced by the smallest value not considered an outlier, and very high values are replaced by the highest value not considered an outlier.

4. Results

4.1 Descriptive Statistics

To characterize the sample, the database was divided according to the fields of knowledge evaluated. The entire data represent the three groups of the Enade's evaluation cycles, according to fields of knowledge. According to Table 1, the most representative group in the sample was undergraduate programs (bachelor's degree) in exact sciences, related areas, and teaching programs, totaling 210,596 students. The expressive number of students in this group is possibly due to the scope of the programs within this group and because the teaching programs from the HEIs addressed here offer many slots.

Table 1

Students according to the groups assessed in the ENADE from 2010 to 2019

ENADE assessment group	Total students per group
Bachelor's degree in the fields of Health, Agricultural and related fields (years included in the sample: 2010, 2013, 2016,and 2019)	121.595
Bachelor's degree in Exact sciences and related fields, and teaching program (years included in the sample: 2011, 2014,and 2017)	210.569
Bachelor's degree in Applied Social Sciences, Human sciences and related fields (years included in the sample: 2012, 2015, and 2018)	96.011
Total	**428.175**

Source: Study's data.

Analysis of the variable current cost without HU per equivalent student (see Figure 3) showed that, on average, the current cost per student was higher among the HEIs located in the south. The highest mean in the period analyzed was found in 2013 (R$16,729.01). Additionally, the actual current cost per student (deflated) has decreased over the years. In 2010, the mean cost per student totaled R$14,087.04, and an expressive drop was verified from 2014 on, reaching R$6,785.55 in 2019. The decrease in cost per student may be related to an increase in the number of undergraduate students. This fact also indicates that investment in higher public education has decreased in Brazil and does not accompany the growth in the number of students attending higher education programs.

Another potential reason for decreased costs per student is Constitutional Amendment No. 95/2016, which sets limits on the Federal Budget and Social Security Budget expenditure. Oliveira, Correa, Alencar, Crisóstomo, and Catrib (2018) stress that the expenditure correction rule, based on the total of paid expenses in the year before corrected according to the IPCA in the period, make HEIs operations unfeasible in the short term. Projections for the years between 2018 and 2022 indicate that, due to the growth in personnel expenses, the limits established by the amendment would not even allow recomposing the inflation of the period for the costing and investment expenses. Hence, as shown in Figure 3, the downward trend in costs per student may continue in the coming years, impacting the quality of federal higher education in Brazil.

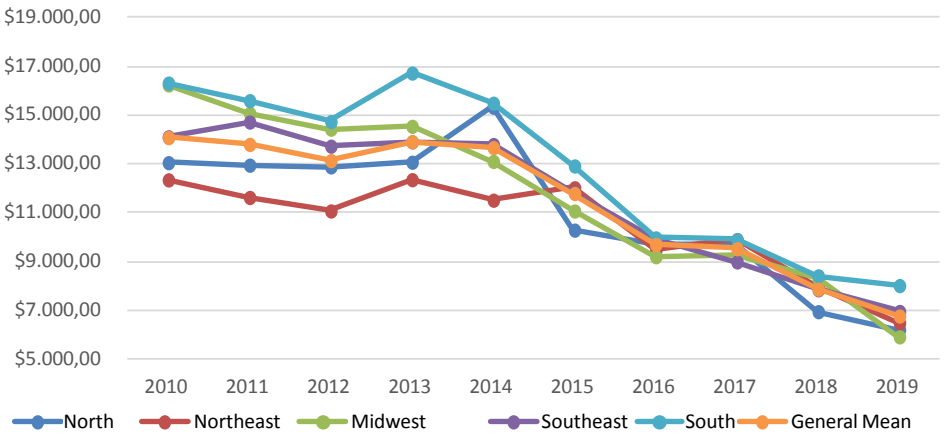

Figure3. Development of current costwithout UH per equivalent student

Source: study's data.

To characterize the Brazilian universities' profile in the sample, Table 2 presents the descriptive statistics of the variables proposed for the panel data model, comprising from 2010 to 2019 for the 62 HEIs. Note that not all the HEIs presented data for the entire period, which resulted in unbalanced panel data. The data shown represent the results after adjusting the outliers using the windsorization technique.

First, the model's dependent variable, measured by the students' mean score in the Enade (according to each HEI), was analyzed. On average, the students scored 51.01 points in the Enade; data dispersion was low, with a variation coefficient of 11%. Considering that the maximum score is 100 points, the students obtained low scores, representing only 51% of the exam's total score. Even the highest mean score obtained in the Enade (68.77) cannot be considered high.

Regarding current costs without UH per student, a mean of R$11,109.93 was found. Therefore, each student would cost this amount per year on average, while this figure does not consider the costs with university hospitals, retirements, or pensions, according to the variable's description. Also, the costs were deflated according to the IPCA to reflect the actual value of costs over the years. Note that the cost per student obtained a higher standard deviation, showing federal universities with distinct levels of cost per student.

Regarding the students' age, the highest mean was 26 years old, while 58% were female students and 42% were male. Historically, most undergraduate students were men. However, this profile has changed, and women are gaining space in universities. In the last decade, women's representativeness in universities has been as high as men's (Gil, 2018). Hence, the cultural paradigm that women should be restricted to specific spaces is being broken over the years, as they have gradually entered the most diverse social contexts. From the observation that most of the sample in this study is composed of women, it becomes evident the female historical trajectory in achieving equal rights and successfully put these rights into practice.

Table 2
Descriptive statistics of variables, data from 2010 to 2019

Variable	Obs.	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
University performance (ENADE)	558	51,01	5,51	0,11	41,29	60,71
Current cost w/o UH (COST)	558	R$ 11.109,93	R$ 3.403,31	0,31	R$ 5.932,02	R$ 18.966,59
Age (AGE)	558	26,14	1,60	0,06	23,85	29,68
Female (SEXFEM)	558	0,58	0,09	0,16	0,41	0,75
Marital status Single (SINGLE)	558	0,84	0,09	0,10	0,65	0,93
Race (CAUCASIAN)	558	0,54	0,23	0,42	0,04	0,96
Race (AFRO)	558	0,08	0,05	0,64	0,01	0,23
Mother's education (HIGHSCHOOL)	558	0,34	0,05	0,14	0,25	0,43
Mother's education (COLLEGE)	558	0,22	0,08	0,34	0,10	0,36
Income (INCOMEUP1.5)	558	0,17	0,10	0,56	0,04	0,39
Income (INCOME1.5TO3)	558	0,23	0,07	0,31	0,10	0,36
Income (INCOME3TO4.5)	558	0,17	0,04	0,21	0,10	0,24
Income (INCOME4.5TO6)	558	0,12	0,03	0,27	0,06	0,18

Source: study's data.

Regarding the student's marital status, 84% of the sample was single, and 11.7% was married. Other statuses such as separated, divorced, or widowed totaled 4.3%. The expressive number of single students is since most students were young, as many entered the university immediately after concluding high school.

Concerning the students' race, the highest mean of self-report race was Caucasian, with 54% of the students, followed by mixed-race students, with 33%. Those who self-reported being Afro-Brazilians totaled 8.7%. Students who self-reported being Asian or Indigenous or did not report their race totaled approximately 4.3%.

Additionally, the analysis of the three groups of knowledge fields evaluated in the Enade shows that Caucasian students stood out in the 2010 to 2012 period, with 60.7%, followed by mixed-race students with 30%, and Afro-Brazilians with 6.78%. In the 2017 to 2019 period, Caucasian students totaled 48.05%, mixed-race 35.17%, and Afro-Brazilians 10.66%. Hence, the percentage of Caucasian students decreased in the period under analysis while Afro-Brazilian and mixed-race students increased. It may represent a trend of greater diversity and the potential positive effect of affirmative action policies on students' profiles from federal public universities.

This observation is aligned with affirmative action policies for adopting quotas to admit undergraduate students in federal public universities, which considers the students' ethnic-racial origin, income, and whether the candidate studied in a public high school. Given this context, Law No. 12,711, from August 29th, 2012, and later Law 13,409, from December 28th, 2016, which ensures that 50% of the slots per program and period in federal universities and federal institutes in the fields of education, science, and technology are subdivided into half for students from public schools with a gross family income equal to or below 1.5 times the minimum wage *per capita,* and a half for students with a gross family income above 1.5 times the minimum wage. In both cases, a minimum percentage that corresponds to the sum of Afro-Brazilian, mixed-race and Indigenous students, according to the last demographic census reported by the Brazilian Institute of Geographic and Statistics (IBGE), is also considered.

In 2018, according to the IBGE (2019), 50.3% of the undergraduate students reported being Afro-Brazilians or of mixed-race, which shows the potential results from affirmative actions, even though Afro-Brazilian and mixed-race individuals are still underrepresented, as they compose 55.8% of the population (IBGE, 2019). Therefore, public policies directed explicitly to groups historically and socially excluded due to some characteristics should be valued because these aspects are an integrating part of our society.

Regarding the relationship with maternal education, the largest portion of students reported that their mothers had completed high school (34%), followed by college (22%). Regarding the students' income, most students (23%) reported from 1.5 to 3 times the minimum wage, 17% reported up to 1 time the minimum wage, and another 17% reported from 3 to 4.5 times the minimum wage. The group with a family income from 4.5 to 6 times the minimum wage totaled 12% of the sample. The analysis of students classified according to each level of family income shows that students with a family income up to 1.5 times the minimum wage represented 14.92% of the students from 2010 to 2012, and those with an income from 1.5 to 3 times the minimum wage totaled 20.39%. Together, these students represented 35.31% of the students that took the Enade. From 2017 to 2019, this group grew to 47.17%, while 22.2% of these reported up to 1.5 times the minimum wage, and 24.79% reported an income from 1.5 and 3 times the minimum wage. Hence, there was an increase in the number of students with a family income of up to 3 times the minimum wage in the period. As it happened with race, these results may reflect affirmative action policies adopted by HEIs to include students with a low family income in higher education programs.

Descriptive statistics showed that most of the students from federal public universities who took the Enade from 2010 to 2019 were Caucasian, young, single, female, whose mother concluded high school, and with a family income from 1.5 to 3 times the minimum wage. The analysis also revealed that HEIs should implement policies to improve the students' scores obtained in the Enade, encouraging and sensitizing students to the importance of this examination, which they often considered irrelevant. Additionally, although the percentage of Afro-Brazilian students increased in HEIs, this figure is still low compared to Caucasian and mixed-race students, reinforcing the need for affirmative actions to promote access to Afro-Brazilian students in higher education programs.

4.2 Standard index analysis of performance and current cost without UH

The mean of the data observed in each HEIs concerning the scores the students obtained in the Enade (performance) and those concerning total current cost without UH per student was used for the standard index analysis. The HEIs were classified according to the students' performance as excellent, good, regular, or satisfactory. The total current cost without UH was classified as high, moderate, low, and very low. Note that data are deflated.

As shown in Figure 4, the HEIs with excellent performance did not present a uniform behavior regarding the level of costs. For instance, UFCSPA, which presented the highest performance in the sample, showed a very low cost per student. In turn, UFTM and UFRGS, which also presented excellent performance, showed different levels of costs, high and moderate, respectively. Dispersed costs were presented by the remaining HEIs that presented excellent performance; six (37.5%) out of the 16 HEIs classified in this group presented a very low cost per student.

The universities' level of costs with good performance was not constant; 33.3% presented a high level of costs, 20% moderate level, 33.3% presented a low level, and 13.3% presented a very low level of costs.

A low level of costs per student predominated in the group of institutions with regular performance (33.3% of the HEIs in this group); the remaining HEIs represented 26.4% in each of the high and moderate levels, and 13.3 were classified at a low level.

Regarding the HEIs with unsatisfactory performance, a very low level of cost per student predominated, representing 37.5% of the 17 HEIs in this group. Additionally, the group included 18.8% of the HEIs with a high level of cost, 31.2% with regular, and 12.5% with a low level of cost per student.

IES	Performance	Cost per student	HEIs	Cost per student	Cost per student
	Classification	Classification		Classification	Classification
UFCSPA	Excellent	Very low	UFES	Regular	Low
UFTM	Excellent	High	FURG	Regular	Low
UFRGS	Excellent	Moderate	UFF	Regular	High
UFMG	Excellent	Low	UFVJM	Regular	Low
UNB	Excellent	High	UFCG	Regular	Moderate
UFABC	Excellent	High	UFRRJ	Regular	High
UFJF	Excellent	Moderate	UFMT	Regular	Moderate
UNIRIO	Excellent	Low	UFOB	Regular	High
UFSCAR	Excellent	Moderate	UFPB	Regular	Moderate
UNIFEI	Excellent	Low	UFERSA	Regular	Very low
UFV	Excellent	High	UFMS	Regular	Low
UFLA	Excellent	Very low	UNIR	Regular	Moderate
UFC	Excellent	Very low	UNIPAMPA	Regular	High
UFPR	Excellent	Very low	UFGE	Regular	Low
UFCA	Excellent	Very low	UFS	Regular	Very low
UNIVASF	Excellent	Very low	UFRB	Unsatisfactory	Moderate
UFOP	Good	Low	UFRR	Unsatisfactory	High
UFBA	Good	Very low	UFAM	Unsatisfactory	Very low
UFSM	Good	Moderate	UFRPE	Unsatisfactory	Moderate
UFRN	Good	Moderate	UFPI	Unsatisfactory	Very low
UFFS	Good	High	UNILAB	Unsatisfactory	High
UTFPR	Good	Low	UNIFAP	Unsatisfactory	Moderate
UFSC	Good	Moderate	UFPA	Unsatisfactory	Very low
UFRJ	Good	High	UFAC	Unsatisfactory	Very low
UNIFAL	Good	Very low	UFAL	Unsatisfactory	Very low
UFPE	Good	Low	UFRA	Unsatisfactory	Low
UNIFESP	Good	High	UFT	Unsatisfactory	Low
UFG	Good	Low	UNIFESSPA	Unsatisfactory	Moderate
UFU	Good	Low	UFSJ	Unsatisfactory	Very low
UFPEL	Good	High	UNILA	Unsatisfactory	High
UFMA	Good	High	UFOPA	Unsatisfactory	Moderate

Figure 4. Classification of standard index according to performance and current cost without UH per student
Note**:** data from 2010 to 2019.

Source: study's data

Data from Figure 4 were aggregated for analysis and interpretation, but analysis of the database considering performance obtained in each year and current cost per student showed that the university that obtained the best score was the Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA), with a mean score of 69 points in 2018, in which this HEI had a current cost of R$7,477.96.

On the other hand, the worst score among the HEIs was obtained by the Universidade Federal da Integração Latino-Americana (Unila) in 2015, with a mean of approximately 28 points. Note that, even though it obtained the worst score in the Enade among the universities in the sample, in the same year, Unila had a current cost without UH per student of R$19,452.96. The high level of costs per student may be explained by the low number of students enrolled in this university, as this HEI was funded in 2010, which would explain the low number of students, which in 2015 totaled only 870 students.

According to the standard index analysis, the behavior between performance and level of cost per student was not homogeneous despite some standouts. Most of the HEIs classified with unsatisfactory performance in the Enade presented a very low level of cost per student. However, even though HEIs with excellent performance were expected to present a higher level of costs, a low level of cost per student prevailed in this group. It may be related to the fact that these HEIs presented the best performance in the Enade, not only due to their institutional conditions but also due to the profile of their students (Ferreira, 2015). Other factors could also be related to levels of costs and performance, such as efficient management and application of resources or even students' engagement when taking the examination.

4.3 Empirical regression model with panel data

The first step to specify the regression model with panel data was to perform adequacy tests according to the Ordinary Least Squares (OLS) model. Multicollinearity was within the parameters accepted by Hair, Anderson, and Tatham (2005), from 1 to 5, i.e., moderate collinearity. The RESET and normality tests indicated that the functional form was incorrect or some relevant variable was missing, and also that the distribution of the residuals was not normal. However, the model is suitable for interpretation; since it is a model, there is no way to capture all the variables that impact undergraduate student performance. Regarding the normality of residuals, the central limit theorem was assumed, which establishes that data tend to normality at the limit.

Afterward, tests were performed to verify which model would be the most suitable for the sample: pooled, fixed effect, or random effects. The best model was the fixed effects. Subsequently, the tests confirmed the existence of heteroscedasticity and autocorrelation. Hence, the regression model with panel data was estimated with fixed effects, considering the existence of heteroscedasticity and autocorrelation by generalized least squares (GLS). The results found in the tests and the estimated model are presented in Table 3.

The variable of interest in this study, the costs of the universities measured according to current cost without UH per equivalent student (COSTS), was not statistically significant, indicating that student performance is not related to current costs of the HEIs included in the sample. The result found diverge from the relationship expected and from the results reported by Dahlvig *et al.* (2020), Rutherford and Rabovsky (2014), Pike *et al.* (2011) and Pike and Robbins (2019), in which a positive effect was found in relation to the level of expenses. Barbosa *et al.* (2011) found similar results in Brazil, i.e., a positive relationship between student performance in the Enade and cost per student. However, this study's results are in line with those reported by Rocha and Funchal (2019), in which no statistical significance was found between student performance and public expenditure, though in this case the analysis concerned the expenditure of high schools. Additionally, Hong and Zimmer (2016) highlight that an increase in the level of expenses has the potential to improve student performance, although this effect would not be observed in the short term. The authors suggest that the benefits of these expenses are perceived only after four years.

Regarding control variables, considering a level of significance at 5%, the variables age, female, marital status single, Caucasian, and income from 1.5 to 3 times the minimum wage were significant to explain performance. Age presented a positive coefficient of 1.33, showing that older students tend to perform better in the Enade, confirming the relationship expected in this study. Santos (2012) also found a positive result between age and performance in the Enade. A potential explanation for this result is that older individuals usually have accumulated previous knowledge or even experience and are more committed to examinations.

Regarding the students' sex, the literature shows that women perform better than men on average (Rangel & Miranda, 2016; Pike & Robins, 2019). This study is in line with the literature, showing that the higher the number of women taking the test, the higher the university's mean score; if 100% of the women were women, the mean score would increase by 23 points. This finding corroborates the study by Pike and Robbins (2019), in which a positive relationship was found between the percentage of female students and their performance in undergraduate programs. However, it differs from the study reported by Ferreira (2015), in which men performed better in the Enade, though she only addressed Accounting programs.

Regarding the students' marital status, the results indicate a positive and significant relationship with student performance, i.e., if 100% of the students were single, the mean score would increase by 39.10 points. This finding diverges from the results reported by Santos (2012) and Ferreira (2015), in which the performance of married students was superior to that of single students. However, Andrade and Corrar (2008) found results similar to those found in this study. The fact that married students perform poorer than single students may be related to a married individual's responsibilities, whether father or mother, which can interfere in their time available for studies and, consequently, their academic performance.

Regarding the students' race, the results showed that if 100% of the students were Caucasian, the universities' mean score would increase by 6.95. However, the results did not indicate a significant relationship for Afro-Brazilian students. These results diverge from those reported by Rutherford and Rabovsky (2014), in which a negative relationship was found between being an Afro-American and Hispanic student and performance. The result is also opposed to Pike and Robins (2019) study, which indicates a negative relationship between the percentage of Afro-descendant and performance in undergraduate student performance. This study, however, is in agreement with Ferreira (2015), who states that Caucasian students tend to perform better than mixed-race and indigenous students. She also found that Afro-Brazilian students tend to present inferior performance than Caucasian students, which is opposed to this study's results.

The educational level of the students' mothers was also statistically significant. The mothers who had completed high school or had a college degree were significantly related to performance. Hence, if 100% of the mothers of the students who took the Enade had completed high school, the mean score would increase by 16.89 points, and if 100% of the mothers had a college degree, the mean score would increase by 30.28 points. This study's findings confirmed what was expected, that the higher the educational level of the students' mothers or guardians, the better the student performance. However, Ferreira (2015) found a different result, in which the students whose mothers had attended higher education or graduate studies performed worse than those whose mothers had a lower level of education. A potential explanation is that mothers with higher educational levels influence their children to dedicate themselves to studies, encouraging them to perform better.

Finally, regarding the students' income, the results revealed a positive and statistically significant relationship between students with a family income from 1.5 and 3 times the minimum wage and performance. The remaining income ranges were not significant. Even though it was expected that students at higher levels of family income would present superior performance, the model's results do not indicate this relationship. This finding is opposed to the study by Ferreira (2015), in which students with higher family incomes tend to perform better than those with lower family incomes. However, Moreira (2010) reports that student performance among students with higher family income is inferior to the performance of students from lower family income levels. A potential explanation for students with lower income performing better than those at higher income levels may be motivation. Students with lower incomes may consider the university to be an opportunity to grow personally and professionally, consequently, dedicate themselves more intensively to academic activities. In this sense, Diaz (2007) notes that there is a limited effect of income on student performance; that is, there is a point in which this effect starts decreasing.

Table 3
Results from the regression model with panel data

Variables	Coefficient	P-value
Current cost without UH (COSTS)	-0.00007	0.18
Age (AGE)	1.33	0.00
Female sex (SEXFEM)	23.38	0.00
Marital status (SINGLE)	39.10	0.00
Race (CAUCASIAN)	6.95	0.03
Race (AFRO)	9.06	0.12
Mother's education (HIGHSCHOOL)	16.89	0.00
Mother's education (COLLEGE)	30.28	0.00
Income (INCOMEUP1.5)	-3.37	0.25
Income (INCOME1.5TO3)	14.51	0.00
Income (INCOME3TO4.5)	-4.56	0.38
Income (INCOME4.5TO6)	8.29	0.20
Constant	-48.40	0.00
Chow test		0.00
Breusch and Pagan test		0.00
Hausman test		0.00
Wooldridge test for autocorrelation		0.00
Wald test for heteroscedasticity		0.00
VIF for multicollinearity		2.83
Ramsey test to specify the model		0.00
Doornik-Hansen		0.01

Source: study's data

Despite the importance of identifying the relationship between expenditure with education and student performance, no evidence was found regarding how resources can promote universities' results. Results concerning the students' sociodemographic variables and the universities' current cost per student indicate that in this sample, the sociodemographic factors were more important for student performance than the resources applied by HEIs. Ferreira (2015) believes that students from public universities have a differentiated profile, as they tend to be more engaged with studies. On the other hand, Pike *et al.* (2011) state that the university's resources are indirectly related to the students' expected results because these resources have the potential to improve the qualification of professors, which in turn benefit student performance.

5. Final Considerations

It is relevant to investigate the impact of HEIs expenditure on student performance considering a context in which resources available to federal universities are scarce. The main effects include a potential decrease in student performance. Therefore, this study's objective was to identify the relationship between current cost per student among federal universities and undergraduate student performance. Thus, a total of 62 Brazilian federal universities were analyzed from 2010 to 2019.

The results did not show a relationship between student performance and the HEIs expenditures. Therefore, hypothesis H1: Federal universities with higher current cost per student tend to perform better in the Enade, was rejected. The sociodemographic factors, on the other hand, such as age, race, sex, marital status, maternal education, and income, present a relevant influence on performance in the Enade. Hence, the conclusion is that factors inherent to the students' context have a more significant impact on performance than the resources invested in universities, which corroborates Ferreira's findings (2015).

A possible explanation for cost per student being irrelevant for student performance may be that for it to have any impact would require other than only the amount of resources, i.e., good resources management (Rocha & Funchal, 2019). Additionally, Pike *et al.* (2011) indicate that the HEIs' levels of costs would be related to student performance in the first years of a program. Hence, considering that Enade was adopted as a proxy for performance in this study, the students' background and their cumulative knowledge in the program, additional evidence may be obtained if other measures are adopted to verify student performance in the programs' first years. Other peculiarities of the institutions analyzed here may also affect the level of costs, considering that the relationship between costs and student performance remains unclear. Dahlvig *et al.* (2020) believe that the relationship between resources and student performance is not direct or linear; that is, after a certain point, increments in the level of resources would not affect student performance. Additionally, other variables may be relevant for this analysis because they tend to affect costs or even student performance, such as: when the institution was founded, its location, the programs offered, and the faculty members' degree, among others.

This study's limitations include a lack of data that would enable assigning current costs per student into subgroups. Being able to classify costs into categories would enable a clearer perspective of how the universities' expenditures are allocated, such as cleaning, energy, personnel, and others, which may have an isolated impact on student performance. Another limitation is that even though data from the Enade were analyzed from 2010 to 2019, distinct fields of knowledge are evaluated in each Enade. For this reason, the mean scores may have been affected given the different fields of knowledge that were evaluated in the study period, as well as due to the different programs provided by each of the HEI in the sample.

From the higher education's perspective, it is crucial for the institutions to identify the expenditures more likely to improve student performance (Pike & Robbins, 2019). Therefore, future studies are needed to assess the level of costs and specific performance in the different fields of knowledge such as exact, human, social sciences, etc. Additionally, other proxies should be adopted for universities' expenditures that enable specific analyses of groups of expenditures to contribute to relevant discussions. Therefore, a potential topic for future studies would be to analyze the performance of programs in the health field, considering, among the determinants of current cost per student, the costs with UH, as this field also include hospital infrastructure. Future studies are suggested to use other estimation models, considering lags in the relationship between the HEIs' level of costs and scores the students obtain the Enade. Finally, data concerning the different levels of the universities' infrastructure and development could be considered, such as how old a university is, the types of programs it offers (undergraduate, Master's, and doctoral programs), and proxies for the institutions' infrastructure.

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Reflections upon the feasibility of surveys as a methodological approach in management control studies

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Abstract

Objective: To discuss the methodological aspects of the survey method in the field of management control, considering situations in which structuring a database is a challenge, in addition to establishing a relationship with respondents, managing data collection, considering the logic of the research community, and ensuring information reliability. Motivation accrues from the need to develop and improve this approach considering the difficulties faced in the investigation process given a lack of data.

Method: Considering the discussion of methodological aspects, action research was adopted, having as the background a survey intended to address the planning and control process of family businesses.

Results: Attention is drawn to the following: (i) the importance of establishing the target-population and sample, choosing inclusion criteria, and the means to access companies; (ii) operationalization of data collection, in which the need to communicate and sensitize the respondents was observed; and (iii) the logic of research community, associated with the establishment of and compliance with a research contract.

Contributions: This study discusses the feasibility of surveys and proposes solutions for problems. Regarding its impact, studies not conducted due to a lack of responses from a given field can be proposed and discussed, promoting improved knowledge within the community. The authors expect that the knowledge presented here is helpful for studies facing similar situations.

Keywords: Survey method;Methodological Approach; Management Control.

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1. Introduction

The research environment in the field of applied social sciences developed overtime from the hard science paradigm. The starting point was natural, like accommodating a field within the scientific universe. However, for a long time, it was linked to the advancement of a logic that did not fully meet the researchers' demands in applied sciences. Saunders, Lewis, and Thornhill (2019) considered that business research absorbed philosophical and methodological perspectives from various sources (such as natural, social, applied, and human sciences), which results in the multiple perspectives adopted by the current business field.

Even though, universally, researchers demand scientific research rigor (Merchant, 2012), translating what rigor means demands an overview of the context to which research is useful. Therefore, while some methodological solutions are unacceptable in some fields, they may be reasonable in others. For instance, some fields of knowledge such as engineering, medicine, or even finance, adopt 'strict' criteria for representatively sampling a population, aiming to generalize the results; however, lack of information regarding a given population or aspects that would support sampling in other fields, demands this process be flexible and adapted. Flexibility does not imply giving up scientific rigor; it means customizing rigor, considering the actual context and its possibilities. The logic of knowledge generation itself changes in dimension and does not uniquely depend on a quantitative perspective (Ketokivi& Choi, 2014).

Even though this research problem may be useful in applied social sciences as a whole, this study was developed within the Management Control field. Seminal authors from the management control field have questioned this context (Shields, 2015; Merchant, 2010). According to Merchant (2010, p. 119), "Some important research traditions (e.g., historical analysis, field research, survey research) are being starved out of the accounting academy." Therefore, relevant studies that could influence environments are no longer performed or disseminated unless they overcome the critical challenges imposed on research (Shields, 2015). While the literature in the methodological field reports advantages and limitations specifically related to each method (Smith, 2019), gatekeepers (journal editors, referees) have been skeptical and critical of some methods, such is the case of the design and implementation of surveys (Speklé& Widener, 2018). Van der Stede, Young, and Chen (2006) stress that criticism is not directed to the survey method itself but rather how it unfolds in practice.

Studies in the literature addressing the use of surveys in the accounting and business fields report different views. Mac Lennan and Avrichir (2013), for instance, highlight that replicating surveys is interesting to increase the reliability of previous research, including making these databases available. Other authors, such as Freitas, Oliveira, Saccol, and Moscarola (2000) and Carneiro and Dib (2011), note some advantages and disadvantages of surveys. Many studies are conducted online so that sampling errors, non-response, and even ethical issues should be mitigated without costing research success (Carneiro& Dib, 2011). Given the characteristics of data, the problem seems to be that, in the case of some research topics, either this method is used to collect data or no study will be performed otherwise.

When considering the difficulties of implementing a survey, the first reaction would be discussing scales, sample size, the structure of the population, randomness, and even the concept of generalization (Van der Stede, Young, & Chen, 2006; Speklé& Widener, 2018; Smith, 2019). However, the difficulties start much earlier, such as accessing the target-population and executives facing time constraints to participate in surveys (Van der Stede *et al.*, 2006; Saunders *et al.*, 2019). In other words, to develop statistical analysis, data need to be obtained, which depends on the population structure and sampling (Saunders *et al.*, 2019).

Many researchers use the same databases over the years (e.g., *Revista Melhores e Maiores, Valor 1000, Estadão*), which list approximately 2,000 companies. If on the hand, there are various studies and results regarding this same set of companies, on the other hand, Brazilian companies are on the researchers' radar, but their specificities are not perceived or treated, as is the case of family businesses (Bressan, Schiehll, Procianoy, & Castro, 2019). Consequently, both the assertiveness of studies' contributions may have their relevance restricted because the methodological approach inevitably departs from traditional approaches.

The development of organizations in an environment in which the word 'rupture' demands solutions for problems in which data are not available, imposes a dilemma for researchers between addressing a topic in which there is a difficulty in obtaining and treating data, as opposed to continuing studying already solved problems (Shields, 2015; Lindsay, 2018; Merchant, 2012). Likewise, within research, disruptive or incremental innovation opposes the *status quo* (Merchant, 2012; 2010; Ribeiro, 2014). In this sense, identifying solutions to access, collect, and treat data is essential for developing field knowledge (Speklé & Widener, 2018; Hiebl & Richter, 2018). Therefore, the "quality" of information is essential, which is difficult to perceive if not discussed and planned.

Therefore, if, on the one hand, a survey enables collecting primary data, which are useful to obtain knowledge regarding Brazilian companies, on the other hand, a lack of information to map and structure the desired population becomes an obstacle to the method. Hence, the study's problem consists of having adequate data to conduct surveys, if it will allow advancing the discussion of little developed or seldom addressed problems within the Brazilian context. Thus, the following research question is proposed: How to treat dilemmas to enable the use of surveys? This question is supported by five questions that operationalize the analysis and propositions.

Therefore, this study aims to discuss methodological aspects of surveys within the management control field, considering the dataset structure, the relationship with respondents, management of data collection, sense of research community, and information reliability. This study is justified due to the need for an inward perspective regarding organizations, the type of information required, which is unavailable, in which proxies do not bring comfort to researchers, or a supposedly long-term and rewarding relationship.

In terms of innovation, the result of reflections and identification of proposals for problems, action research stands out, to analyze methodological elements by using a research approach in which contextual solutions were identified and gathered to the study process. According to Tripp (2005), in addition to supporting information and decision-making, action research has the potential to improve practice, which is the purpose here. Additionally, it enables examining current theoretical propositions to seek new theoretical possibilities to explain reality (Lodi, Thiollent, & Sauerbronn, 2017). This is so because action research can be used to understand problems, implement, and assess solutions (Coughlan & Coghlan, 2002) to implementing surveys. This study's background, the field considered by one group of the management accounting field, concerns family businesses' planning and control process. This study's impact accrues from identifying alternatives to implement surveys to support new studies addressing relevant topics.

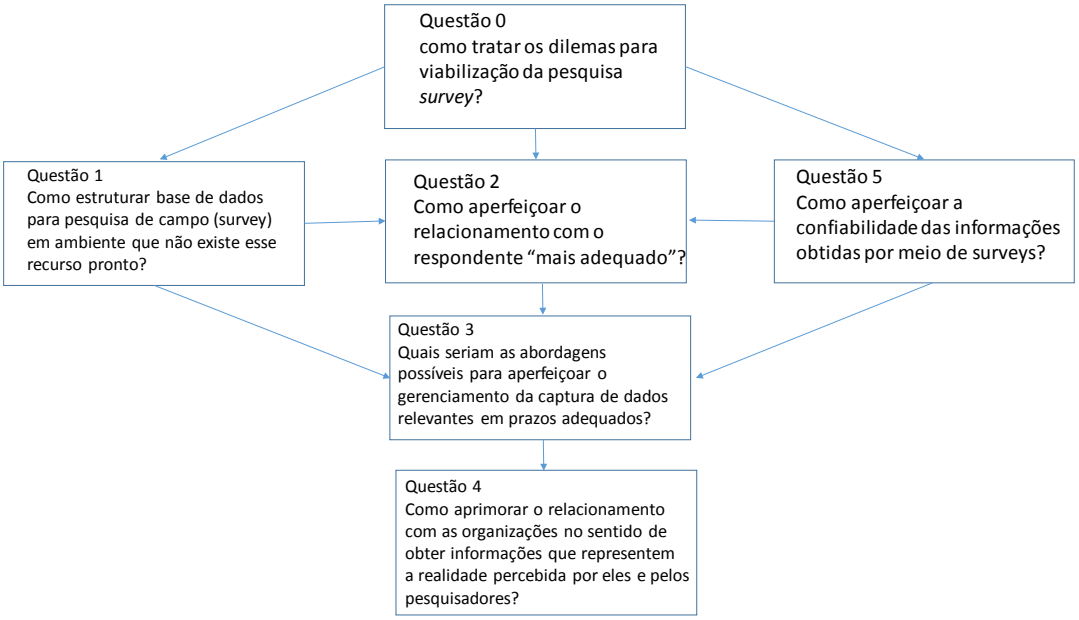
More specifically, this study contributes by proposing a conceptual structure for future surveys to (i) identify the structure of population databases to allow the development of research, its contributions, and uses legitimated by the community; (ii) reflect and discuss challenges involved in the design and operationalization of data collection; (iii) draw attention to the need of establishing a research community to enable sustainable environment for the continuity of research from this perspective.

This paper is organized into five sections, including this introduction. Section two presents reflections regarding the survey approach in studies conducted in the management control field based on Brazilian and international studies, while section three provides clarification on the use of action research as a methodological approach. Section four presents the analysis and discussion of the guiding questions, assessing the observations reported by the literature and the interventions implemented in the specific empirical context in which a survey was implemented among Brazilian family businesses—finally, section five addresses this study's primary findings, reflections and solutions for future research.

2. Considerations regarding the survey method without management control

Survey studies are widely used in applied social sciences due to the ability to effectively gather relevant information, unavailable otherwise (e.g., perceptions, feelings, opinions, facts, etc.), from a target-group according to a given research objective (Dillman, Smyth, & Christian, 2014; Saunders *et al.*, 2019). In most cases, surveys are used to test or refine theories, collecting potential data, and performing analysis, which results in expanded academic and business knowledge (Bisbe, Batista-Foguet, & Chenhall, 2007; Speklé & Widener, 2018; 2020). Using available data such as proxies enables addressing specific research problems, but this is not always the case, and primary information can be a qualitative differential and contribute to the reliability of improved knowledge (Saunders *et al.*, 2019).

The umbrella question that enables reflecting upon the topic's elements addressed here is **How to treat dilemmas to implement surveys?** Strictly speaking, it promotes a reflection and the identification of issues concerning the operationalization of research. The questions that unfolded from this umbrella question are presented in figure 1 and further explored below.



Translation: Question 0 – How to treat dilemmas to implement surveys? Question 1 – How to structure a database for field research (survey) in an environment where this resource is not readily available? Question 2 – How to improve the relationship with the "most suitable" respondent? Question 3 – What are the potential approaches topromptly improve the management of relevant data collection? Question 4 – How to improve relationships with organizations to obtain information regarding the reality the respondents and researchers perceive? Question 5 – How to improve the reliability of information obtained through surveys?

Figure 1. Summary of the questions addressed.

Despite technological advancement, the current research context aggravates the difficulty of implementing surveys, and the low response rate is a fact. Even though previous studies attempted to provide insights on how to solve survey implementation problems, some questions remain, mainly when focusing on the management control of family businesses. A survey is intended to capture managers' profiles, the essence of organizations, and the processes the individuals experience. This task is even more challenging when the companies investigated are family businesses, about which there is no previous database to access. Understanding the need for a survey due to the type of data required, some problems emerge like sampling and the survey's role considering the study objective (Van der Stede *et al.*, 2006). Thus, dimensioning the size of the target population is a complex task. Consequently, the following questions are proposed: **Question 1 – How to structure a database for field research (survey) in an environment where this resource is not readily available?**

In addition to the aspects related to population and sample, another difficulty is to define and find the most suitable respondents for a survey. This is something that bothers researchers; the level of control is debatable, and the type of concession that does not affect a study's final product is in the researchers' minds. Hiebl and Richter (2018) discuss the hierarchical level issue, and the response rate is another part of the equation (Hartmann &Slapničar, 2012). Due to this topic's importance, the following question is proposed: **Question 2 – How to improve the relationship with the "most suitable" respondent?**

Many strategies can be used during data collection within a survey, such as mail, telephone calls, e-mail, and the Internet. Each platform has its advantages and disadvantages (Smith, 2019; Saunders *et al.*, 2019). Compared to traditional research methods, online surveys present many advantages, among which the fact that questionnaires are delivered faster, at a lower cost, there are more design options, and questionnaires are returned faster. However, online surveys also face specific challenges, such as missing data and low response rates, leading to biased results (Couper, 2000; Fricker & Schonlau, 2002; Hiebl & Richter, 2018).

Considering that response rates in online surveys is a concern for researchers, Fan and Yan (2010) and Keusch (2015) developed a conceptual model using systematic reviews to find the factors that influence response rate, both during the study development, when delivering the questionnaires and in the conclusion and feedback stages. The authors found that a successful survey is significantly influenced by factors such as the number of topics addressed, time required to answer the questionnaire, the instrument's format and design, and how easily the questionnaire link is accessed in different web browsers and devices.

In addition to the quantitative aspect of data collection, the number of results available, there is the qualitative aspect, which does not always go hand in hand. The literature reports some challenges; for instance, Cycyota and Harrison (2006)state that a set of measures such as obtaining prior consent, carrying out a follow-up, sending reminders, and customizing communication were not effective in ensuring response rate among top-level executives. On the other hand, Hiebland Richter (2018) suggest previously contacting potential respondents, using non-random samples, and focusing on lower-level managers.

Surveys are one of the quantitative approaches most frequently adopted in management accounting research, and the number of useful responses and high response rates are essential aspects to consider in this method (Hiebl & Richter, 2018). In a study addressing 140 papers published in high-impact journals, however, Hiebl and Richter (2018) verified a downward trend among the response rates of studies conducted in recent years in the management accounting field. They also found that population size, the region where the study is conducted, scales, respondents' hierarchical level, the subject addressed, random sampling techniques, and whether the population was contacted before the questionnaires were sent are significantly associated with response rate and the studies' success.

Therefore, **Question 3 – What are the potential approaches to promptly improve the management of relevant data collection?**

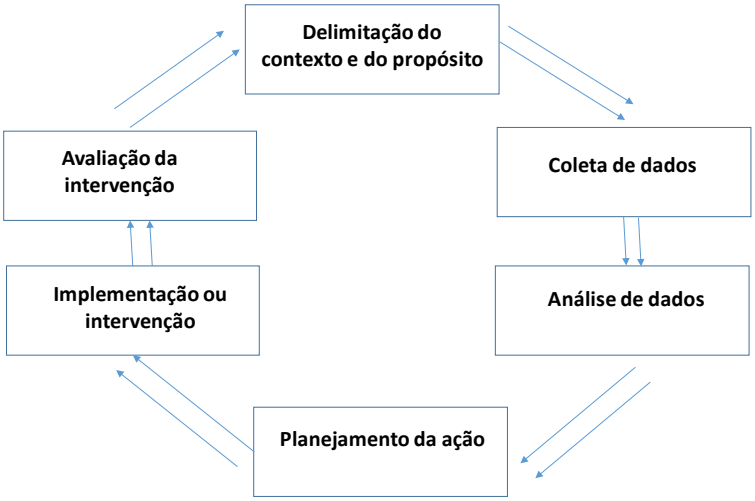
A survey is not something cold, neutral, or without impact on society, but something that affects the lives of agents and they react to stimuli. One way to look at it is to consider its social impact (or how it should impact) on the community (Nicolai &Seidl, 2010). Giving the respondents the proper conditions to understand the survey is part of a researcher's task. Without approximating the academia to the field, research will no longer address relevant aspects; neither the society will understand them (Shields, 2015; Lindsay, 2018; Merchant, 2012), which lead us to **Question 4 – How to improve relationships with organizations to obtain information regarding the reality the respondents and researchers perceive?**

Response reliability is another essential but complex issue to solve (Van der Stede *et al.*, 2006). It can be addressed from different angles: non-sampling error, non-response error, response error, and social desirability bias, among others (Podsakoff, MacKenzie, Lee, &Podsakoff, 2003; Van der Stede *et al.*, 2006; Spekléand Widener, 2018). Indeed, many researchers using surveys as a methodological approach consider the extent to which errors and biases compromise their findings and conclusions. This is a critical consideration and, in general, permeates the other guiding questions, which leads us to **Question 5. How to improve the reliability of information obtained through surveys?**

Note that these issues are discussed in books and papers with a methodological focus (e.g., Van der Stede *et al.*, 2006; Saunders *et al.*, 2019; Smith, 2019). Therefore, the purpose of this paper is not to provide basic knowledge regarding the design and implementation of surveys, but to contribute with proposals identified, customized, and employed in a survey addressing the planning processes of family businesses, discuss critical issues experienced in the process, and share concerns with other researchers from the management control field(Van der Stede *et al.*, 2006; Speklé & Widener, 2018; Hiebl & Richter, 2018).

3. Study design

This study was conducted by interacting with the field. An inductive approach was used, inspired in action research(Coughlan & Coghlan, 2002; Thiollent, 2009), which strongly interacts with the field, especially with emerging topics in which knowledge of the context may bring relevant contributions.



Translation: Understanding context and purpose. Data gathering .Data Analysis. Action planning. Implementation/Intervention. Evaluation

Figure2. Dynamics of the model proposed by Coughlan & Coghlan (2002).

Source: adapted by Coughlan, P., & Coghlan, D. (2002). Action research for operations management. *InternationalJournalofOperations&Production Management*, *22*(2), pp. 220-240.

Figure 2 shows the dynamics of the model proposed by Coughlan and Coghlan (2002), which includes the following stages: **Understanding context and purpose**, which in this study consists of a survey among family businesses. The survey's objective was to address the planning process of Brazilian private family businesses of different sizes. According to the topic, target respondents included family members and top-level managers, preferably those in administration, controllership, and finances.

All the stages and decisions concerning this survey's design and implementation grounded this study. **Data gathering** refers to evidence and notes taken from the periodical meetings held throughout the intervention and the monitoring of responses. **Data Analysis** involves the exchange of information between researchers and companies to understand, for instance, why the respondents accepted to participate in the study and how they perceived this interaction between academia and businesses. **Action planning** comprises the interventions that led to the use of other approaches in addition to those initially planned. The **Implementation/Intervention** includes establishing the target population, videos to invite potential respondents, changing the format of invitations and reminders (follow-up), and identifying respondents, among other strategies.

In the **Evaluation** of the data collection process, the researchers regularly discussed the partial results the strategies enabled in terms of the number of responses obtained, the reliability of the answers provided to the questionnaires, and also considered ethical and technical aspects. These strategies were recorded and monitored by the researchers to reflect upon the results, as recommended in action research (Coughlan & Coghlan, 2002; Thiollent, 2009; Kemmis, McTaggart, & Nixon, 2014).

The action research stages were adopted in this study and applied to each of the five guiding questions. The following were discussed for each of the following: (i) What does literature says and what is the gap in the field? How does it materialize and what are its limitations?; and (ii) the identification and discussion of contributions based on empirical evidence.

4. Analysis and discussion of the guiding questions

Five guiding questions were proposed in this study and are discussed next.

Question1. How to structure a database for field research (survey) in an environment where this resource is not readily available?

What does the literature say and what is the gap in the field?

Not having available a dataset with the characterization of the target population with the profile desired impedes some types of studies. According to the Brazilian Institute of Geography and Statistics (IBGE –2019), the population of medium and large companies (above 250 employees) is more than 85,000. Most of these companies are unavailable because of a lack of information such as name, region, and contacts. For this reason, these companies are not addressed by studies in the management control field.

The field of applied social sciences is often criticized due to the little use of random sampling techniques to address populations (Landers & Behrend, 2015; Smith, 2019). The question is whether randomness meets the purpose and can contribute to the quality of information required by the different research problems and interests. In Brazil, for instance, replacing Itaú-Unibanco by Bradesco or by Banco do Brasil or yet, Santander based on randomness does not make any sense considering the differences in terms of organizational structure, strategies, and behavior.

When analyzing sampling techniques used by studies in management control, Van der Stede*et al*. (2006) identified a predominance of non-probabilistic methods, mainly convenience samples (approximately 70% of the studies). Convenience samples are a common strategy used when the population is unknown, i.e., there is a lack of a suitable database of potential companies and respondents.

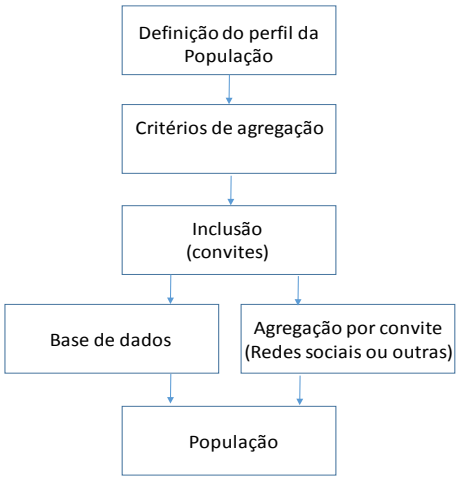
Considering that studies from the management control field widely use convenient samples, Speklé and Widener (2018) suggest differences in this approach in descriptive studies and theory-testing studies. According to Speklé and Widener (2018), descriptive studies should pay greater attention to the generalization of results obtained from a given population sample and, for this reason, demand probabilistic sampling techniques (Van der Stede *et al*., 2006).

Theory-testing studies require a relevant sample of the individuals or organizations to whicha giventheory applies; thus, concerns regarding samplingfall on coverage bias. Coverage bias is verified when the initial list (sampling frame) does not cover the target population (Speklé & Widener, 2018).

Identification and discussion of contributions based on empirical evidence

The sampling frame can start with identifying the databases available, to which companies with different profiles can be added. Note that the sampling frame does not need to be random, or perhaps should not be completely random or simply include existing databases. In addition to the number of companies one wants to address, it is necessary to take into account the type of companies desired and select their characteristics while, at the same time, minimizing coverage error. In this sense, the sampling frame needs to be aligned with the target population; that is, it needs to present the same profile of the target-population, of the group of companies and/or individuals to whom the theory applies (Van der Stede *et al*., 2006; Speklé & Widener, 2018).

This study's research project established this sampling frame based on family businesses stratified according to size; businesses were assigned to four groups according to different complexity levels. This stratification was chosen because the authors expected different management and control practices between companies in different organizational development stages; it was the basic criteria to establish the **population profile** (Figure 3).



Translation: Establishing the population profile .Aggregation criteria. Inclusion (invitations). Databases. Inclusion by invitation (Social media or others). Population

Figure 3. Structuring the study's population.

After establishing the **aggregation criterion** used to include companies in the databases by stratifying the population, the companies' managers were invited to participate in the study (see Figure 3). Because it is a different heterogeneous composition, in which companies' data are not included in available databases, the researchers decided to send**invitations**according to two strategies: first, by inviting the participants of previous studies, considering the small, medium, and large-sized companies, of durable and non-durable goods (**database**); and secondly, by **inviting** potential respondents, other than top-level managers, with active profiles in LinkedIn® **professional network**, always paying attention to the companies' characteristics necessary to answer the study question.

Once the desired sampling frameprofile was chosen from which the sample would be recruited, data collection was initiated, and procedures will be addressed next.

Question 2 – How to improve the relationship with the "most suitable" respondent?

What does the literature say and what is the gap in the field?

The definition of the most suitable respondents to be addressed in a study considers various aspects, depending on the study's level of analysis. If the analysis level is organizational, the respondents' profile can be based on hierarchical levels, how long the individuals work for the company, and their level of involvement in the phenomenon under study (e.g., budgeting process). If, however, the level of the analysis is individual, then one's background, professional experience, and individual characteristics are considered.

Some parameters are usually adopted in surveys, such as the respondents' hierarchical level, how long they work in the company, job position, and area. Hiebl and Richter (2018) consider that the higher a manager's hierarchical level, the more difficult it is to obtain answers. Studies in the management control field tend to attract financial executives, though there are studies addressing managers from other fields with relatively high response rates (e.g., Hartmann & Slapničar, 2012). It is important to note that: (i) having a suitable respondent profile can impact a study's response rate; (ii) often, the target profile is not possible to be delimited/approached; or even (iii) accessing respondents is not always feasible. Hence, researchers are supposed to establish the response error that is acceptable from an empirical and theoretical perspective.

The suitable respondent may depend on knowledge, experience, hierarchical level, position within the structure, and the acceptable level of bias. There may be situations in which the survey may require more than one respondent per company to meet the study's scope (e.g., Madison, Kellermanns & Munyon, 2017).

Identification and discussion of contributions based on empirical evidence

Having a database of family businesses is one of the examples of a gap in research. Having information regarding different respondents is even more challenging. Consequently, the search for subjective, qualitative responses, inferences, and useful responses may lead to conclusions that do not correspond to the actual context, which could be obtained from different respondents.

Translation: Alternative inclusion criteria. Acceptable bias. Access to respondents. Tests to validate the aggregate. Establishing the respondents' profiles. Access to respondents. Population and sample. Indirect access to respondents

Figure 4. Suitable respondent.

This study's research project established the **target-respondent profile (Figure 4)** based on hierarchical level, considering family representatives, the president, directors, and controllers. Due to a need to treat the management control device and the company's life cycle, these executives should be well informed regarding these elements and be able to provide reliable and comprehensible information regarding the topic.

Depending on the study's needs, some alternatives can be adopted. Certain studies demand answers from the proprietors, but these contacts are often unavailable in lists or social media, and in this sense, depending on the questions, they can be directed to the executives close to the proprietors, such as directors. This argument can be reinforced with additional information regarding how long the respondent works for the company and occupies that specific position.

Not a single respondent who met the profile was found in many of the companies approached, while in other companies, especially the large ones, more than one respondent was identified. In some cases, we could not identify the target-respondent according to hierarchical level, so that **alternative inclusion criteria**were adopted (i.e., higher hierarchical level, experience in the company, and area). Based on these criteria, an **acceptable level of bias** was established. Therefore, **access to respondents** with this profile is the fundamental parameter used to include a company in the sample. These elements are presented in Figure 4.

An alternative would be establishing contact with one executive within the company who was open to research and ask him/her to intervene and connect the company's proprietor through LinkedIn®. In some cases, especially among large companies, appropriate **indirect access** was attempted through the sampling frame's contacts.

Throughout data collection, meetings were held with the respondents who accepted to discuss the study's approach and questionnaire for the research group to learn information and obtain knowledge (Kemmis *et al*., 2014) regarding (i) the respondent's motivation to participate in the study; (ii) the format and means through which the respondent was contacted; (iii) the respondent's adherence to the research topic; and (iv) complaints or suggestions in general. It was an important stage for the **tests to validate the aggregate**, representing a qualitative analysis of the respondents' profile and more operational issues, such as whether presenting the study using a short presentation video. This last element was considered an alternative to drawing potential respondents' attention, possibly impacting the **population and sample**. It would be a more objective way to communicate the study's purpose to a group of professionals known for time constraints.

Question 3. What are the potential approaches to improve the management of relevant data collection promptly?

What does the literature say and what is the gap in the field?

Researchers use different means to implement surveys, such as mail, telephone calls, and e-mail, among others (Dillman *et al*., 2014); there was a significant increase in online studies in recent years (Fan & Yan, 2010).

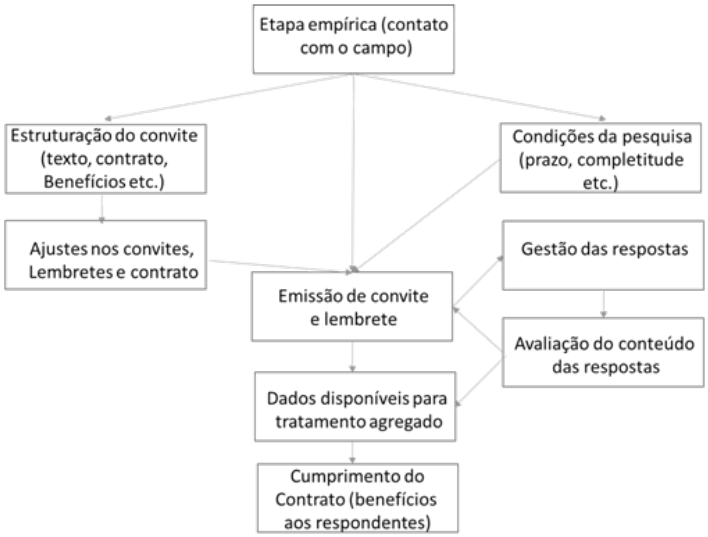
Compared to studies' traditional models, online surveys present various advantages, among which the fact that questionnaires are sent faster, at a lower cost, more design options are available, and responses are returned faster (Smith, 2019; Dillman *et al*., 2014). Online surveys also face specific challenges, however, such as missing data and low response rate, possibly leading to biased results (Couper, 2000; Fricker & Schonlau, 2002).

Many studies attempted to reveal the factors that possibly influence the success of surveys. Cycyota and Harrison (2006), for instance, report that various techniques widely discussed in the literature, such as prior consent, follow-up and reminders, and customization were not effective in improving response rates among top-level executives. Hiebl and Richter (2018) consider that the factors influencing response rates in the managerial control field include establishing a previous contact with the potential respondents, using non-random samples, and focusing on lower-level managers.

Because low response rate among online surveys is a major concern among researchers, Fan and Yan (2010) and Keusch (2015) suggest that response rate is influenced by factors such as the number of topics addressed, time needed to complete the questionnaire, the instrument's format and design, and how easy thequestionnaire link is accessed in different web browsers. Even though many studies were developed to map strategies intended to increase surveys' response rate, they usually present divergent results, considering this is a multidimensional and mainly conceptual discussion. Some authors highlight the critical elements of survey design and the importance of customizing the method (Smith, 2019; Dillman *et al*., 2014), discussing how different strategies can benefit surveys regarding response quality and response rate.

Identification and discussion of contributions based on empirical evidence

Potential respondents were contacted through the LinkedIn® professional network and by e-mail.



Translation: Empirical stage (contact with the field). Invitation development (text, contract, benefits, etc.). Invitations, reminders, and contract were adjusted.Invitation and reminder were issued. Data available to perform aggregated analysis. Fulfilling the contract (respondents' benefits). Study's conditions (deadline, completeness, etc.). Managing responses. Assessing the responses' content

Figure 5. Strategies for managing data collection.

Invitations (Figure 5) occurred in two stages. A standardized invitation was initially sent, providing clarification regarding the study's design and mentioning the importance of the manager's participation. After potential respondents accepted the invitation to be included in the contact network, a more detailed message was sent with a link to the questionnaire. This message informed that an incentive/benefit would be provided in case of participation in the study, i.e., an individual and personalized report to each respondent (company). These and other aspects of the data collection process are discussed in this subsection and are presented in Figure 5.

The researchers also invited the managers of organizations that had previously participated in other studies or belonged to the LinkedIn® professional network. The managers who were already familiar with the researchers were more open to participating in the study, perhaps due to familiarity and trust. In this sense, note that these elements were part of the **invitation** (including contact between researchers and respondents).

As previously mentioned, based on the interviews held with some respondents, the researchers identified opportunities to increase the number and quality of responses. In this sense, **invitation and contract were adjusted.** An important change concerns how communication was established with potential respondents; only written communication had been used up to that point. Therefore, the researchers recorded short and objective videos explaining the study, a strategy that apparently led to increased receptivity. Another change was intensifying contact through LinkedIn®, including managers whose e-mails were available. Finally, the individual executive reports were sent to the respondents using more direct language and graphics within a month after the responses were returned. In other words, the respondent received the benefit not much longer after sending his/her contribution.

The **conditions** established in terms of **deadline s**and **response** validity were monitored throughout data collection. For instance, questionnaires had to be complete. In this case, when a respondent had not finished answering the questionnaire, s/he was contacted immediately, which resulted in a lower number of incomplete questionnaires.

Regarding the **issuance of invitations and reminders**, we verified in this study that the day or time in which the invitations were sent was not relevant to obtaining responses. In addition to the invitations, reminders were sent after approximately three weeks. We believe that respondents are sensitized for not having answering an invitation and pay greater attention when reminded.

In general, each potential respondent was contacted three times, first with an invitation, then with a reminder 20 days after the invitation was sent, and finally, one last time a few days before data collection ceased. The first reminder effectively increased the number of responses; however, those who did not answer the first reminder did not answer the survey after the last call.

The researchers **monitored the responses** weekly to identify incomplete questionnaires and act promptly, assessing the reliability of responses and dubious answers in the case of more than one respondent per company, as well as the rate of adherence per each stratum of companies (clustered according to size). This assessment enabled the researchers to manage the number of answers per stratum, which also guided the preparation of the individual executive report. In terms of feedback, an executive report was developed at the end of data collection considering **aggregated data** and shared among the respondents. Note that both an individualized and aggregated perspective of the responses sensitized the researchers regarding the study's discussions. The aspects previously mentioned were disclosed within a contract signed by the respondents.

Question 4. How to improve relationships with organizations to obtain information regarding the reality the respondents and researchers perceive?

What does the literature say and what is the gap in the field?

A topic increasingly and more intensively debated in scientific research concerns its social impact (or how it should impact) the community (Nicolai & Seidl, 2010). Researchers from the management control field are sensitive to this issue and have attempted to develop reflections that promote more significant social impact. One of the repercussions concerns the need to approximate the academia to the business environment (Corley & Gioia, 2011) so that research problems reflect relevant phenomena (Shields, 2015; Lindsay, 2018; Merchant, 2012).

In this sense, an important pillar in the relationship between researchers and companies' managers is the perception that scientific research can provide a relevant contribution to the professional context. Lindsay (2018) unfolds relevance into two aspects: the first is a reflection regarding practice and behaviors, and the second refers to the practical applicability of management tools. This is a fundamental aspect, and researchers have to be attentive to the study's design and communication, especially with surveys, in which there is usually a physical distance separating researchers from respondents.

Perceptions regarding the relevance of studies on the part of potential respondents depend on: the respondent's familiarity with the topic under study and practical interest in implementing a management control device in his/her organization, considering problems routinely experienced. Additionally, the respondents' perceptions may be influenced by previous contacts established with the researcher (e.g., classes, congresses, or other interactions), taking into account the image of institutions with which researchers are affiliated. Another strategy used, especially in surveys, is incentives in exchange for participation, such as donations, reports, or awards, among others (Dillman *et al*., 2014; Smith, 2019).

These and other mechanisms are part of the contract established between researchers and potential respondents, comprising informal (trust, familiarity, image) and formal elements (invitation, questionnaire, incentives). The logic of this contract, the background of which is the study relevance, is vital to improving the relationship between researchers and organizations and developing a research community. This practice enables increasing response rate and tends to improve the quality of information, considering that managers become more motivated to answer the questions faithfully, as they assign greater value to the process. The consequence of these steps is to provide participants with information, the benefit of knowledge, as it should be the primary objective of the research.

Identification and discussion of contributions based on empirical evidence

In addition to recruiting respondents to a survey conducted at a given point in time, the researchers are also interested in future research and how to collect data promptly. Obviously, in addition to the advancement of research within the academic milieu, organizations also need to advance; after all, research in applied social sciences is developed to connect theory and practice.

Hence, by contacting the managers participating in the study, the researchers sought to establish a relationship between the companies and the academia, inviting the managers to provide their opinions, holding online meetings to address these suggestions, verifying whether the reports and invitations and even the topics addressed were pertinent. Therefore, the intention was not to simply gather a certain number of respondents but rather to establish a relationship with the companies, which can be called a research community.

This relationship with the companies was based on the **logic of the contract** established between the researchers and the potential respondents since the first contact was established through the professional platform LinkedIn® and e-mail. The concept of this study's contract is aligned with the proposed by Borgatti and Molina (2005), a contract that clearly describes the agreement established between the parties, for instance, consent to collect data, data analysis, and feedback provided to the companies. Additionally, the authors suggest the many resources and designs can improve the respondents' experience during data collection. Figure 6 presents the factors that permeate the discussion regarding the contract's logic.

Translation: Contract's logic. Project's needs. Eliminating risks to respondents. Communication mechanisms (e-mail, video, etc.). Benefits to the organization and respondent. The contract is communicated in the invitation. Operationalization of the contract

Figure 6. Relationships with organizations.

Due to the project's needs, information necessary to meet the demands of the defined construct needs to be considered. An essential element to **eliminate the respondents' risk s**was to clearly identify the researchers with a profile in the LinkedIn® and/or with an institutional e-mail. Priority was given to LinkedIn® because it confers greater confidence in the researchers' and respondents'identities, that there are no viruses or spams (as it happens with e-mails), and because of the possibility to create a network of professional contacts for future interactions.

Additionally, the **communication mechanisms** used were intended to communicate the importance of the study and data analysis procedures, such as ensuring the confidentiality of the respondents' information. The invitations were sent to the individuals' professional profile, and the video-invitation and reminders somewhat approximated the researchers and respondents, strengthening ties of trust between the parties.

Note that the contract established **benefits would be provided to the respondent and organization** concerning the sharing of knowledge produced in the study. Knowledge was shared through two executive reports: the first was sent up to one month after participation, containing an individualized analysis of the company considering its organizational life cycle, crises, and managerial artifacts; and the second report was sent after data collection ceased, providing aggregated data of all the companies in the sample, enabling them to make inferences.

Specifically, the survey implemented guided this study, and the stimulus provided to recruit respondents was to provide an **individual report** to each of the respondents, waving with potential opportunities for the organization's planning; feedback was very timely. When talking to some of the respondents, they reported that the feedback was pertinent and interesting, containing graphics and accessible language. The **aggregated report** emerged from the respondents' interest in obtaining this information, which represented an implementation (Coughlan & Coghlan, 2002) that emerged from the interaction with the field, which is common after communication is established.

Some organizations are more open than others, and establishing a relationship is not immediately facilitated and perhaps not even possible after only one survey. A relationship needs to be carefully developed over time to avoid biases, though it is undoubtedly something we consider relevant for the advancement of surveys.

Question 5. How to improve the reliability of information obtained through surveys?

What does the literature say and what is the gap in the field?

Another critical aspect to be discussed in terms of surveys is the procedures used to treat data during and after data collection to verify **response reliability**. Therefore, some types of bias to which surveys are subjected are addressed here. These biases accrue from the use of non-random sampling techniques such as non-sampling error and non-response bias (Van der Stede *et al*., 2006).

First, non-sampling error derives from **non-random sampling techniques** and may lead to **non-response error** and **response error**, which respectively refer to when invited managers do not answer the survey, and when they do, their response is not appropriate (Van der Stede *et al*., 2006). Non-random sampling error is common in studies conducted in the field of managerial control, considering that most studies do not adopt random sampling methods (Van der Stede *et al*., 2006).

Non-response bias refers to the extent to which respondents differ from non-respondents in terms of generalization of results (Moore &Tarnai, 2002; Van der Stede *et al*., 2006). The difference between non-respondents and respondents may be related to some factors, such as the characteristics of the target population (age, sex, income, education, and area of professional activity), the organization's characteristic (size, sector), or the survey's characteristics (topic, duration, etc.) Tomaksovic-Devey, Leiter, and Thompson (1994) note that authority, ability, and motivation are important factors for not responding to a survey. Authority refers to the hierarchical level of potential respondents; ability refers to knowledge and familiarity of the potential respondent to the topic and instruments, and motivation involves the interest of potential respondents in the study. Usually, non-response bias is an issue addressed in management control studies considering the statistical differences between the first and last respondents (Van der Stede *et al*., 2006), considering that most of these studies do not have information regarding the population. Another aspect discussed by Van der Stede *et al*. (2006) refers to **item non-response**, which is treated as **missing data** and is a source of bias and may lead to validity reliability problems in measuring constructs.

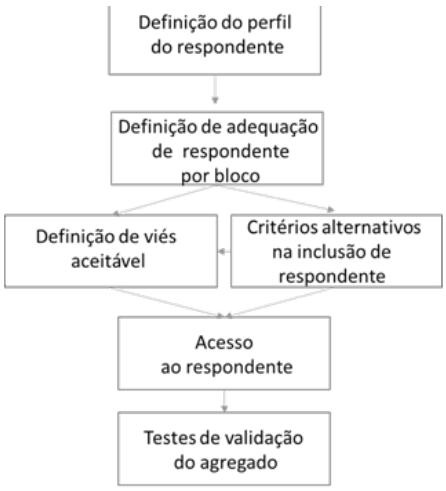
Response-error is present in studies using the survey approach because these use self-reported data, and thus, are conditioned to different types of biases (Podsakoff *et al*., 2003), which include social convenience and the respondent's mood for instance (Podsakoff *et al*., 2003). Speklé and Widener (2018) discuss two types of biases, social desirability bias, which refers to distorting responses to align to social standards, and the halo effect, which reflects a situation in which general perception influences a specific judgment.

Finally, in addition to the survey design, these aspects should be discussed after collecting data to verify the extent to which a given empirical study is subject to biases

Identification and discussion of contributions based on empirical evidence

Empirical research followed the survey design procedures, starting with the establishment of **the target-respondent profile** in terms of hierarchical level and other complementary aspects, such as area and experience in the company. As previously mentioned, in some companies, there was not a respondent who met these requirements, and for this reason, we established an **acceptable level of bias** to **access respondents** (as shown in Figure 7).

Because a convenience sample was adopted, this study is subjected to response and non-response bias. **Non-response bias** may be an issue here, but it is difficult to treat; it cannot be identified if the sample has similar characteristics to the target population (due to an absence of data regarding the target population). This sort of bias cannot be diagnosed using the first and last respondents' test, considering that the invitations were sent during approximately one year, and the potential respondents were added to the sampling frame by identifying their profiles at LinkedIn®.



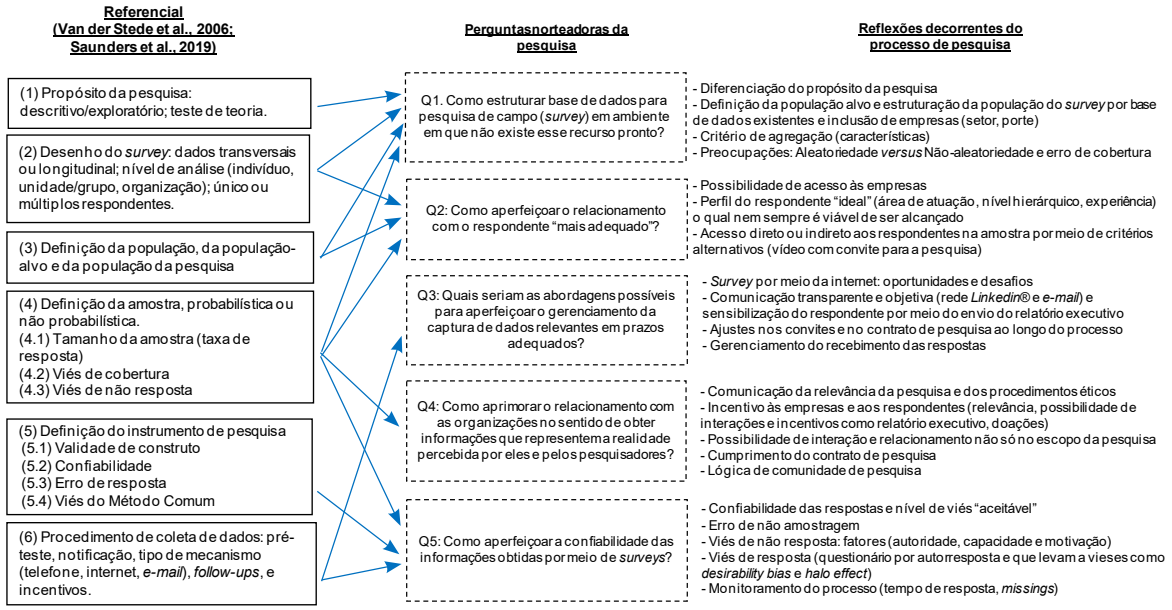
Translation: Establishing the respondents' profile. Establishing how suitable respondents were per block. Establishing an acceptable level of bias. Alternative criteria to include respondents. Access to respondents. Test to validate aggregate

Figure 7. Respondents' configuration

Regarding response bias, the researchers monitored the responses to screening for valid and reliable responses, discarding those suspected of low-quality responses. While attributes such as the respondent's quality regarding authority and ability to participate in the study were addressed through the survey design and identification of potential respondents, the respondents' motivation was monitored and adjusted throughout the process by changing some strategies. First, a written invitation format was replaced by a video-invitation. Second, monitoring the respondents and using reminders, also highlighting the importance of the individual executive report, decreased response bias, and missing data; thus, a database with few incomplete responses was obtained. Third, the researchers monitored whether there was more than one respondent per company, how long it took to complete the questionnaire, and situations with a specific treatment, for instance, due to the exclusion of complete questionnaires.

As presented in Figure 8, the guiding questions are aligned with survey procedures addressed by the literature, including for the management control field (Van der Stede *et al.*, 2006). The guiding questions comprised one or more of these aspects simultaneously and emerged from the literature and the survey development process conducted among Brazilian family businesses.

By reflecting upon the process of implementing a survey, various issues were discussed in this section regarding the difficulties and solutions the researchers found to, whenever possible, decrease bias and increase response reliability and response rate, in addition to considering the importance of a sense of research community. This reflective approach can be observed in each guiding question, which was intended to clarify the challenges imposed on the implementation of surveys, given the demands faced during the investigation process, whether because of a lack of data, difficulty in accessing organizations and people, or difficulty in adapting instruments to the practical context, while simultaneously observing construct validity, among others. As highlighted by Van der Stede*et al*. (2006) and Speklé and Widener (2018), despite these challenges, including acceptance on the part of the research community, surveys are crucial to advance in management accounting and applied social sciences as a whole.



Translation: Theoretical reference framework: 1.Study's objective: descriptive/exploratory; theory testing; 2.Survey design: cross-sectional or longitudinal data; level of analysis (individual, unit/group, organization); single or multiple respondents; 3.Establishing the target population and study population; 4.Establishing the sample, non-probabilistic or probabilistic: (4.1) Sample size (response rate), (4.2) Coverage bias, (4.3) Non-response bias. 1.Establishing the study's instrument: (5.1) Construct validity, (5.2) Reliability, (5.3) Response error, (5.4) Common method bias. 1.Data collection: pretest, reporting, means (telephone, internet, e-mail), follow-up and incentives. Guiding questions - Reflections arising from the study process: Q1 – How to structure a database for field research (survey) in an environment where this resource is not readily available? - Differentiate the study's purpose; - Establishing the target population and sampling frame based on existing data and by including companies (sector, size); - Aggregation criteria (characteristics); - Concerns: Random versus Non-random and coverage error; Q2 – How to improve the relationship with the "most suitable" respondent?; - Alternatives to access companies; - Suitable respondents' profile (area of professional practice, hierarchical level, experience), which is not always achieved.; - Direct or indirect contact with respondents in the sample by using alternative criteria (video-invitation); Q3 – What are the potential approaches to improve the management of relevant data collection promptly?: - Online survey: opportunities and challenges; - Transparent and objective communication (LinkedIn® and e-mail) and sensitization of respondents by sending executive report; - Adjusting invitations and study contract throughout the process; - Managing response; - Communicating the study relevance and ethical procedures; - Incentives to the companies and respondents (relevance, possibility to interact, and incentives such as executive report, donations); - Interaction and relationship possibilities not only within the study's scope; - Fulfilling the study's contract; - Logic of research community; Q5. How to improve the reliability of information obtained through surveys?; - Reliability of the responses and "acceptable" level of bias; - Non-sampling error; - Non-response bias: factors (authority, ability, and motivation); - Response bias (self-reporting questionnaire, which may lead to social desirability bias and halo effect); - Monitoring the process (time required to complete the questionnaire, missing data)

Figure 8. Considerations regarding the implementation of surveys.

5. Final Considerations

This study's objective was to discuss methodological perspectives of surveys based on five guiding questions addressing databasestructure, relationship with respondents, managementof data collection, sense of a research community, and information reliability, thus, permeating the technical and ethical aspects of surveys.

The proposals are aligned to both the difficulties faced in the survey process and discussions proposed by previous studies (e.g., Van der Stede *et al*., 2006; Spékle & Widener, 2018), the background of which was a field study developed in management control of family businesses. Methodological studies do not frequently address these problems, given the practical focus of the data collection process stages. Additionally, when the researchers participate in the process, they face many unexpected challenges, which affect the entire study design.

This study raises these questions from a critical perspective on how to conduct the data collection process using questionnaires while at the same time focusing on the literature, experiences, interventions, and learning process. This study discussed each guiding question from the action-research perspective, the background of which was a survey conducted among Brazilian family businesses of varied sizes, addressing management control practices within the organizational life cycle. Within this context, this study explored difficulties and solutions to the use of surveys to draw attention to the fact that the most suitable design may not be feasible in many cases.

This study specifically addresses: (i) the importance of establishing a target-population and sample with the problem in mind; (ii) the operationalization of data collection itself, considering attributes such as desirable respondent profile, the format of communication, and management of the data collection process; and (iii) the importance of considering the logic of research community, which considers the establishment of and compliance to a research contract. Therefore, an inward perspective of research itself provides the means to reflect upon and improve surveys, to advance in studies addressing relevant topics, seldom explored thus far, considering the challenge of obtaining data.

This study is expected to promote a reflection and suggest solutions to other researchers using surveys as the primary methodological approach to collect data. Surveys are a method widely used in the field of management control. Thus, recent studies have attempted to reflect upon its role, limitations and to consider alternatives to expand its acceptance in the research field (Speklé& Widener, 2018; Hiebl& Richter, 2018). Therefore, this study contributes to the literature, by sharing reflections regarding the Brazilian context, based on a survey conducted among family businesses, guiding the development of surveys in other fields facing the same challenges.

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Budgeting process configurations: an analysis of companies operating in Brazil

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Abstract

Objective: This study is intended to investigate the different characteristics of the budgeting process used by medium and large companies operating in Brazil, considering planning, execution, evaluation, and cross-sectional characteristics. This study addresses the budgeting process holistically, considering the companies' budget profiles.

Method: a survey addressed a final sample of 109 medium and large companies. Data analysis included factor analysis and cluster analysis.

Results: by combining the planning, execution, and evaluation dimensions, and cross-sectional aspects, the cluster analysis suggests that different characteristics reveal different levels of maturity of the companies' budgeting process, namely: Budget only as a discourse, Almost planning, Embryonic budget, Budget with a static planning structure, and Budget with a flexible structure.

Contributions: This study proposes insights regarding the level of maturity of medium and large companies, promoting a reflection upon how to improve the budgeting process (dimensions), broadening or restricting the functions of budgeting within companies.

Keywords: Budget; Budgeting Characteristics; Functions of Budgeting; Configurational Approach.

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1. Introduction

In recent years a large body of literature in the management accounting field has taken different perspectives of the budgeting process, considering its dimensions or antecedents or consequents on companies (Covaleski, Evans, Luft, & Shields, 2003; Shields, 2015; Silva &Lavarda, 2014; Frezatti, Aguiar, Guerreiro, &Gouvea, 2011). Studies discuss the effect of contingent factors such as size, strategy, lifecycle, or the effect of uncertainties on budgets (Hansen & Van der Stede, 2004; Frezatti, Relvas, Nascimento, Junqueira, &Bido, 2010a) and the impact of its design and use on attitudes, behavior, and performance (Chapman &Kihn, 2009; Merchant, 1981).

Previous studies investigate some of the budgeting process characteristics, such as the extent to which managers participate in its planning (Shields & Shields, 1998; Brownell & Dunk, 1991), difficulty in achieving budgetary objectives (Merchant & Manzoni, 1989), number of revisions (Merchant, 1981; Van der Stede, 2001), and its use for performance evaluation (Arnold &Artz, 2019; Hartmann, 2000) and rewards (Aguiar, Teixeira, Nossa, & Gonzaga, 2012). Thus, there is a gap of studies addressing the topic holistically (Sponem& Lambert, 2016). In other words, despite theoretical development and empirical evidence, few studies address budgeting considering its various characteristics simultaneously (Libby & Lindsay, 2010; Frezatti, Relvas, Junqueira, Nascimento, &Oyadomari, 2010b; Dal Magro&Lavarda, 2015; Sponem& Lambert, 2016).

The configurational approach can comprehensively characterize the practical field (Meyer, Tsui, &Hinings, 1993; Doty & Glick, 1994; Miller, 1996), which can provide evidence regarding the different profiles of the budgeting process used by companies. This approach has been used in recent studies in management accounting (Bedford &Malmi, 2015; Kruis, Speklé, & Widener, 2016) and other specific fields, such as family businesses (Dekker, Lybaert, Steijvers, Depaire, &Mercken, 2013). Aguiar, Guerreiro, and Gouvea (2011) report evidence about Brazilian companies' profile, emphasizing strategic planning and budgeting. More recently, Sponem and Lambert (2016) proposed a discussion regarding budget profiles that reflects their multiple characteristics, addressing budget design (e.g., level of formalization or detail) and use (such as variation monitoring, rewarding basis). Even though these studies are relevant to discuss budget profiles, they amount little and fragmented evidence. Thus, evidence regarding other business contexts in which budget is used is needed.

This study aims to investigate the different configurations of the budgeting process used by medium- and large-sized companies operating in Brazil. This survey addresses 11 characteristics related to the planning stage (managers' participation, the importance of action plans, and levels of difficulty to achieving budgetary objectives), execution (variation analysis, revisions, and reforecasts), and evaluation (performance evaluation and rewards), as well as cross-sectional characteristics that permeate the entire process (involvement of senior managers in the budgeting process, level of detail, and formalization). In addition to the characteristics of the budgeting process, this study investigates the roles budget plays and contingent factors (which may be related to this set of characteristics).

Therefore, supported by the characteristics discussed by Sponem and Lambert (2016), this study discusses the characteristics of the budgeting process in the Brazilian context, considering that different configurations may emerge from different contexts. There is evidence that emerging countries are subject to higher levels of risk and uncertainties in the economic and institutional spheres compared to developed countries (Xu & Meyer, 2013). These risks and uncertainties may affect organizations' management mechanisms; for instance, companies will tend to more frequently use flexible budgeting practices and allow for a more participatory process. This study's contributions include evidence regarding budgeting configurations adopted by companies operating in Brazil, providing an overview of a complex and multi-faced practice (Sponem& Lambert, 2016; Frezatti *et al*., 2011; 2010b; Dal Magro&Lavarda, 2015), with implications for the organizations' Management Controls System (MCS) (Bedford &Malmi, 2015; Kruis *et al*., 2016; Malmi& Brown, 2008). Additionally, this study proposes a broader discussion of the budgeting process, complementing Brazilian studies discussing some characteristics regarding budget design and its managerial consequences (Dani, Zonatto, & Diehl, 2017; Zonatto, Nascimento, Lunardi, &Degenhart, 2020), as well as those studies addressing the budgeting process in the context of an organization (Junqueira, Caliman, Frezatti, & Gonzaga, 2018; Mucci, Frezatti, &Dieng, 2016; Hillen&Lavarda, 2020). This study also discusses findings regarding the budgets of companies in specific segments (e.g., Codesso&Lunkes, 2016) by providing evidence about companies operating in different sectors.

This study proposes five clusters representing different configurations, which reveal the characteristics of the budgeting process of companies operating in Brazil, namely: Budget only as a discourse, Almost planning, Embryonic budget, Budget with a static planning structure, and Budget with a flexible structure. Note that, even though the constructs adopted are based on Sponem and Lambert (2016), because they emerge from the field, other profiles were identified and discussed here. In addition to budget design and its uses, this study explores the functions of budgeting and the organizational and environmental characteristics of companies classified in each group. Finally, in addition to a quantitative perspective provided by the cluster analysis, this study addresses executives' perceptions regarding the budgeting process, which will be discussed in each of the five budget profiles that emerged from the field.

2. Literature Review

2.1 Configurational Approach

The configurational approach has contributed to advancements in the management field and is adopted by both seminal (Miles & Snow, 1978; Mintzberg, 1979) and recent studies (Kruis *et al*., 2016; Bedford &Malmi, 2015; Neubaum, Kammerlander, & Brigham, 2019). This approach allows organizations and/or mechanisms to be investigated, such as multidimensional arrangements of multiple components, mechanisms, attributes, or interrelated elements (Dess, Newport, & Rasheed, 1993; Meyer *et al*., 1993; Bedford &Malmi, 2015). In this sense, the configurational approach is used by studies to identify different groups or profiles with heterogeneous characteristics based on a set of organizational attributes or management mechanisms. In other words, the primary assumption of the configurational approach is that components, attributes, and/or organizational mechanisms systematically form groups or arrangements that are limited and stable over time (Bedford &Malmi, 2015). Various terms are used in the organizational literature, such as taxonomies, typologies, archetypes, and organizational characteristics. Note that while taxonomies are based on evidence regarding arrangements perceived in practice, typologies and remaining terminologies usually emerge for theories and constructs, thus, are conceptually developed.

This study is based on the discussion and presentation of a taxonomy that refers to the budgeting process configurations used by medium and large companies operating in Brazil, as it derives from the practical field. Taxonomies are based on an inductive assumption that those configurations emerge from the field, thus, are observed in practice (Meyer *et al*., 1993). Taxonomies allow for more complete descriptions of how mechanisms and respective attributes are interrelated in practice, revealing alternatives regarding the design and use of management mechanisms, such as organizational budgets (Sponem& Lambert, 2016). In addition to proposing taxonomies, the configurational approach is concerned with insights that may support future empirical studies with a predictive nature based on these configurations (Miller, 1996).

Recently, researchers from the management accounting field used the configurational approach to discuss complex management control phenomena, for instance, Leverage control structures (Kruis *et al*., 2016), organizational configurations (Bedford &Malmi, 2015), and budget's design and use (Sponem& Lambert, 2016), to identify design and use profiles of management mechanisms emerging from the practical field.

2.2 Budgeting Process Characteristics

The budgeting process involves a combination of characteristics regarding design and uses (Abernethy & Brownell, 1999; Libby & Lindsay, 2010), which fulfill diverse functions within organizations (Hansen & Van der Stede, 2004), considering its complexity and insertion within an organization's management process (Frezatti, 2009). Previous studies in the budgeting field adopted configurations to discuss typologies and taxonomies of the budgeting process, based on characteristics specifically or holistically addressed (Hopwood, 1972; Merchant, 1981; Abernethy & Brownell, 1999; Van der Stede, 2001; Sponem& Lambert 2016).

Hopwood (1972) discussed budgeting styles considering the use of information for managers' performance evaluation. In this sense, the author defined the budget-constrained, profit-conscious, and non-accounting styles to assess performance.

Merchant (1981), in turn, proposed that budgets in which managers actively participate in the process and the existence of sophisticated formal communications systems be named administrative budget control. Additionally, the author suggests that budgets with the managers' active participation, but with a more informal communication system to be called interpersonal budget control. Van der Stede (2001) discussed the different types of budgets considering the achievement of budgetary objectives, revisions, detail level, deviation tolerance, and the intensity of communication, from which the strict budget control and flexible budget control profiles emerged.

Other characteristics were investigated considering theoretical frameworks and models such as Leverage control (Simons, 1995) and bureaucracy (Adler &Borys, 1996). For instance, Abernethy and Brownell (1999) discussed the diagnostic and interactive use of budgets based on the Leverage control model proposed by Simons (1995). Chapman and Kihn (2009) applied the concepts related to repairability, internal transparency, global transparency, and flexibility emerging from bureaucracy to investigate the facilitator and coercive uses of the budget system.

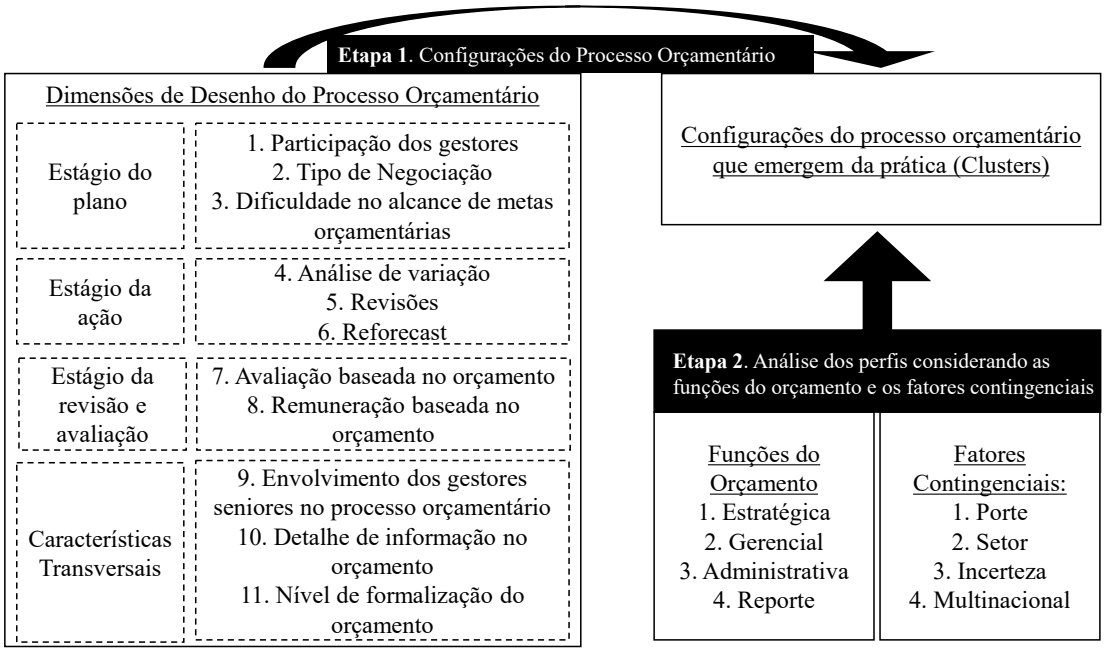
More recently, based on the configurational approach,Sponem and Lambert (2016) discussed the budget's multiple dimensions, which were divided into (i) planning stage (manager's participation, the importance of action plans, and level of difficulty to achieving budgetary objectives); (ii) action stage (variation analysis, revisions, reforecasts); (iii) evaluation stage (performance evaluation and rewards); and (iv) cross-sectional characteristics (level of senior managers' involvement, detail level, and level of formalization). Using the cluster analysis to address these dimensions, Sponem and Lambert (2016) proposed five types of budgeting: the standard budget, characterized by the managers' active involvement and participation on the proposition of goals, and variation analysis, though with a low level of revisions and reforecasting. The coercive budget, characterized by the managers' low participation in the proposition of objectives, negotiation, or revisions and the extensive use of budget to evaluate performance and support reward systems. The interactive budget is distinguished by firmly adhering to the main dimensions presented here (participation and negotiation of budgetary objectives, monitoring, reforcasting, involvement, detail, and formalization), though with a low level of difficulty in achieving budgetary objectives. The flexible budget, which is seldom used to assess performance and rewards, but exhibits a higher level of revisions, and finally, the indicative budget, which exhibits a higher level of managers' participation and involvement, level of detail, and formalization; however, is characterized by a higher level of difficulty in achieving budgetary objectives.

2.3 Theoretical Model

In general, studies discussing budgeting configurations focus on one or some of these device dimensions, except for the study by Lambert (2016), which considered multiple characteristics. This paper seeks to broaden the discussion regarding the design profiles of the budgeting process for other economic, social, and cultural contexts to contribute to the literature and discussion of numerous types of budgets.

In this sense, based on the configurational approach, this paper discusses the profiles of budgets that emerge from the practice of medium and large companies operating in Brazil, considering the planning, action, and evaluation stages, and cross-sectional characteristics, comprising the data analysis of 11 attributes (Step 1) according to Sponem and Lambert (2016). The planning stage refers to planning a budget, which within the traditional logic, usually occurs in the second semester of the year before budget implementation. The planning stage involves operational planning (marketing, production, supplies, overhead expenditure) and financial planning (projection of financial statements) (Frezatti, 2009). The dimensions from the planning stage include the manager's participation in the proposition of budgetary objectives, the establishment of action plans, and in qualitative terms, the level of difficulty assigned to the budget. The action stage reflects budget monitoring *versus* achieved results, called variation analysis, as in the case of areas' and managers' demands, and the revision of budgetary objectives, considering changes in the organization's environment. This evaluation stage usually takes place during budget implementation; followed by specific formal and/or informal rituals, such as reforcasting, considering the current context and future projections, monitoring and assessing the managers' activities, and the achievement of goals established for respective areas, linking these goals to reward systems/gain sharing. Additionally, the model proposed by Sponem and Lambert (2016) defines three characteristics that permeate the stages previously mentioned in the budgeting process, considering the involvement of senior managers, level of information detail, and goals, and level of formalization of the budgeting process in terms of deadlines, procedures, and rituals. These elements of the budgeting process are discussed in textbooks and scientific papers (e.g., Frezatti, 2009; Libby & Lindsay, 2010; Dal Magro&Lavarda, 2015; Sponem& Lambert, 2016).

After establishing the budget profiles based on the 11 dimensions previously presented, these profiles are analyzed regarding the functions of the budgeting process(strategic, managerial, administrative, and reporting). According toSponem and Lambert (2016), budgeting functions comprise: (i) strategic role (strategy implementation, forecasting, financial needs, risk management, and coordination of the business' activities); (ii) managerial role (evaluation, incentives, and commitment); (iii) administrative role (expenses authorization and resource allocation); and (iv) and finally, the role of reporting to external stakeholders. Specifically, based on this study's design we discuss that the characteristics of the budgeting processes of medium and large companies operating in Brazil are guided by the functions of organizations' budgets, and by contingent factors, such as company's size, sector, and level of uncertainty to which companies are exposed, as well as experiences acquired by operating in other countries (Step 2). This joint analysis allows reflecting upon the relationship of these factors with the characteristics of budgeting processes adopted by companies operating in Brazil. Figure 1 presents this study's design.



Translation: Stage 1 Configurations of the Budgeting Process: Design dimensions of the budgeting process: Planning Stage: Managers' participation, Type of negotiation, Difficulty in achieving the budgetary objectives. Action Stage: Variation Analysis, Revisions, Reforcasting, Revision and Evaluation Stage. Budget based evaluation: Budget based remuneration: Cross-Sectional Characteristics, Managers' involvement, Level of information detail, Level of formalization. Configurations of the budget process that emerge from practice (clusters): Stage 2 Analysis of the profiles considering budgeting functions and contingent factors: Budgeting functions: Strategic, Managerial, Administrative, Reporting. Contingent Factors: Size, Sector, Uncertainties, Multinational.

Figure 1. Study design

Note. The design dimensions and functions of the budgeting process are aligned with those discussed by Sponem and Lambert (2016).

This paper is aligned with the literature explaining that managerial practices may vary according to contingent variables (Chenhall, 2003; Otley, 2016). Additionally, when considering the level of uncertainty, size, sector, and international operations, this study intends to capture the context to which companies operating in Brazil are exposed and consequently discuss the effect of this environment in comparison to the characteristics of these companies' budgeting process. Because Brazil is an emergent country, companies face many challenges (from an economic, political, our social nature), which can be captured by the level of uncertainty to which companies are exposed, varying according to the companies' sector or size (Young, Tsai, Wang, Liu, & Ahlstrom, 2014).

3. Method

3.1 Data collection

In this study, a survey was applied among the managers of medium and large companies operating in Brazil. Surveys are one of the main methodological approaches adopted by studies in management accounting (Van der Stede, Young, & Chen, 2005; Speklé& Widener, 2018). The companies' population was established based on two databases: (i) the *Valor 1000* ranking, the companies of which were contacted through LinkedIn; and (ii) a private, professional list of 3,200 e-mails of finance executives. Data were collected from May 2018 to March 2019. A total of 115 complete questionnaires were returned, of which five were excluded for not meeting the size criterion (number of employees below 50), according to the European Union's definition of small, medium, and large companies (European Commission, 2003).

The sample is composed chiefly of large-sized companies in terms of the number of employees (according to the European Union's criteria); 86% of the respondent companies had more than 250 employees. Regarding the companies' sector, the sample mainly comprises companies from the service (44%) and industry sectors (40%). Regarding the respondents' job positions, most were from the fields of finance, management, and accounting (81%) and reported to the administration (54%) and executive boards (37%). In other words, this study's participants occupied high-level positions in the companies' financial area, with a broad view of a mechanism that traditionally covers various organizational areas, such as the budgeting process.

3.2 Instruments Used to Collect Data

The instruments used to collect data were validated and used by Sponem and Lambert (2016). All the instruments' items are rated on a five-point Likert scale, except for reforecast, with has one item addressing the frequency in which reforecastingis usually conducted in the organizations. In total, responses to 30 items were collected.

The following variables were also used to discuss the cluster analysis in the Brazilian context: budgeting functions and contingent characteristics. The same instrument adopted by Sponem and Lambert (2016) was used to identify budgeting functions, including (i) strategic role (strategy implementation, forecasting, financial needs, risk management, and coordination of the businesses' activities); (ii) managerial role (assessment, rewards, commitment); (iii) administrative role (expenses, authorization and resources allocation); and (iv) the role of reporting to external stakeholders.

Regarding contingent characteristics, we used the instrument adapted by Kruis *et al.* (2016), which includes pressure, unpredictability, and environmental uncertainty and comprises a three-item scale. The companies' sectors were separated into industry, trade, or service. Regarding the companies' size, the number of employees characterized the companies as medium or large (European Commission, 2003). Finally, we verified whether the company operated internationally, and in this sense, whether the respondent considered the company to be a multinational company.

Note that at the end of each set of questions addressing the budgeting process, blank spaces were added for the respondents to provide spontaneous comments, which deepened some qualitative aspects of the companies' budgeting process. In this sense, this study incorporates these excerpts into the analysis of each of the five profiles that emerged from practice.

3.3 Data Analysis Procedures

The procedures used to analyze data used included Confirmatory Factor Analysis (CFA), Cluster Analysis (hierarchical and K-means clustering), and a descriptive analysis of each cluster (Hair Jr., Black, Babin, Anderson, & Tatham, 2009).

First, the study's constructs were validated by CFA using SmartPLS 3.0. According to Hair Jr., Hult, Ringle, and Sarstedt (2016), CFA comprises composite reliability and convergent and discriminant validity. Table 1 presents the composite reliability parameters, which are supposed to be above 0.7. Convergent and discriminant validity was verified using factor loadings and the matrix proposed by Fornell and Lacker (Table 1). Average Variance Extracted (AVE) should be above 0.5 to indicate convergent validity. The Fornell and Lacker's matrix enabled to verify discriminant validity of the study's variables; the diagonal values are below those of the diagonal (AVE square root); for instance, the composite reliability of the managers' participation latent variable was 0.918, and AVE was 0.788.

Table 1
Analysis of Fornell and Lacker's Matrix

	1	2	3	4	5	6	7	8	9	10	11
1. Managers' participation	**0,888**										
2. Type of business	0,566	**0,823**									
3. Difficulty in achieving goals	-0,297	-0,316	**0,752**								
4. Variance analysis	0,640	0,682	-0,270	**0,842**							
5. Reforecasting	0,170	0,305	-0,048	0,360	**0,789**						
6. Revisions	-0,210	-0,073	0,120	-0,149	0,186	**1,000**					
7. Performance evaluation	0,425	0,340	-0,121	0,533	0,143	-0,253	**0,838**				
8. Rewards	0,398	0,305	-0,123	0,446	0,034	-0,271	0,653	**0,942**			
9. Executives' involvement	0,728	0,517	-0,176	0,712	0,193	-0,193	0,439	0,466	**0,848**		
10. Level of detail	0,598	0,431	-0,215	0,587	-0,011	-0,270	0,388	0,384	0,726	**0,903**	
11. Level of formalization	0,535	0,409	-0,316	0,494	-0,091	-0,265	0,255	0,273	0,585	0,700	**0,902**
Composite Reliability	0,918	0,722	0,893	0,878	0,762	1,000	0,940	0,876	0,885	0,898	0,897
Average Extracted Variance (AVE)	0,788	0,565	0,678	0,708	0,622	1,000	0,887	0,703	0,720	0,815	0,814

After the CFA, the latent variables' standardized scores were inserted into SPSS® to perform the cluster analysis. Hair Jr. *et al.* (2009) recommended that the hierarchical cluster procedure was performed to establish the number of clusters and identify potential outliers, followed by the non-hierarchical method K-means. The similarity measure chosen was the Euclidian quadratic distance and the cluster method that prioritizes the smallest distance means between all pairs (average linkage). Based on the dendrogram analysis, one outlier was identified (and deleted from the sample) along with plausible solutions of clusters with four or five clusters, considering the dendrogram's cut line and the number of companies per cluster. In this paper, supported by Sponem and Lambert (2016), the K-means clustering analysis with five groups is presented, considering the number of companies per cluster and differences between clusters. Using ANOVA, the five clusters enabled identifying differences in the means between clusters at the 5% level of significance, using ANOVA.

4. Cluster Analysis

Table 2 presents the results of the K-means clustering, considering the solution with five groups. Table 2 indicates the means of standardized factor scores for each cluster and the ANOVA test results, suggesting statistically significant differences between the clusters. Based on the characteristics of each cluster, and according to the literature (Sponem& Lambert, 2016; Hansen & Van der Stede, 2004), we propose a discussion of the following configurations of the budgeting process: (i) Budget only as a discourse (n=9); (ii) Almost planning (n=34); (iii) Embryonic budget (n=18); (iv) Budget with a static planning structure (n=23); and Budget with a flexible structure (n=25). Note that this terminology is discussed based on the characteristics of the budgeting process in each of the clusters and literature addressing the topic (Hopwood, 1972; Merchant, 1981; Abernethy & Brownell, 1999; Van der Stede, 2001; Chapman &Kihn, 2009; Sponem& Lambert, 2016). Figure 2 presents factor scores graphically, enabling visualizing the predominant characteristics within each cluster and distinct characteristics between clusters.

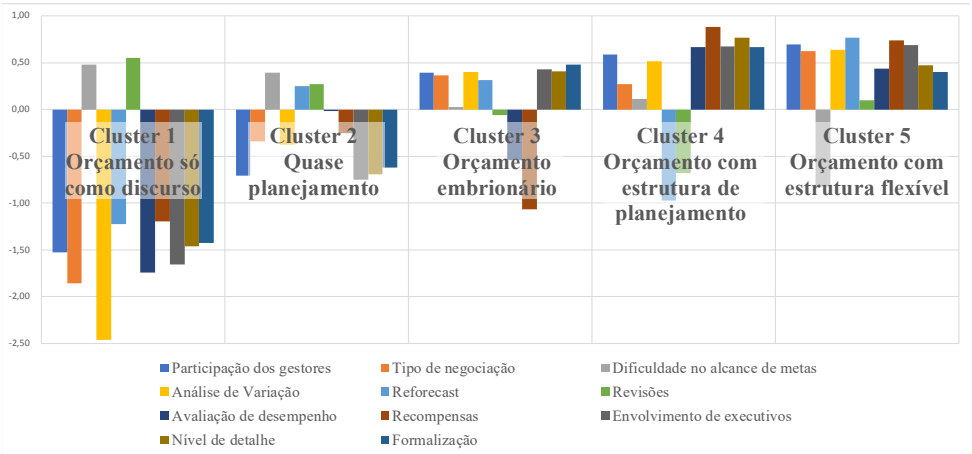
Table 2

Budget's characteristics in the different clusters based on the 11 dimensions

	Cluster 1 **(n=9)**	***Cluster 2*** **(n=34)**	***Cluster 3*** **(n=18)**	***Cluster 4*** **(n=23)**	***Cluster 5*** **(n=25)**	**ANOVA (Sig.)**
Managers' participation	-1,52	-0,71	0,39	0,58	0,70	0,00
Type of Negotiation	-1,86	-0,34	0,36	0,27	0,62	0,00
Difficulty in achieving goals	0,48	0,39	0,03	0,11	-0,83	0,00
Variance analysis	-2,46	-0,38	0,40	0,51	0,64	0,00
Reforecasting	-1,22	0,25	0,31	-0,97	0,77	0,00
Revisions	0,55	0,27	-0,06	-0,68	0,10	0,00
Performance evaluation	-1,74	-0,02	-0,55	0,66	0,43	0,00
Rewards	-1,20	-0,25	-1,06	0,88	0,73	0,00
Executives' involvement	-1,66	-0,75	0,43	0,67	0,69	0,00
Level of detail	-1,46	-0,69	0,40	0,77	0,47	0,00
Level of formalization	-1,43	-0,62	0,48	0,67	0,40	0,00

Note 1. The values presented in the table consist of the mean standardized factor scores for each cluster.

Note 2. The colors differentiate the stages of planning (green), execution (yellow), evaluation (red), and cross-sectional characteristics (gray). Darker colors (for each line) signalize greater adherence to dimensions, while lighter colors (for each line) reflect an absence of dimension in the respective cluster.



Translation: Cluster 1 – Budget only as a discourse. Cluster 2 – Almost budget. Cluster 3 – Embryonic budget. Cluster 4 – Budget with planning structure. Cluster 5 – Budget with a flexible structure. Managers' participation. Variation analysis. Performance evaluation. Level of detail. Type of negotiation. Reforcasting. Rewards. Formalization. Difficulty in achieving goals. Revisions. Executives' involvement.

Figure 2. Budget's characteristics in the different clusters

Note 1. The vertical axis consists of the standardized factor scores means for each cluster. Table 2 presents the means.

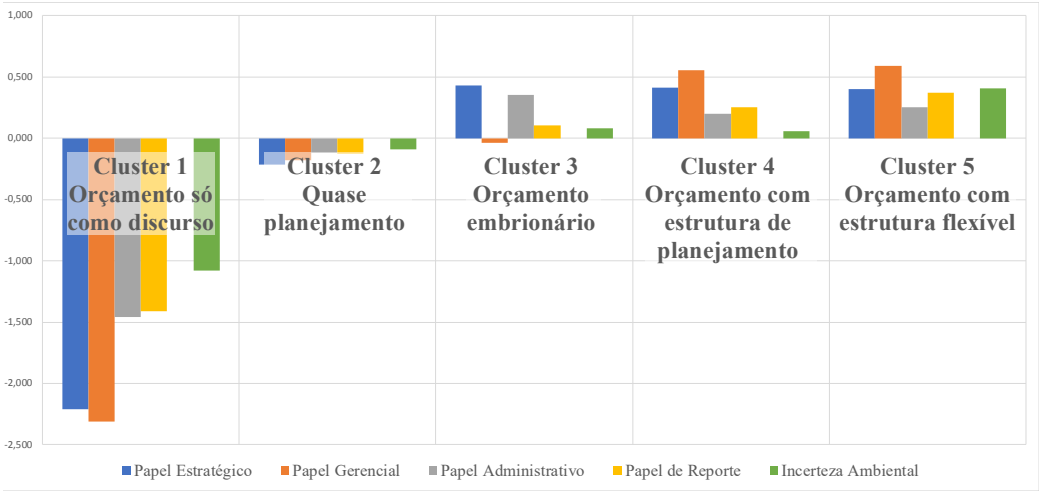
In addition to the dimensions used to develop the configurations of the budgeting process (see Table 2), variables were also used to discuss the characteristics of each group, considering budgeting functions (strategic, managerial, administrative, and reporting), as well as the organizational context in terms of environmental uncertainty, the companies' size and sector, and whether the company is multinational. These characteristics complement the cluster analysis and are represented in Table 3 and Figure 3. There are significant differences between the means of budgeting functions and uncertainty regarding clusters (according to the ANOVA). However, it is impossible to make associations between size, sector, and multinational status with the clusters identified here (see Chi-square test). Therefore, the analysis focused on the attributes that presented differences between the clusters, based on the ANOVA and Chi-square tests.

Table 3

Characteristics of the companies in the different clusters, considering budgeting functions and contingent factors

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Total Geral	ANOVA[1] Chi-square[2]
Budgeting functions[1]							
Strategic	-2,211	-0,217	0,430	0,414	0,400		F=28,397 / sig=0,000
Managerial	-2,313	-0,178	-0,040	0,557	0,592		F=38,608 / sig=0,000
Administrative	-1,460	-0,123	0,353	0,201	0,253		F=7,531 / sig=0,000
Reporting	-1,411	-0,125	0,107	0,252	0,369		F=7,148 / sig=0,000
Environmental Uncertainty[1]	-1,080	-0,093	0,083	0,055	0,404		F=4,177 / sig=0,004
Sector2							
Trade	1	2	0	3	1	7	χ^2= 9,713 sig= 0,286
Industry	1	11	8	9	15	44	
Service	5	17	9	9	8	48	
Missing data	2	4	1	2	1	10	
Size (number of employees)[2]							
Between 50 and 249	4	4	2	3	2	15	χ^2= 17,638 sig= 0,127
Between 250 and 500	1	6	2	7	1	17	
Between 501 and 2000	1	9	8	6	11	35	
Above 2000	3	15	6	7	11	42	
Multinacional[2]							
National	7	23	14	19	15	78	χ^2= 3,790 p-valor= 0,435
Multinational	2	11	4	4	10	31	

Note 1. Confirmatory Factor Analysis was used for budgeting functions and environmental uncertainty variables. The latent variables of budgeting functions presented convergent and discriminant and reliability according to the parameters proposed by Hair Jr. *et al*. (2016). Environmental uncertainty presented convergent and discriminant validity and reliability after excluding three items ("Difficulty to foresee future events impedes the company to establish long-term plans").
Note 2. ANOVA was performed with the latent variables' standardized scores to identify differences between the clusters' means, and Chi-square was used for the qualitative variables to identify potential associations regarding the different clusters.



Translation: Cluster 1 – Budget only as a discourse. Cluster 2 – Almost budget. Cluster 3 – Embryonic budget. Cluster 4 – Budget with planning structure. Cluster 5 – Budget with a flexible structure. Strategic function. Managerial function. Administrative function. Reporting function. Environmental uncertainty.

Figure 3. Budgeting functions and level of uncertainty in the different clusters.

Note 1. The vertical axis consists of the mean standardized factor scores of each cluster. Table 3 presents these means.

4.1Cluster 1: Budget only as a discourse (n = 9)

In Cluster 1, all dimensions of the budgeting process are less frequently adopted, except for the level of difficulty in achieving budgetary objectives (0.48) and the number of budgeting revisions (0.55). When analyzing budgeting functions, it is seldom used to perform its strategic, managerial, administrative, or reporting functions. The conclusion is that these companies adopt other tools to perform these roles. Regarding the environment, the companies in this group operate in contexts with a lower level of uncertainty than those in the remaining clusters. No statistically significant differences were found according to the Chi-square test for the size and multinational status variables.

The manager of a company included in this cluster reported that the budget wasimprecise, based on *feeling*and focused on cash flow, while the manager suggests that the budget is focused on the marketing plan (sales projection). The following managers' excerpts stand out:

> Our budget is very imprecise; it is based on*a feeling*. There is not a process for it in the company. We work on the cash flow based only on significant investments, sales, and purchases (*the respondent from a large-sized company from the wholesale sector*).

> The only operational plan applicable in the company is the marketing plan. According to this respondent, "the company does not have a strong budgeting culture."(*the respondent from a medium-sized company*).

The Budget as a mere discourse dimension is in line with the study by Sponem and Lambert (2016) because it consists of a little-used instrument to monitor, assess performance and rewards, with the low participation of managers, and the development action plans, but mainly it involves a high level of difficulty in achieving goals and a higher number budgeting revisions, compared to the remaining clusters. This cluster somewhat aligns with the non-accounting style in which accounting data are irrelevant to assess cost centers (Hopwood, 1972) and with the interpersonal style, which involves informal controls to monitor performance (Merchant, 1981). Finally, this profile is partially aligned with Cluster 3, proposed by Frezatti *et al.* (2011), considering companies with little emphasis on strategic planning and budgeting.

4.2 Cluster 2: Almost Planning (n = 34)

The budgeting process in Cluster 2 is somewhat similar to Cluster 1 because the companies in this cluster less frequently present most of the dimensions analyzed. In this sense, the companies in this cluster adopt budgets with a higher level of difficulty in achieving goals (0.39), reforecast (0.25), and budgeting revisions (0.27), and an intermediary use of the budget to evaluate performance (-0.02). The companies in this cluster and which reported several reforecasts, reforecasting 3.3 per year on average; two companies reforecasting monthly, 17 companies perform reforecasting three or four times a year, and 12 companies reforecasting two times a year.

Additionally, similar to Cluster 1, the companies in this cluster have a lower level of budgeting participation, the proposition of action plans, use of rewards, and of the budget's cross-sectional characteristics (senior managers' involvement, detail, and formalization). The companies in this cluster do not clearly implement the budget's strategic, managerial, administrative, or reporting functions, presenting lower levels of these functions than the remaining clusters, except Cluster 1. Considering these characteristics, this cluster was called Almost Planning because it applies some of the budget dimensions without any level of commitment toward achieving goals; the budgeting process's functions seem to be innocuous in this cluster.

Regarding the environment, the companies in this cluster operate in a sector with a medium level of uncertainty, suggesting that the use of reforecasts may not be related to the organizational environment, but with the organizations' management model. Additionally, these companies are more frequently large companies operating in the service sector, even though these characteristics are not statistically significant compared to other clusters. This type of budgeting process is in line with the budgeting proposed by Sponem and Lambert (2016), which presents a high level of difficulty in achieving budgetary objectives, but differs in terms of companies using more flexible tools such as reforecasts and budgeting revisions more frequently than average.

4.3 Cluster 3: Embryonic budget (n = 18)

Cluster 3 less frequently uses the budget to evaluate performance (-0.55) or as a basis for rewards systems (-1,06). Additionally, the Embryonic budget presents a low level of difficulty in achieving budgetary objectives (0.03) and budgeting revisions (-0.06). Regarding the other dimensions, this cluster presents a moderate frequency of the managers' participation, action plans, variation analysis, and reforecast dimensions, as well as the involvement of executives and budget's level of detail and formalization.

Regarding budgeting functions, the strategic and administrative functions are relatively highly used, somewhat aligned with the administrative budget control (Merchant, 1981). One manager from a company in the service sector suggests that the budget focuses on predictability and alignment in the long term:

> The modeling the company uses contemplates from 3- to 5-year projections. After this analysis, we separated the first year, which is used in more detail to allocate expenditures limits, action plans, establish priorities, etc. (*the respondent from a large-sized company in the service sector*).

The manager of a large industrial company suggests the budget to be used to manage cash flow, which includes, to a certain extent, reforecasts regarding economic assumptions:

> I also add the importance of working capital as an integral part of financial planning, totally integrated with cash flow projection. Certain companies struggle with economic indicators such as exchange rates, the price of commodities, the harvest of some crops, political issues, etc. (*the respondentfrom a large company in the industrial sector).*

The Embryonic budget dimension more frequently focuses on more realistic goals, using it to guide the manager's decision-making, but not formally using it to evaluate performance or rewards. One of the functions frequently debated in the literature addressing budgeting is the use of this tool to evaluate managers' performance (Hansen & Van der Stede, 2004). This cluster is somewhat close to the flexible budget proposed by Sponem and Lambert (2016), though it differs in variation monitoring and reforecasts while budgeting revisions are less frequently used. The companies in this cluster operate in a sector with a moderate level of uncertainty compared to other clusters; they more frequently operate in the Brazilian market and have more than 500 employees.

4.4 Cluster 4: Budget with a static planning structure (n = 23)

Cluster 4 less frequently adopts flexible budgeting practices, such as reforecasts (-0.97) or budgeting revisions (-0.68). The following excerpts describe a more strict use of the budget in terms of reforecasts and revisions. The managers of the companies in the industrial, financial, and agribusiness companies report the importance of the budget for the planning and control processes:

> The budget rigid development and compliance are essential for a successful budget. (*the respondent of a large-sized company in the industrial sector).*

> Once the Executive Board and Board of directors approve the budget, it is no longer revised/changed. (*the respondent of a large insurance company).*

> The original budget is always maintained because it represents a contract of management goals. (*respondent of a large company in the agribusiness sector).*

The group responsible for the budget with a planning structure is characterized by a high level of involvement of senior executives (0.67), level of detail (0.77), and formalization (0.67), and more frequent use of the budget as a monitoring tool (0.51), and to evaluate performance (0.66) and rewards (0.88). Regarding budgeting functions, higher adherence is observed to the managerial and strategic roles, corroborating that a budget is a relevant mechanism within the managerial control process. The following excerpts suggest the use of budget to monitor and evaluate performance:

> My company's budget is the basis for strategic and operational planning, comparing what is budgeted and achieved. Before the budgeting process, we forecast the current year and project growth for the next. (*the respondent from a large company in the retail trade sector).*

> It [the budget] is a trigger; that is, if we don't comply with the budget, we don't receive bonuses (*the respondent of a medium information technology company).*

The companies in this cluster work in sectors that present a moderate uncertainty level compared to the remaining clusters. This cluster is also heterogeneous in terms of size and sector, with many companies operating in Brazil.The Budget with a static structure is partially similar to the coercive budget proposed by Sponem and Lambert (2016), which is characterized by a lower level of reforcastingand revisions, and at the same time, a moderate level of variation monitoring and performance evaluation. The group of companies characterized in this study with a static planning structure differs from those reported by Sponem and Lambert (2016) because they have a higher level of rewards based on budgetary objectives, and a relatively high number of managers participating in the proposition of goals. The term 'static' is in line with the agency theory in which the budget reflects a commitment of managers with shareholders (seeking to stabilize value, objectives, and aligning interests), while from a coercive perspective, greater emphasis is placed on top-down management.

Traditionally a budget is perceived as a device used for diagnosis control, involving establishing goals, outcomes monitoring, and performance evaluation. In this sense, some similarities were found between this cluster and the following configurations from previous studies: (i) diagnosis use to monitor deviations from the budget and in performance evaluation (Abernethy & Brownell, 1999); (ii) strict and coercive use because it presents a low level of flexibility, expressed in budgeting revisions, high level of detail and formalization, and the strict achievement of budgetary objectives (Van der Stede, 2001; Chapman &Kihn, 2009).

4.5 Cluster 5: Budget with a flexible structure (n = 25)

Cluster 5, Budget with a flexible structure, is aligned with the study by Sponem and Lambert (2016), particularly regarding its high-level of managers' participation (0.70) and definition of action plans (0.62), in addition to a low level of difficulty in achieving budgetary objectives (-0.83). Regarding the execution and evaluation dimensions, this group is characterized by a higher level of budgeting variations (0.64), reforecasts (0.77), and the use for evaluating performance (0,43) and rewards (0.73). Regarding cross-sectional characteristics, greater involvement of senior managers was found (0.69).

On average, the companies in this cluster very frequently present all budgeting functions, i.e., strategic, managerial, administrative, and reporting. The following excerpts reinforce the executives' intense use of the budget:

> Today, our company's budget is the basis for the entire decision-making process; every year, the budget develops even more (...) (*the respondent of a large company in the automobile industry).*

> My company's budget is the primary tool to establish the strategy and monitor its execution (*the respondent from a large company in the energy sector).*

As previously mentioned, the companies in this cluster more intensively use reforecasts, which reinforces the intensive and dynamic use of budgets: "at every significant change in the company or economic context." (*the respondent of a large company in the steel industry*)

In terms of organizational characteristics, the companies in this group are more frequently from the industrial sector and are large companies (above 500 employees) with similar operations in the national and multinational markets. Note that the companies in this group work in an environment with a higher level of uncertainty, and mechanisms such as reforecasts and revisions are essential along with the intensity in which budgets are used in the entire organizational management process. Besides being aligned with Sponem and Lambert (2016), this cluster has similar characteristics of interactive use (Abernethy & Brownell, 1999) and facilitator use (Chapman &Kihn, 2009).

4.6 Discussion of the cluster analysis

Based on the budget configurations identified here, five different groups of attributes that differentiate the clusters were found related to the planning, execution, control, and assessment stages and cross-sectional characteristics. The first cluster reflects cross-sectional characteristics such as formalization, level of detail, and senior managers' involvement. Cross-sectional characteristics are more frequent in Clusters 3, 4, and 5, though they are more apparent in Cluster 4 (Budget with a planning structure). These cross-sectional characteristics are less frequent in Clusters 1 and 2, suggesting that these companies' budgeting process is informal with a low involvement of senior managers.

The second group of characteristics that distinguish the clusters are those related to the planning stage. Clusters 3, 4, and 5 have the participation of managers in the process of goals proposition, and the development of action plans to achieve such goals, with a budget presenting more realistic goals (identified by the level of difficulty in achieving goals). In turn, Clusters 1 and 2 focus on challenging goals, more challenging than expected.

The third reflects the execution and control stages. Note that Clusters 3, 4, and 5 adopt variation analysis, common in the control process, showing that these companies monitor variations between budget and results. Clusters 2, 3, and 5 adopt reforecast, especially the last cluster, whose companies operate in an environment with a higher level of uncertainty (0.404). Regarding budget revisions, they are mainly used by Clusters 1 and 2, in which their budgeting processes are more informal, centralized, and somewhat incipient (due to budgeting functions used by these companies).

The fourth group of characteristics is related to the use of budgeting to assessing performance and rewards. These characteristics are more frequently presented by Clusters 4 and 5, in which the budget's strategic and administrative functions are preponderant, but are less frequently adopted by the remaining clusters, especially Cluster 3, considering that the budget in this cluster's companies plays strategic and administrative roles. This study also shows that the budget configurations are related to two relevant aspects: the function the budget performs in the companies and the level of uncertainty of the company's sector. In general, the strategic function is adopted by the clusters with cross-sectional and planning characteristics (managers' participation and establishment of action plans), i.e., Clusters 3, 4, and 5. The managerial role is present only in clusters in which the budget is used to assess performance and rewards (Clusters 4 and 5), and the administrative function seems to be related to budget monitoring and reforecasts. Reporting is more frequently used in configurations in which there is structure and a higher level of reforecasts (Cluster 5), while these companies operate in environments with a higher level of uncertainty. Hence, this study does not present robust evidence regarding the relationship between contingent factors such as size, sector, whether the company is multinational, and budget profiles.

Finally, even though some clusters are in line with the findings reported by Sponem and Lambert (2016), this study contributes to advanced knowledge regarding the level of environmental uncertainty and its influence on the budgeting process. Therefore, the companies' context is relevant to understand the characteristics of the budgeting process, especially when it refers to an emerging economy.

5. Final Considerations

This study's objective was to investigate the different configurations of the budgeting process used by medium and large companies operating in Brazil, considering the planning, execution, and evaluation stages, and cross-sectional characteristics. In addition to proposing different budgeting design profiles for the Brazilian context, this study discusses the clusters regarding budgeting functions and contingent (internal and external) characteristics and incorporates the executives' perceptions. Using the configurational approach, this study discusses the different profiles of the different budgeting processes, considering stages in which there is no budget (Budget as a discourse only and Almost Budget), Embryonic Budget, and Budget with a planning structure and a flexible structure.

This paper presents additional evidence regarding the findings of studies performed with Brazilian (Frezatti *et al*., 2011; 2010a), French (Sponem& Lambert, 2016), and American and Canadian (Libby & Lindsay, 2010) companies. Additionally, it is aligned with the recommended by Sponem and Lambert (2016, p. 58), that "the replication of studies in a different national context would be useful to broaden the generalization of results". Note this study differs from Sponem and Lambert (2016), considering that the constructs discussed by these authors follow the literature regarding the budget's use, such as the facilitator-coercive use (Adler &Borys, 1996) and diagnostic-interactive use (Simons, 1995), while in this study, we discuss different configurations that reflect the companies' maturity levels. Note that this assessment also includes contextual elements such as environmental uncertainty, not addressed by Sponem and Lambert (2016). Therefore, this study emphasizes the structure of the budgeting process (considering multiple dimensions), the discussion of which reveals different levels of maturity based on budgeting functions, organizational characteristics, and the characteristics of the context in which companies operate. From a practical point of view, this paper presents insight to improve the company's budgeting process, enabling more effective management and decision-making, which can increase the value of organizations for the stakeholders.

These findings are subjected to some limitations. First, this study adopts a descriptive approach to identify the budgeting process characteristics emerging from practice. Additionally, characterization is restricted to the dimensions and the instruments recently validated by Sponem and Lambert (2016). Each cluster is named according to the most evident and distinctive characteristics discussed and compared to evidence reported by previous studies. This study presents organizational level analysis; however, it does not consider different perceptions regarding the budgeting process, i.e., the perceptions of different individuals and/or from different areas within the organizations (Kihn, 2011; Mucci *et al*., 2016).

This study has implications for future research as it extensively considers the types of budgeting adopted by companies operating in Brazil. The configurational approach s researchers and professionals to understand the dimensions of the budgeting practice to reflect upon the dilemmas involved in its process and the use of new tools to enlarge the role of budgeting within organizations. This study presents insights to discuss the maturity of the budgeting process implemented by medium and large companies, promoting a reflection on how to improve the budgeting process (dimensions) and broaden or restrict its functions.

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Appendix 1. Descriptive statistics of the instruments

ID	Instruments	Mean	SD	Median	Min	Max
Planning stage						
Manager's participation						
Part1	The managers play a decisive role in establishing budgetary objectives	3,6	1,0	4	1	5
Part2	Budgetary objectives are established using a bottom-up approach	2,7	1,1	3	1	5
Part3	The managers play an important role in the development of budgets	3,9	1,1	4	1	5
Part4	How important is the role the managers play in the development of budget forecasts?	4,1	1,0	4	1	5
Type of negotiation						
ActP1	The development of action plans is an important stage in the budgeting process	3,7	1,1	4	1	5
ActP2	Action plans are developed by for budgets	2,8	1,2	3	1	5
ActP3	During negotiations, each significant modification in the budget leads to a modification in underlying action plans	3,2	1,2	3	1	5
ActP4	How important is the preparation of action plans related to the budget?	3,8	1,2	4	1	5
Difficult to achieve budgetary objectives						
Dific1	The likelihood of managers achieving their budget goal is low	2,0	1,0	2	1	5
Dific2	Budgetary objectives are usually achieved*	3,8	0,8	4	1	5
Action stage						
Variation analysis						
Variance1	Corrective actions should be proposed by managers when there is a variation between the actual and budgeted performance throughout the year	4,0	1,1	4	1	5
Variance2	Great importance is assigned to the analysis of budgetary variations	4,1	1,0	4	1	5
Variance3	Budgetary variations lead to discussions between the senior managers and the manager in question	4,2	1,1	5	1	5
Revisions						
Revis1	Budgetary objectives cannot be changed throughout the year*	3,1	1,6	3	1	5
Revision and evaluation stage						
Reforecast						
Refor1	The budget is regularly revised to consider environmental changes	3,4	1,3	4	1	5
Refor2	How many times does the companyreforcast the budget per year?	2,8	2,8	2	0	12
Revisions based on budget						
PerfEv1	Not achieving budgetary objectives negatively reflects on performance	4,1	1,1	4	1	5
PerfEv2	Not achieving budgetary objectives significantly impacts the assessment of operational managers' performance.	3,8	1,1	4	1	5
PerfEv3	The performance of operational managersis primarily judged by their ability to meet their budgetary objectives.	3,2	1,1	3	1	5

ID	Instruments	Mean	SD	Median	Min	Max
Remuneration based on budget						
Reward1	Budget-based rewards make up a large proportion of the salary	2,9	1,4	3	1	5
Reward2	The rewards for operational managers largely depend on budgetary objectives.	3,1	1,4	3	1	5
Cross-sectional characteristics						
Involvement of senior managers in the budgeting process						
Involv1	The budgeting process is subject to frequent reviews by managers at all levels	3,7	1,2	4	1	5
Involv2	The budgeting process is subject to frequent and regular reviews by senior managers	4,4	0,9	5	1	5
Involv3	During budget development, there is a large number of discussion between senior managers and operational managers	4,0	1,1	4	1	5
Involv4	The senior management uses budget information to question and discuss the decisions and actions of operational managers	3,9	1,1	4	1	5
Level of information						
Detail1	Analysis of budget variation is performed line by line for each operational manager	3,8	1,2	4	1	5
Detail2	Budget monitoring reports are not very detailed and contain only aggregated data*	2,4	1,3	2	1	5
Detail3	Negotiated budgeting deals with very detailed budgets	3,6	1,2	4	1	5
Level of formalization						
Formal1	The budgeting process is the same for all responsibility centers	3,8	1,3	4	1	5
Formal2	Detailed standards characterize budgeting (budgeting process is highly standardized)	3,9	1,1	4	1	5

Note 1. Items Part2, Variance2, Involv2,and Detail2 were excluded because, according to the factor loading, they did not present convergent or discriminant validity.
Note 2. Both questions and statements were used in the Managers' participation and Type of Negotiation constructs, considering a 5-point scale.
Note 3. A quantitative item was used in the Reforecast construct to express the number of reforcasting is used in a year.
Note4. * Reflect items with a reverse scale.

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The Influence of Formal and Informal Controls and Confidence on Organizational Commitment

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Abstract

Objective: The implications of formal and informal controls and confidence in organizational commitment represent an important gap in the literature due to the potential effect on employees' performance. Even though previous studies report a significant relationship between formal and/or informal controls and confidence and/or organizational commitment, the effect of organizational confidence in this relationship demands further research. Hence, this study's objective was to analyze the influence of formal and informal controls on organizational commitment, mediated by organizational confidence.

Method: A survey was conducted among the managers of the 150 Best Companies to Work For, identified in social media *LinkedIn*. Of the 746 individuals invited, 219 accepted and received a link to the questionnaire; a total of 84 valid responses were obtained. Instruments validated by Goebel and Weißenberger (2017) and Verburg, Nienaber, Searle, Weibel, Hartoge Rupp (2018) were used to measure the constructs. Structural Equations Modeling was used to test the hypotheses.

Results: This study's results show that formal and informal controls influence organizational commitment, and organizational confidence mediation has an indirect effect on this relationship. It indicates that interactions between formal and informal controls with organizational commitment are reinforced by organizational confidence.

Contributions: These results broaden the scope of analysis of the effect of organizational confidence as a factor that enhances the influence of formal and informal controls on organizational commitment. Hence, this study contributes to the joint analysis of these constructs considering evidence of the effect of controls on employees' behavior.

Keywords: Formal and Informal Controls. Organizational Confidence.OrganizationalCommitment.

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1. Introduction

Storey (1985) stressed that the problem of studies related to Management Control Systems (MCS) is not about improving control, but instead how they serve as control devices. From this perspective, Widener (2019) note that studies addressing MCS investigate its planning characteristics, use, and relationship with employees' behavior. One of the primary purposes of management control in decision-making is to align the individuals' behaviors to the organization's goals (Sprinkle, 2003) using formal and informal controls, which constitute an organization's MCS (Otley, 1980).

One of an organization's essential intangible dimensions is the quality of the coordination and coherence of its members' behavior (Guibert & Dupuy, 1997). Tayler and Bloomfield (2011) argue that despite managers using monitoring mechanisms and incentives to induce a given behavior among employees, formal control mechanisms are restricted due to a lack of data precisely indicating how and when these influence and what the psychological motivations are. Regarding this aspect, Khodyakov (2007) highlights that confidence relationships make people less vulnerable in terms of their coworkers' expected behavior (though not mandatory), acting according to the organizations' best interest.

When analyzing how formal and informal controls are related to the MCS and organizational commitment and how these influence organizational performance, Goebel and Weißenberger (2017) verified that informal control mechanisms strongly contribute to the MCS's greater efficacy and organizational commitment levels, which in turn, lead to superior organizational performance. These results indicate a greater dependency of modern organizations on (personal and cultural) informal control mechanisms than (result and action) on formal mechanisms (Goebel & Weißenberger, 2017) and, therefore, their importance as management controls.

It is essential, in this context, to understand the role of individuals in organizations regarding formal and/or informal controls. From this perspective, understanding individuals' organizational commitment and its relationship with organizational confidence is a step ahead of accounting studies, considering that in recent decades, confidence has been emphasized as one of the leading resources promoting organizational performance, as it reflects on the individuals' attitude at work (Baek & Jung, 2015).

Organizational confidence should be considered in managerial practices because it can affect workplace results (Zhang, Tsui, Song, Li & Jia, 2008). Confidence is a latent construct composed of three dimensions: confidence between managers and employees, confidence among coworkers, and organizational confidence (Yandra, 2017). Note that interpersonal confidence (between individuals) differs from organizational confidence because, even though an individual may clearly understand interdependence and the risks associated with dealing with others, these risks are more significant and more ambiguous in the case of an organization (Weibel, Den Hartog, Gillespie, Searle, Six& Skinner, 2016). It is unclear what needs to be judged in terms of organizational confidence, who are those responsible for actions and how these actions make employees vulnerable (Weibel *et al*., 2016).

Investigating "organizational behavior is important because it considers the subjectivity and behaviors of individuals within organizations" (Vieira, Anjos & Silva, 2016, p. 153). In this aspect, Yao, Qiu, and Wei (2019) highlight that organizational commitment is based on formal and informal interactions between individuals and organizations, suggesting a relationship between organizational confidence and commitment. However, Batac and Carassus (2009) note that new issues emerge, such as a search to formalize control, though flexible enough to adjust to environmental changes. Otley (2016) argues that current literature is interested in the effects that different MCS configurations exert on the behaviors of individuals and organizations.

From this perspective, previous studies investigate relationships between one or some MCS Elements and organizational confidence (Weibel *et al.*, 2016; Verburg *et al.*, 2018), organizational commitment(Sholihin&Pike, 2010; Goebel & Weißenberger, 2017),and organizational confidence and commitment (Beuren, Klein, Lara & Almeida, 2016). Other studies analyze the mediator effect of organizational confidence on the relationship between interpersonal confidence and organizational commitment (Baek& Jung, 2015)and the relationship between social and economic exchange with organizational commitment (Ozmen, 2019), as well as the relationship between organizational confidence and commitment (Yandra, 2017). Therefore, the implications of formal and informal controls and employees' confidence with organizational commitment remain a research gap.

Even though previous studies focused on the relationship between the MCS elements and organizational confidence and/or commitment, it remains to be clarified how organizational confidence interferes with their relationship between formal and informal controls and organizational commitment. In this sense, the following research question is proposed: what is the influence of formal and informal controls and organizational confidence on organizational commitment? Hence, this study aims to analyze the influence of formal and informal controls on organizational commitment, mediated by organizational confidence. This study included the managers of the 150 Best Companies to Work For based on the assumption that these companies have structured formal and informal controls with managers involved with confidence and commitment behaviors.

Research in management accounting can help to determine the extent to which social motives, individual values, and the companies' informal controls interact with formal management procedures, ensuring that employees act according to the organization's best interest (Sprinkle, 2003). This study considers the effect of formal and informal controls on employees' behavior. Malmi and Brown (2008) state that the components of an MCS do not work in isolation and the effect of one component should be considered in the context of other MCS components. Considering that some are inherent to accounting and other related areas, it is essential to understand how they complement each other.

This study contributes to the literature by revealing the mediator effect of organizational confidence on the relationship between formal and informal controls with organizational commitment. Otley (2016) highlights that researchers expanded the dependent and independent variables analyzed in the MCS context over the years, giving more emphasis to independent variables than dependent variables. Therefore, this study contributes to studies seeking to show how the relationship of MCS and results is explained by intervening variables, as suggested by Chenhall (2003).

It also contributes to managerial practice as organizations have to understand how confidence and control are related, and how to prevent adverse control effects on confidence (Weibel *et al.*, 2016). These authors consider that MCS is conceived in the literature as the primary way to influence employees' confidence and commitment. By confirming the relationship between formal and informal controls and organizational commitment, mediated by confidence, we draw attention to the fact that the employees' expectations and behaviors should be considered in the MCS context, considering these can enhance organizational confidence.

2. Literature Review

2.1 Formal and informal controls and organizational confidence

Organizational control comprises the specification of patterns to align the employees' actions to the organizations' goals by influencing them to act and make decisions that are consistent with organizational goals (Flamholtz, Das & Tsui, 1985). Organizations use a combination of mechanisms to control peoples' behavior, including supervision of employees, operational procedures standards, descriptions of functions, performance measurement, and reward systems (Flamholtz *et al.*, 1985). In this sense, MCS can be used to control workgroups at all organizational levels.

The of MCS' *raison d›être* is to increase the probability of people internalizing organizational goals and working to achieve those goals (Flamholtz *et al.*, 1985). According to Ansari (1977, p. 102), MCS represents "organizational arrangements and actions designed to encourage its members to perform better with less not-intentional consequences". On the other hand, Sprinkle (2003) highlights that an organization's MCS plays a vital role in motivating employees and improving their judgments and decisions.

MCS configures formal and informal control practices (Verburg *et al.*, 2018). Formal controls include rules, operational procedure standards, and systems intended to ensure that specific results are achieved, involving monitoring, measurement, and corrective actions (Langfield-Smith, 1997). In turn, informal controls include an organization's unwritten policies, which often derive from organizational culture (Langfield-Smith, 1997). Informal controls are important MCS elements, considering that formal controls' effectiveness may depend on the nature of informal controls (Otley, 1980; Flamholtz *et al.*, 1985).

Goebele &Weißenberger (2017) highlight that management controls are intended to meet diversified organizational goals, using formal outcome controls and employees' actions, in addition to informal controls inherent to employees and the organizational culture. The authors explain that formal outcome controls consist of goal indicators to monitor and assess employees' performance, while employee action controls are intended to ensure that activities align with organizational goals, policies, and procedure manuals. Informal personnel controls denote the selection and hiring context, training programs, and employee assessment, while cultural controls comprise organizational standards, beliefs, and values that may influence employee behavior.

However, Guibert and Dupuy (1997) suggest a relationship between the formal and informal management controls. According to them, while formal control is considered a replacement to informal control, the logic of which is to constantly find balance by using one type or another, informal control is based on the principle of complementarity. According to Batac and Carassus (2009), informal management tools can complement instead of replacing traditional (formal) controls.

If strict formal controls may undermine organizational confidence because they reduce employees' autonomy, formal controls may promote reliable relationships. From this perspective, confidence and control complement each other (Khodyakov, 2007). Schoorman, Mayer, and Davis (2007) note that strict formal control may inhibit organizational confidence by suggesting that employees only comply with control demands instead of acting according to honorable intentions.

It is unclear how organizational confidence is related to control (Weibel *et al.*, 2016). Hartmanne & Slapnicar (2009) conducted a study in which they established and tested a model to verify the relationship between formal controls and confidence to verify whether formal controls influence confidence. They found that formal controls of performance evaluations influence interpersonal confidence. Verburg *et al.* (2018) investigated organizational confidence as a result of managerial control and concluded that organizational confidence might result from managerial control, considering it can lead to a perception of organizational zeal, promoting confidence. From this perspective, confidence and control produce each other (Khodyakov, 2007). Therefore, based on the previously mentioned studies, the first hypothesis is proposed:

H_1:Formal and informal controls are positively and significantly related to organizational confidence.

2.2 Organizational confidence and organizational commitment

Confidence in the organizational environment involves various stakeholders, including individuals (confidence in a supervisor or colleague), specific groups (managers, coworkers, work teams/ groups), or the organization as a whole (Schoorman, Mayer & Davis, 2007). Organizational confidence is established between individuals and organizations or the organizational units in which they work (Baek & Jung, 2015). The collective represents organizational confidence, instead of a single person, differing from interpersonal confidence (Weibel *et al.*, 2016).

If organizational confidence means positive expectations regarding an organization (Tan & Tan, 2000), we have to consider the influence of behavioral measures (Baek & Jung, 2015). Confidence derives from the employees' evaluation of whether the organization is competent to achieve goals and fulfill responsibilities reliably (organizational capacity), signalizes positive intentions regarding the wellbeing of stakeholders (corporate benevolence), and adhere to socially accepted moral principles (organizational integrity) in their relationship with different stakeholders (Gillespie & Dietz, 2009; Searle, Den Hartog, Weibel, Gillespie, Six, Hatzakis & Skinner, 2011).

Confidence is critical for organizations (Verburg *et al.*, 2018). It is vital when the work conditions of an organization's members require collaboration (Coletti, Sedatole & Towry, 2005). Confidence intensifies knowledge exchange among workers and promotes cooperation and commitment within organizations (Dirks & Ferrin, 2001; Fulmer & Gelfand, 2012). Trusting employees are more committed and stay longer in organizations, work more intensively, and are more cooperative, sharing knowledge and efficiently solving problems (Weibel *et al.*, 2016).

Therefore, organizations seek to ensure that operations are performed without problems, goals are achieved efficiently, and workers cooperate with managers and with each other (Khodyakov, 2007). However, "an organization may facilitate or hinder the development of commitment" (Arraes, Cabral, Santos, Silva & Penha, 2017, p. 69). Yandra (2017) reports that evidence that confidence is positively related to organizational commitment. Consequently, organizational confidence is a means through which managerial practices can affect workplace outcomes (Zhang *et al.*, 2008).

Lau and Sholihin (2005) found a positive and significant relationship between organizational confidence and job satisfaction, but not between confidence and organizational commitment. SholihinandPike (2010) perform a similar study, however with a different research objective, finding divergent results. They found a positive and significant relationship between confidence and organizational commitment but not between organizational confidence and job satisfaction. Pranitasari (2020) found a positive effect of organizational confidence on organizational commitment and motivation at work. Despite some inconsistencies, these studies results supported the second hypothesis:

H_2:Organizational confidence is positively and significantly related to organizational commitment.

2.3 Formal and informal controls, confidence, and organizational commitment

Chenhall (2003) conducted a systematic review on MCS, suggesting that studies may identify antecedents or demonstrate how the relationship between MCS and outcomes is explained by intervening variables. Studies addressing the relationship between controls and confidence in organizations became relevant in this theoretical debate (Khodyakov, 2007; Weibel *et al*., 2016; Verburg *et al*., 2018), considering that incomplete control measures (e.g., rewards and performance) can motivate dysfunctional behavior (Widener, 2019). The assumption is that employees' level of confidence in an organization can influence their attitudes (Baek & Jung, 2015).

Concerns with individual attributes may be combined with the organizational context, examining compatibility between individuals and their work situation (Chenhall, 2003). A harmonious work environment promotes a greater exchange of information among the individuals of an organization and communication and collaboration, leading workers to help each other in the face of difficulties (Yandra, 2017). Thus, it is likely that personality, cognitive style, and factors associated with commitment and confidence help explain how individuals react to information (Chenhall, 2003).

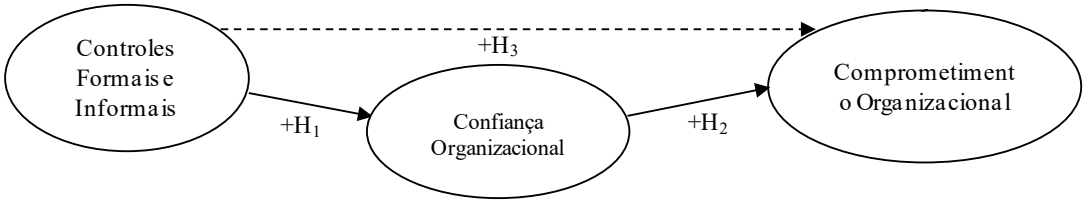
Even though no studies were found addressing the mediator effect of confidence on the relationship between formal and informal controls with organizational commitment, evidence suggests a positive relationship. Hartmann and Slapnicar (2009) verified that formal performance evaluation controls influence interpersonal confidence, mainly because it improves perceived quality in the workers' feedback. Verburg *et al*. (2018) found that quality management controls, directly and indirectly, improve workers' performance due to organizational confidence mediation. It indicates that the relationship between control and confidence is subjected to the way behavior is controlled.

Organizational commitment should be seen as a relationship in which workers tend to act and contribute to organizations (Oliveira &Rowe, 2018). Yandra (2017) states that loyalty to an organization reflects each individual's organizational commitment. Workers who identify themselves with their organizations and are highly committed are more likely to contribute to organizational goals (Davis, Schoorman & Donaldson, 1997; Hernandez, 2008) and promote superior organizational performance (Goebel & Weißenberger, 2017). Yao *et al*. (2019) verified that organizational commitment develops from formal and informal interactions between individuals and organizations, suggesting a relationship between organizational commitment and confidence. Ozmen (2019) found that social and economic exchange relationships with organizational commitment are mediated by confidence.

Considering that previous studies suggest a positive influence of formal and informal controls on organizational confidence (Weibel *et al*., 2016; Verburg *et al*., 2018) and organizational confidence on organizational commitment (Sholihinj & Pike, 2010; Baek & Jung, 2015; Yandra, 2017; Ozmen, 2019), even though some studies did not report a relationship between organizational confidence and organizational commitment (Lau & Sholihin, 2005), in this study, we assume that organizational commitment mediates the relationship between formal and informal controls and organizational commitment. Therefore, the following hypothesis is proposed:

H_3: Formal and informal controls are positively and significantly related to organizational commitment, the relationship of which is mediated by organizational confidence.

Figure 1 presents this study's theoretical model in which the causal relationship between the constructs (independent/ dependent) is highlighted along with the hypothesis.



Translation: Formal and Informal Controls, Organizational Confidence, Organizational Commitment.

Figure 1. Theoretical model

Source: developed by the authors.

Figure 1 represents the theoretical model in which formal and informal controls are positively related to organizational confidence, and organizational confidence is positively related to organizational commitment. The model also predicts that confidence mediates the relationship between informal and formal control and organizational commitment. Previous studies show that, in general, organizations depend on many and different control mechanisms, which in turn should be simultaneously analyzed to verify their respective distinct and relative effects (Goebel&Weißenberger, 2017).

3. Method

This study was conducted through a survey addressing the 150 Best Companies to Work For, 2018 ranking, identified in social media *LinkedIn*. This population was chosen because the employees evaluate the companies that voluntarily subscribe to the annual ranking. Thus, we assume that companies standing out in the management of people and a good organizational environment, from the employees' perspective, tend to enjoy organizational confidence and commitment.

Initially, the companies' names were searched in social media *LinkedIn*, then the companies' lists of employees were verified using the filters' Profile Language' and 'Job Title', defining them 'Portuguese' and 'Manager', respectively. In the absence of workers with a manager job title, analysts, controllers, those responsible for controllership, or supervisors were selected to a maximum of five people per company. The selection of employees in management positions accrues from assuming these employees have sufficient knowledge to answer questions related to the companies' MCS.

After identifying the employees in management positions, the next step was to send an invitation to enter social media *LinkedIn,* created explicitly for this study. Of the 746 invitations sent, 484 were accepted. As the invitations were answered, the individuals were asked about their availability to participate in this study. The link to the questionnaire was sent to the 219 individuals who consented to participate. The questionnaire remained available in Google forms from February to April 2019. Confidentiality of information was ensured. The final sample comprises 84 valid responses, i.e., higher than the minimum sample size of 68 answers, calculated using G*Power, as recommended by Ringle, Silva, and Bido (2014).

Research instruments validated in previous studies were used in this study to measure the study's construct, as shown in Table 1.

Table 1
Study's constructs

Constructs		Description	Authors
Controls	Formal	Formal controls based on explicit and quantifiable standards.	Goebel e Weißenberger (2017)
	Informal	Non-explicit or formal controls, which indirectly integrate a company's controls.	Goebel e Weißenberger (2017)
Organizational confidence		Refers tothe employee perception that an organization is reliable in terms of confidence and goodwill.	Verburg *et al*. (2018)
Organizational commitment		Refers to the employees' commitment and level of identification with the company.	Goebel e Weißenberger (2017)

Source: Developed by the author.

Considering this study's objective, not all constructs presented by Goebel and Weißenberger (2017) were adopted, such as the efficacy of the MCS on organizational performance. Neither were considered all the constructs from Verburg *et al.* (2018): outcome controls, normative controls, performance controls, and behavior controls. All the items used by Goebel and Weißenberger (2017) concerning formal control variables (outcome controls, five items; action controls, five items), informal controls (personnel controls, five items; cultural controls, six items), and organizational commitment (five items) were adopted. To measure organizational commitment, De Verburg *et al.* (2018) used a 10-item instrument to measure organizational confidence.

The instruments were translated from English to Portuguese and back-translated to ensure that the Brazilian version would be equivalent to the original. The number of the scales' items, along with redaction (scales' names), was slightly adjusted, without, however, sacrificing purpose or measurement ability. Hence, the study's instrument comprises 36 statements rated on a five-point Likert scale (Appendix A) so that the respondents would choose the item that better corresponded to their organizations' context. Four questions were added to the instrument to characterize the participants.

According to Curado, Teles, and Marôco (2014), the discussion regarding the scale's number of items in a questionnaire, whether it is even or odd, is irrelevant. Although, they suggest that when seeking or developing an instrument, one should prioritize measures with at least five points to increase the participants' responses and improve the sum of items. When assessing how easy, fast, or precise different scales are, Dalmoro and Vieira (2013) verified that a five-point scale is more appropriate because it is as precise as a three-point scale, but it is easier and faster to process than a seven-point scale.

Collected data were submitted to descriptive statistics and structural equation modeling (SEM) estimated by Partial Least Square (PLS), using Smart PLS. PLS-SEM overcomes the technical limitations of other traditional statistics. According to Ringle *et al.* (2014, p. 57), this technique enables "estimating more complex models with fewer data", with several relationships (HairJr., Hult, Ringle & Sarstedt, 2014), as is the case here. Like Goebel and Weißenberger (2017) and Verburg *et al.* (2018), the basis of variance in the PLS approach was associated with many distinct characteristics that supported this study.

4. Analysis of results

This section presents the results of the statistical procedures. It describes the respondents' profile and then proceeds with the validation of the structural model and measurement model, finally discussing the results. Note that the PLS algorithm is based on the simultaneous calculation of several measurement models, that is, the relationships between indicators and respective latent constructs, in addition to the structural model that quantifies the relationship between these variables (Ringle *et al.*, 2014).

Table 2 presents the respondents' characteristics, highlighting gender, how long the individuals spent in the function, educational level, and background.

Table 2
Respondents' characteristics

Gender	Frequency	%	Education	Frequency	%
Female	21	25%	Bachelor's degree	23	27%
Male	63	75%	Graduate studies	61	73%
			Background	**Frequency**	**%**
Experience in the function	**Frequency**	**%**	Business administration	**22**	**26%**
0 to 5 years	52	61%	Engineering	12	14%
6 to 10 years	15	18%	Accounting	11	13%
11 to 20 years	15	18%	Informatics/IT	7	8%
More than 20 years	2	3%	Social Communication	11	13%
			Other	21	26%

Note: N=84.

Source: study's data.

Table 2 shows that 75% of the respondents were men. Most worked in the position for five or fewer years (61%). Regarding their educational background, most had attended a specialization program. Note that educational backgrounds vary, though most reported Business Administration. This profile suggests the participants were apt to answer the study's instrument, mainly because more than one-third worked in managerial positions for more than five years, and most had a background in the business field.

4.1 Measurement Model

The modeling had a second-order variable (formal and informal controls), composed of four first-order variables (outcome controls, action controls, personnel controls, and cultural controls), the operationalization of which occurred through repetition of indicators (Bido & Silva, 2019). Table 3 presents the criteria to assess convergent and discriminant validity and internal consistency of the first- and second-order latent constructs. Note that the Average Variance Extracted (AVE) and Composite Reliability (CR) of the second-order construct were calculated separately, as explained by Bido and Silva (2019). The second item of the cultural controls was excluded for not meeting goodness of fit requirements.

Table 3

Reliability indicators and construct validity

	Construtos	AVE	CR	AC	1	2	3
	Panel A – VL de primeira ordem						
CF	1. Outcome Controls	0,575	0,871	0,815			
	2. Action Controls	0,692	0,918	0,886	0,741		
CI	3. Personnel Controls	0,744	0,936	0,914	0,707	0,708	
	4. Cultural Controls	0,715	0,926	0,900	0,711	0,694	0,796
	PanelB – LV of the structural model						
COR	1. Organizational confidence	0,663	0,851	0,942			
CORG	2. Organizational commitment	0,666	0,909	0,874	0,881		
CFI	3. Formal and informal controls	0,735	0,917	0,946	0,893	0,833	

Note: LV = Latente variable; AVE=Average Variance Extracted; CR = Composite Reliability; CA = Cronbach's alpha; FC = Formal Controls; IC = Informal Controls;OCO = Organizational Control; OCOM = Organizational Commitment; CFI = Formal and Infomal Controls.

Source: study's data.

Coherent with the confirmatory factor analysis, the items' factor loadings were above 0.60 in their respective constructs, which shows adequacy (Hair Jr., 2014). Internal consistency was verified through Cronbach's alpha (CA) and CR, both with indexes above 0.70 (Hair Jr., Risher, Sarstedt & Ringle, 2019). Convergent validity was verified with AVE, with values above 0.50. Discriminant validity was verified using the heterotrait-monotrait ratio of correlations (HTML) in the last three columns of Table 3, in which the indexes are lower than 0.90 (Hair Jr. *et al.*, 2019).

4.2 Structural model

After assessing the measurement model and validating the constructs, we proceeded with analyzing the structural models' goodness of fit and the study's hypothesis. The first step was assessing convergent validity using the Bootstrapping technique with 5,000 interactions to estimate the significance (p-value) of the relationships between variables and their respective constructs (Preacher& Hayes, 2008; Ringle *et al.*, 2014); that is, the extent to which each construct influences the correspondent construct (Hair Jr. *et al.*, 2014). Table 4 presents the relationships and respective hypotheses.

Tabela 4

Analysis of the structural model and hypotheses

Relationships	Hypothesis	Coef.	t-value	p-value
Formal and informal controls → Organizational confidence.	H[1]	0,855	25,932	**0,000***
Organizational confidence → Organizational commitment	H[2]	0,590	5,120	**0,000***
Formal and informal controls → Organizational commitment	H[3]	0,262	2,208	**0,027****
Formal and informal controls and Organizational confidence → Organizational confidence → Organizational commitment.		0,505	5,013	**0,000***

Note: **p<0.05; *p<0.01.
= Organizational confidence (0.729); Organizational commitment (0.674).
= Organizational confidence (0.468); Organizational commitment (0.434).

Source: study's data.

Coefficients and were used to respectively confirm the predictive relevance and accuracy of the structural model. A higher than zero for a given construct indicates the model's predictive relevance for this construct(Hair Jr. *et al.*, 2014). The closer to 1 (=1), the better the model reflects reality (Ringle *et al.*, 2014). indicates that this model has predictive power, considering its values are higher than zero.

Note that formal and informal controls (FIC) positively and significantly influence organizational confidence (OCO) (H1, coef.=0.855, p<0.01); organizational confidence (OCO) positively and significantly influences organizational commitment (OCOM) (H2, coef.=0.590, p<0.01). Regarding H3, formal and informal controls (FIC) showed a direct effect on organizational commitment (OCOM) (coef.=0.262, p£0.05), in addition to an indirect effect through organizational confidence (OCO) (coef.=0.505, p<0.01). Partial mediation is assumed, considering the direct and indirect effects are significant (Bido & Silva, 2019). Note, however, that the relationship in question is strengthened when mediated by organizational confidence, going from a beta coefficient of 0.262 to 0.505.

4.3 Discussion of results

This study's results show that hypothesis H1, which predicts that formal and informal controls are positively and significantly related to organizational confidence, presents sufficient evidence not to be rejected. These results corroborate with those reported by Hartmann and Slapnicar (2009), indicating that confidence can be achieved through management controls, though the connection between both (controls and confidence) is fragile and depends on how behavior is controlled. These results are also in line with Weibel *et al.* (2016), whose results show that controls are positively related to organizational confidence. The relationship between controls and organizational confidence differs depending on how well controls are implemented; poorly implemented controls can undermine confidence.

According to Sprinkle (2003), management controls play an important role in motivating employees and improving their judgments and decisions. The author argues that because a diversity of individuals composes an organization, employees' wellbeing is inextricably linked to their judgments. While restricted to the individuals' sphere, though in the same direction, Hartmann and Slapnicar (2009) found that interpersonal confidence promotes a positive workplace. In this study, the managers' perceptions agree with the effects of formal and informal controls on the employees' organizational confidence.

Hypothesis H_2, which predicts that organizational confidence is positively and significantly related to organizational commitment, presents sufficient evidence not to be rejected. These results corroborate those reported by Ozmen (2019) and Pranitasari (2020), that there is a positive effect of organizational confidence on organizational commitment. The results also confirm the results reported byYao *et al.* (2019), that a solid basis of mutual confidence between employees and employers is efficacious to keep employees' satisfaction, develop a sense of attachment, belonging, morality, and responsibility toward the organization. The authors state that for confidence and commitment to occur, companies should respect and take care of their employees, establishing a sense of mutual belonging.

The results are also in line with Yandra (2017) regarding the importance of confidence as an informal control element, which explains the positive relationship between control and the behavior of an organization's members. Positive expectations derived from confidence encourage the emergence of positive individual behavior, intensifying individual commitment. Dirks & Ferrin (2001) and Verburg *et al.* (2018) state that confidence is critical for organizations since it intensifies knowledge exchange between employees and promotes cooperation and commitment with organizations.

Zhang *et al.* (2008) found that trustworthy environments can affect management controls. Controls contribute to affirming a company's reputation among stakeholders, which in turn affects employees' confidence. It suggests that an organizational environment conducive to greater confidence determines satisfaction and commitment at work. Weibel *et al.* (2016) highlight that confidence within a company reflects greater commitment among employees, leading employees to spend more time at work, thus, contributing to the company's performance. Therefore, the results regarding hypothesis H2 are in line with the literature.

Finally, hypothesis H_3 predicts that formal and informal controls are positively and significantly related to organizational commitment, whose relationship is mediated by organizational confidence, and obtained sufficient evidence not to be rejected. These results partially agree with Baek and Jung (2015), which analyzed the mediator effect of organizational confidence on the relationship between interpersonal confidence and organizational commitment. Interpersonal confidence promotes organizational commitment only if mediated by organizational confidence.

Goebel and Weißenberger (2017) found that different (formal and informal) control mechanisms are positively and significantly related to organizational commitment, especially action and outcome informal controls. The authors note that jointly considering formal and informal controls provides evidence that the MCS elements are essential to promote the desired behavior among workers and create sustainable value.

Sholihine & Pike (2010) reiterate the significant role of organizational commitment in MCS efficacy. Gualinga and Lennartsson (2020) emphasize that MCS depends on internal factors, such as commitment. Davis *et al.* (1997) and Hernandez (2008) verify that employees who strongly identify themselves with their organizations and present high commitment levels are more likely to contribute to organizational goals. This study's findings revealed that the use of different performance measures, financial and non-financial measures, lead to different behaviors, in this case, organizational confidence and commitment.

The literature draws attention to trade-offs between formal control mechanisms, prone to reward-driven, and formal control mechanisms as a way to identify culture, honesty, and confidence (Yandra, 2017). Hence, confidence is essential when the members of organizations are in a situation at work that requires collaboration (Coletti *et al.*, 2005), showing that a notion of confidence seems to find a balance between formal and informal controls (Guibert & Dupuy, 1997).

The literature reports evidence that formal and informal controls influence the commitment of workers. This study's results align with the literature, as they show the positive effect of these constructs and the mediator role of organizational confidence. Therefore, the perceptions of the managers of the 150 Best Companies to Work For, who took part in this study indicate that there is job satisfaction, and according to the positive and significant relationships found here, the management control adopted is sufficient to impact organizational commitment positively, considering these employees trust the company to which they work.

5. Final considerations

The influence of formal and informal controls on organizational commitment, mediated by organizational confidence, was analyzed in this study. The results show that formal and informal controls positively and significantly influence organizational confidence, while organizational confidence positively and significantly influences organizational commitment. It suggests is that this is how formal and informal controls interact with organizational confidence, and organizational confidence with organizational commitment in the 150 Best Companies to Work For addressed in this study, according to the participants' perceptions.

The results also reveal that organizational confidence mediates the relationship of formal and informal controls with organizational commitment, suggesting that the employees' confidence leads to organizational commitment, which according to Weibel *et al.* (2016), leads workers to stay longer in organizations, work harder and more collaboratively, share knowledge, and solve problems more efficiently. In this aspect, this study's participants report converging perceptions in the context of the companies to each they work for, considering all the hypotheses were confirmed.

Therefore, this study's results contribute to previous literature by reinforcing the positive relationship existing between management controls and organizational confidence (Khodyakov, 2007; Hartmann & Slapnicar, 2009; Weibel *et al.*, 2016; Verburg *et al.*, 2018), and the positive relationship between confidence and organizational commitment (Sholihin & Pike, 2010; Baek & Jung, 2015; Goebel & Weißenberger, 2017; Yandra, 2017; Yao *et al.*, 2019). It mainly reveals that organizational confidence mediates the relationship between formal and informal controls and organizational commitment. This finding is a potential explanation for divergent results report by previous studies.

These results also contribute to the management practice. Once companies understand that employees' confidence in their organization enhances the effectiveness of formal and informal controls on organizational commitment, they can adopt practices that promote organizational confidence and commitment among workers. This way, managers can obtain superior performance from their workers, improving organizational performance. Possibly this is the context in which the best companies work, considering that the relationship of the variables proposed here is positive and significant. The sample characteristics show evidence, considering that most participants work in their respective companies for more than five years, reflecting management controls, commitment, and confidence, as reported in the literature.

This study's limitations encourage further research. Some variables from Goebel and Weißenberger (2017) were not considered here, such as the MCS efficacy, and from Verburg *et al.* (2018), like normative controls. The direction of causality between the constructs was not tested. Thus, future studies can investigate whether formal and informal controls are antecedents and/or consequences of organizational confidence, as suggested by Verburg *et al.* (2018), in addition to the bidirectional relationship between organizational confidence and performance, in line with Xu, Fernando, and Tam (2019). There is also the possibility of exploring the mediator effect of other elements, such as personality traits in the relationship between formal and informal controls and organizational commitment. Note that the study sample comprised only employees in a managerial position, as we assumed they knew the company's MCS, which encourages an investigation of the supporting employees' perception regarding management.

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Appendix A – Research Instrument

1. Formal Controls (Goebel & Weißenberger, 2017, p. 212)

Outcome Controls
Please indicate the extent to which the following statements apply to the establishment and assessment of your company's personnel performance goals.
Scale from 1 (Totally disagree) to 5 (Totally agree).
1. Specific performance goals are established for employees.
2. The achievement of employees' performance goals is controlled by their respective superiors.
3. Potential deviations from performance goals should be explained by the employees' supervisors.
4. The employees receive feedback from their supervisors regarding the extent to which they achieved their goals.
5. The components of variable remuneration are linked to the assigned performance goals.

Action Controls
Please indicate the extent to which the following statements apply to your company's policies and procedures manual.
Scale from 1 (Does not apply at all) to 5 (Applies completely).
6. Supervisors monitor the measures necessary for your employees to achieve performance goals.
7. Supervisors assess how the employees perform an assigned task.
8. Supervisors establish the work steps for routine tasks.
9. Supervisors provide information to employees regarding the most important tasks related to the achievement of performance goals.
10. Policies and procedures manuals establish the fundamental course of the processes.

2. Informal Controls (Goebel & Weißenberger, 2017, p. 212)

Personal Controls
Please indicate the extent to which the following statements apply to specific controls of selection and hiring of employees in your company.
Scale from 1 (Totally disagree) to 5 (Totally agree).
11. Our employees are carefully selected if they fit our organization's values and standards.
12. Much effort has been made to establish the most appropriate recruitment process for our organization.
13. Emphasis is placed on hiring the most suitable candidates for a specific job position.
14. Training and development activities for employees are considered very important.
15. Our employees are given numerous opportunities to expand their range of skills.

Cultural Controls
Please indicate the extent to which the following statements apply to standards, shared beliefs, and values in your company and which may influence your employees' behaviors.
Scale from 1 (Does not apply at all) to 5 (Applies completely).
16. Traditions, values, and standards play an important role in our organization.
17. Great emphasis is given to sharing informal conduct codes among employees.
18. Our mission statement conveys the organization's core values to our employees.
19. Top managers communicate the organization's core values to the employees.
20. Our employees are aware of the organization's core values.
21. Our employees perceive the values encoded in our mission statement as motivators.

3. Organizational Commitment (Goebel & Weißenberger, 2017, p. 213)

Please indicate the extent to which the following statements apply to the employees' commitment and identification with your company from an organizational perspective.
Scale from 1 (Totally disagree) to 5 (Totally agree).
22. Our employees are willing to make a great effort, beyond what is usually expected to contribute to our organization's success.
23. Our employees are very loyal to our organization.
24. There is a high level of congruence between our organization's values and our employees' values.
25. The direction of our organization is significant for our employees.
26. Our employees tell their friends that our organization is a good employer.

4. Organizational Confidence (Verburg *et al.*, 2018, p. 200)

Check your level of agreement with the statements below concerning the perception of your company's employees of whether the company is reliable in terms of its competence and goodwill.
Scale from 1 (Totally disagree) to 5 (Totally agree).
27. The company can fulfill its responsibilities.
28. The company is known to be successful in whatever it attempts to.
29. The company does things with competence
30. The company is concerned with the employees' well-being.
31. The employees' needs and desires are important for your company.
32. The company will do anything to help the employees.
33. The company would never deliberately take advantage of employees.
34. The company is guided by solid moral principles and codes of conduct.
35. Power is not abused in your company.
36. The company does not explore external stakeholders (suppliers, clients, others).

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Articles containing tables or figures, they [the tables and figures] should be in a format that allows them to be edited. In case some of these Figures or Tables have been imported from other programs such as Excel, Power Point etc.., the source file must also be sent as Supplementary File.

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Objective: this study was aimed at investigating the relevance of accounting education and research for the growth of the Brazilian economy during the first decade of the 21st century.

Method: to collect the data, a structured questionnaire was used, elaborated based on the relevant literature. The questionnaire was tested and applied to a sample of Brazilian accountants and businessmen during 2017. In the analysis of these data, content analysis was applied and statistical tests were used to establish relations between the answers obtained.

Results: the main findings of this study indicate that the expansion of accounting education and research in Brazil was essential for the growth of the economy, according to the respondents' perception, despite the impression that accountants and businessmen need to make better use of the accounting information.

Contributions: from the academic viewpoint, the evidences from this research contribute to fill of an important existing gap in the Brazilian literature. What the market is concerned, they contribute by providing evidence that, despite its perceived relevance, its users need to make better use of the accounting information.

Key words: Education: Research; Accounting.

- The article itself, written in Portuguese or English, with at least 5,000 and at most 9,000 words, including tables, figures, notes and references.
- The pages of the articles should be properly numbered in the upper right corner, typed with Word for Windows, under the following conditions:
  - A4 paper (210 x 297 mm);
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3. Tables and Figures[1]

Tables and figures should be used in articles whenever their information make text comprehension more efficient, without repeating information already described in the text.

3.1 Tables

The table should usually show numeric or textual information organized in an orderly exposition of columns and rows. Any other statement should be characterized as textual figure.

The table should be displayed with its information visible and sufficient for their understanding and should be formatted as follows:

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Table editor	Word for Windows 97 or superior. In case authors have drawn their tables in Microsoft Excel or in a similar program, please remake the tables using the feature in Word.
Font	Times New Roman, size 10.
Line spacing	Simple.
Spacing before and after paragraphs	3 pt.
Table colors	Use only black and white (grayscale).
Title	The table title must be brief, clear and explanatory. It should be placed above the table, in the top left corner, and on the next line, just below the word Table (with a capital initial), followed by the number that designates it. The tables are presented with Arabic numerals in sequence and within the text as a whole. Eg: Table 1, Table 2, Table 3, and so on.
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The figure should show a flow chart, a chart, a photograph, a drawing or any other illustration or textual representation.

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