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Editor's Word

Dear reader, I am delivering the second issue of the year 2020. REPeC, always trying to innovate, will start a process of lives with the Revista Brasileira de Contabilidade (RBC). We will have several lives to help Brazilian researchers to enhance the quality of their research and, thus, increase their publications in scientific journals, including REPeC itself.

As promised a year ago, we are always integrating editorials of renowned Brazilian professors and associate editors of the journal, as well as international authors, with very instigating themes to present new ideas and critical thinking to the readers. In this issue, Associate Professor Nerissa Brown of the University of Illinois provides important information, discussing the history of non-GAAP reporting, relevant U.S. and international disclosure guidelines, current trends in practice, and common benefits and pitfalls of non-GAAP disclosures. I believe that there is very little discussion on this subject in our academic environment. In addition, we publish an editorial by psychologist Vitor Barros do Rêgo, M.Sc. on mental health and ethics in times of COVID-19.

After the editorials, first, the article by researchers Edvalda Leal, Layne Ferreira, and Raissa de Farias aims to identify the skills developed in the teaching internship for didactic-pedagogical training through the perception of post-graduate students in accounting and internship advisors/supervisors. The result reveals that the teaching internship can contribute to student education by associating theoretical knowledge with teaching practice, stimulating the development of skills required in teaching. Weaknesses were identified in the pedagogical structure proposed to offer the teaching internship at the post-graduation level.

The second article is authored by Jonatan Konraht, Silvia Consoni, and Marcos da Fonseca, under the title "The relationship between the ownership structure and the leveraged debt cost via debenture issues in Brazil". The results found suggest that, among the property/control structure characteristics analyzed, only the concentration of direct control is relevant for bond holders when pricing the securities.

The third article was written by the authors: Iago Lopes, Alison Meurer and Romualdo Douglas and is entitled "Coping Strategies Adopted by Accounting Students". The main results include that the main associations occur between distraction strategies embodied in doing other more pleasant things and thinking less about the problem and/or the stressful and unpleasant situation, and conversion and additivity, such as the adoption of practices related to the use of licit and illicit drugs.

The fourth article was prepared by Luís Chagas, Ricardo Leal and Raphael Roquete and is entitled "Do good fundamentals generate alphas"" The greatest contribution the authors demonstrated is that portfolios with high F-scores may have less chances of catastrophic returns. The technique applied in the article can be employed by less sophisticated investors to create defensive portfolios of companies with good fundamentals.

The fifth article was elaborated by Eliane Correia, Afonso Lima, and Hong Yuh Ching. The article aims to analyze the relationship between the use of management accounting artifacts and size, performance, and quality of services provided by Brazilian electricity distribution concessionaires, a sector configured as a natural monopoly. The results show a higher usage frequency of traditional artifacts and suggest a relationship between the use of artifacts and the size of the company. However, the use of these artifacts was not related with the performance in the investigated organizations (as opposed to other studies), nor with the service quality. It can be concluded that, in this context of natural monopoly, information obtained through artifacts does not lend itself to the improvement of operations, despite the initiatives of a small number of organizations.

Finally, the authors Nadia Sousa, Mara Jane Malacrida, and Alan Gois (In Memoriam) analyze whether the change in the fair value of derivatives, associated with the adoption of IFRS, affects the market value of Brazilian and global financial institutions between 2005 and 2015. The results showed that it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, affects the market value of Brazilian financial institutions. For the global sample, a relevant relationship was found, at the level of 10%, and it can be argued that the change in the fair value of derivatives, associated with the adoption of IFRS, affects the market value of global financial institutions.

I want to use the opportunity to repeat that REPeC is not only linked to the area of education, but to several areas, as shown in its objectives, namely: Financial, Management, Public, Audit, Taxes, among others.

Without further ado, I thank all the researchers who submitted their articles to REPeC. Congratulations to those who had their articles approved, as the demand is quite high and the road to the final publication is very harsh.

My sincerest thanks, once again, to the readers. I hope you will enjoy this new edition.

Academic greetings.

Gerlando Lima, PhD.
Editor-in-chief.

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Mental health and ethics in times of COVID-19

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The year 2020 has been quite challenging for everyone in the world as a result of the Covid-19 pandemic. The restrictions of movement, contact, and freedom forced us to know and recognize various issues in our life. Some noteworthy ones are our purpose of life and society and our mental health. Therefore, some questions provoke important reflections: why and for what purpose do we produce? How can we maintain our sanity and mental balance in this time of pandemic and atrocities happening?

Our way of producing goods and services has undergone many changes due to this pandemic: families suffered losses in their monthly incomes, the consumption of products and services has become restricted to those considered essential, companies have reformulated their functional frameworks and strategies. Due to changes like these, many male and female workers were subject to even more precarious situations than what they were already experiencing: exposure to risks of contamination, exhausting work journeys, lack of support, excessive punishments, among others (Antunes, 2018). Many report misuse of medications (antidepressants, anxiolytics, muscle relaxants), energy drinks, illicit drugs, body aches, unregulated sleep, difficulty concentrating, and high levels of anxiety (Schimdt et al, 2020). These reports are nothing new. The constant easing of labor laws and modernization of service provision has generated a mass of pseudo-autonomous workers, who believe they own their business but are managed by an algorithm (Antunes, 2018). This is the case for couriers and drivers working through applications. They work long days in order to gain a minimum amount of daily earnings that make it worthwhile for them to go out to work. There are no legal protections, not even of their physical and mental integrity at work.

Before the pandemic, the data on leave and illness at work already appointed frightening results. In 2018, according to the Statistical Yearbook of Occupational Accidents, Brazil had 576,951 reported accidents, just over 19,000 accidents more than the year before (Brazil, 2018). Among these, mental and behavioral disorders rank third as a reason for leave. We will not discuss data here, but rather reflect: **how do you think you contribute to causing illness to the other workers?** The answer is simple: directly or indirectly, yes, when consuming these products and services. Going deeper into these provocations, I ask further questions: Would you stop buying an outfit of a certain brand if you knew that the production line uses slave labor? Would you stop going to a restaurant you like if you knew that owners practice bullying against employees? Would you have a surgery with a doctor if you knew he's been working for 16 hours in a row? Would you take a trip when the driver or pilot of the plane is working on energy drinks and/or stimulant drugs? Knowing the conditions in which pieces of clothing were produced may not change our choices, but how the services are provided do so, also because, in some of the situations, we would be exposed to some risks. Therefore, I argue here that we are going through a crisis that is not only against a virus, but also an ethical crisis of society. We feed a production chain that endangers and exposes workers to borderline situations and that, in some cases, can put their lives at risk. What is scary is the ability to naturalize or even ignore such ethical dilemmas.

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But what does this have to do with our mental health? In the news, there are several manifestations around the world against oppression (racism, machismo, homophobia, xenophobia) and/or abandonment of people left to their own fate without sanitary conditions to face the pandemic. Worrying about the disease, by itself, already puts us in a state of vigilance, causing psychological disturbances that affect the ability to cope with healthy strategies (Ministério da Saúde do Brasil, 2020). The lack of knowledge about the virus, the speed of contagion, the accelerated spread of the virus, the lack of a vaccine, and the lethality above the average of other types of flu (Li et al, 2020) generate anxiety and, for some, panic.

After the Ebola epidemic on the African continent in 2007, the World Health Organization (OMS, 2007), emphasizes the importance of countries being prepared for the effects of a pandemic with good hospital structure and broad access, but also for possible damage to mental health. Recently, WHO (2020) underlined the need to provide psychological assistance and primary care by mental health professionals in the pandemic contingency plan. It is important to emphasize that one of the most effective measures to cope with a pandemic with this level of contagion is quarantine, restricting agglomerations and the free movement of people. The effects of this are losses in social bonds due to distancing, loneliness, fear, boredom, and feelings of emptiness, triggering depressive episodes, anxiety disorders, and suicidal ideas (Barari et al, 2020; Pancani, Marinucci, Aureli & Riva, 2020). Finally, in another WHO document (2000), among several factors that can lead to suicide, unemployment, social violence and lack of access to primary health services may intensify suicidal impulses.

So, how can one keep one's mind sane when watching people die from lack of access to treatment for Covid-19, murdered in their homes by gunfire, murdered because of their skin color, murdered in their villages for defending the nature against mining, murdered for living in an abusive relationship or being harassed for having a religion with African roots? Such social evils gained intensity in times of confinement. According to the Brazilian Public Safety Forum (2020), records of feminicide have grown 22.2% since the beginning of the pandemic. The conclusion I reach is that mental health does not only involve a well-slept night or time for some exercise or stretching, well-prepared food, a few minutes of music, watching series. Mental health also depends on social justice (Dejours, 1999). Being outraged by these atrocities is an initial act to fight for this social justice and, consequently, for mental health. Some are able to follow the reasoning of giving up thinking about it, keeping quiet and pretending that none of this is happening. For this posture, the diagnosis would be another: cynicism, silence and connivance (which, often, are defensive and unconscious postures). These are three social illnesses that feed authoritarian postures, whether of rulers, owners of establishments, or even managers (Costa, 2019; Han, 2017; Dejours, 1999). These are postures that seek to nullify or minimize the suffering of the other, dilute responsibilities for acts or discuss the consequences and not the acts.

The mechanism works as follows in our mind: by being provoked by news reports that expose the evils, the subject may not be affectively capable of coping with it and putting it in a kind of drawer with a key so as not to see it anymore: our unconscious. However, by denying, we are silencing the suffering of those who have lost close people due to illness or social violence. And the more you put facts in this drawer, the more callous and aggressive this person becomes. In fact, this subject is not necessarily diagnosed with some clinical disease but is adopting a pattern of behavior and thinking about himself that causes illnesses to others. Therefore, feeling revolted by these evils also means fighting for one's mental health. After all, do you feel comfortable knowing that a neighbor of yours is being raped in the apartment next door? Or that a poor-class person caught COVID-19 working for an also contaminated person who pays the salary and that the maid died for not having access to health service while the mistress survived?

In the organizational world, many companies have adapted to *compliance* programs as a way to generate credibility and smoothness of internal procedures for their shareholders and customers. However, are these programs concerned with how results and people are managed? Is it normal to present transparency and smoothness with numbers, but at the cost of the mental health of workers who made them through moral and sexual harassment practices? These are considered as one of the factors that most affect cases of work-related suicides (Dejours & Bègue, 2010). It does not seem fair to achieve positive billing results knowing that employees will spend part of their wages on antidepressants, anxiolytics, or other forms of escape from suffering. In fact, this is the worst of confinements.

We need to rethink the way companies produce, but also the way we consume and feed these processes that cause illness and also how we take responsibility for social problems around us. And, in this space of knowledge construction which is the Journal of Education and Research in Accounting, it is also necessary to produce science with ethical purposes, which promotes constructive knowledge and trains professionals with critical knowledge. After all, "without a social end, knowledge will be the greatest of futilities" (Freyre, 1967). Building knowledge that helps to promote social injustice will not be knowledge, but a legitimate tool to destroy mental health.

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Going Public: The Benefits and Pitfalls of Non-GAAP Metrics*

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Going Public: The Benefits and Pitfalls of Non-GAAP Metrics

The use of non-GAAP or adjusted financial metrics is ubiquitous among public firms and has become increasingly common in the financial disclosures of private firms going public. Indeed, recent evidence shows that the use of non-GAAP metrics in the prospectus filings of U.S. initial public offerings (IPOs) has almost tripled over the last two decades. This trend is even more striking for technology[1] IPOs often generate large losses during the early stages of the company's life cycle. For these firms, tailored financial metrics can serve as useful tools to better tell the company's story and to show signals of eventual future profitability. However, the presentation of non-GAAP metrics in prospectus and other disclosure filings can lead to several problems such as lack of comparability with industry peers, misinterpretation by investors, and heightened scrutiny by regulators and the business media. Thus, entrepreneurs and managers need to strike the right balance when choosing to rely on adjusted financial metrics when taking a company public. This article provides key insights by discussing the history of non-GAAP reporting, relevant U.S. and international disclosure guidelines, current trends in practice, and common benefits and pitfalls of non-GAAP disclosures.

* This editorial is based on an executive webinar held in the iMSA program at Gies College of Business at the University of Illinois at Urbana-Champaign. I thank Jessica LoVerde for helpful comments and suggestions. I gratefully acknowledge financial support from the PricewaterhouseCoopers LLP Faculty Fellowship.

1 Consistent with prior research, I use the term "technology" to refer to IPOs in the science, technology, engineering, and math (STEM) industries (see Brown et al. 2020; Fedyk et al. 2017).

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What is a Non-GAAP Financial Measure?

A non-GAAP financial metric is a financial performance measure that does not conform to generally accepted accounting principles (GAAP) or international financial reporting standards (IFRS)[2]. These measures adjust a firm's historical or future financial performance by excluding (or adding back) amounts from a comparable measure prepared according to GAAP or IFRS. In most cases, firms will start with GAAP net income or earnings per share and add back expense components that are deemed irrelevant for assessing core financial performance. Common non-GAAP measures are core or adjusted operating income, adjusted earnings per share (EPS), earnings before interest, tax, and depreciation (EBITDA), adjusted EBITDA, free cash flow, and, to some extent, adjusted revenues. In terms of frequency rates, Audit Analytics report that 82% of the S&P 500 disclosed an adjusted operating income measure, while 79% disclosed some type of adjusted EPS measure (Usvyatsky and Coleman 2018).[3]

Note that non-financial and statistical measures (also known as key performance indicators or KPIs) such as number of subscribers, customer churn, and same-store sales are not considered non-GAAP measures as they are not derived directly from a GAAP or IFRS measure. Operating and financial measures disclosed for segment reporting purposes are also excluded as such measures are provided following GAAP or IFRS. Figure 1 depicts the types of measures that fall within the general scope of the non-GAAP definition.

History of Non-GAAP Reporting and the U.S. Regulatory Background

The non-GAAP phenomenon is not new as adjusted financial metrics started to appear in corporate disclosures and equity analyst reports from the mid-1990s (see Black et al. 2018 for discussions of the history of non-GAAP disclosure in U.S. and international capital markets). While the introduction of non-GAAP metrics has been attributed to several factors, the use of these metrics increased dramatically during the Internet or dot-com stock market bubble (Brown et al. 2012)[4] - and became in fashion among technology firms, especially those in technology-related business services such as online information services and computer programming services (Bhattacharya et al. 2004). Many of these firms were young, loss-generating entities with higher-than-average market capitalization. Thus, critics of non-GAAP reporting surmise that the use of adjusted metrics grew out of the need for young, high-growth, technology companies to demonstrate firm value by converting GAAP losses to more palatable measures of profitability.

2 The term "non-GAAP" is used in U.S. regulatory mandates to refer to adjusted financial metrics that do not conform to U.S. GAAP. The same term is used in practice to refer to adjusted metrics that are not prepared under IFRS or other home-country accounting standards. The terms "non-IFRS" or "alternative performance measures (APMs)" are also used in international settings.

3 These statistics are based on information collected from annual earnings press releases issued in 2017.

4 See Figure 2 of Brown et al. (2012) for graphical evidence of the sharp increase in non-GAAP disclosure during the dot-com bubble

During this timeframe, non-GAAP measures were unregulated, low-quality in nature, and perceived as misleading to investors. In the wake of the dot-com crash and several high-profile accounting frauds, U.S. regulators responded with cautionary warnings and legislative mandates to reign in opportunistic non-GAAP practices and enhance the transparency and usefulness of adjusted measures. Specifically, in December 2001, the U.S. Securities and Exchange Commission (SEC) issued a cautionary advice warning investors of the pitfalls of relying on non-GAAP financial metrics. The Sarbanes-Oxley Act of 2002 (Section 401b) further outlined congressional directives aimed at (1) prohibiting the disclosure of misleading non-GAAP metrics and (2) improving transparency by requiring companies to reconcile the non-GAAP metric to the relevant GAAP figure. These directives were later implemented by the SEC under Regulation G, promulgated in January 2003, followed by a series of non-authoritative interpretive guidance published as Compliance and Disclosure Interpretations (C&DIs).[5]

Regulation G applies to all U.S. public companies including cross-listed foreign firms and private firms undergoing an initial public offering. The guidelines apply to all public disclosures or releases containing non-GAAP financial metrics, including disclosures made in print, orally, telephonically, electronically, by webcast, or by any other means. The general mandates of Regulation G prohibit the public disclosure of non-GAAP information that could be perceived as misleading based on untrue or omitted facts and require companies to present the most directly comparable GAAP metric along with a quantitative reconciliation of the differences between the non-GAAP and GAAP metrics. Regulation G also made amendments to specific SEC disclosure rules that govern information furnished to the SEC, such as earnings press releases (see Item 2.02 of Form 8-K) and public firm filings such as periodic quarterly and annual financial reports, as well as IPO registration statements and prospectus filings (see Item 10e of Regulation S-K). These amendments require companies to present the most directly comparable GAAP metric with equal or greater prominence than the non-GAAP metric and to discuss why management views the non-GAAP metric as useful to investors and how the metric is used internally by management in operating the business.[6] Table 1 illustrates the applicable non-GAAP guidelines for all disclosures, as well as SEC filings and information furnished to the SEC on a Form 8-K.

As noted earlier, foreign firms that are cross-listed on U.S. exchanges are subject to the same prohibitions and requirements as Regulation G.[7] These firms are also subject to the Item 10e requirements of Regulation S-K concerning the disclosure of non-GAAP metrics in Form 20-F filings and registration statements for public offerings in the U.S. That is, U.S.-listed foreign firms must provide a quantitative non-GAAP reconciliation and the most directly comparable GAAP metric with equal or greater prominence. They must also discuss why the measure is useful to investors and how the measure is used internally by management.

5 For comprehensive details on Regulation G, see Topic 8 of the SEC Financial Reporting Manual available at https://www.sec.gov/divisions/corpfin/cffinancialreportingmanual.shtml. The initial set of C&DIs on Regulation G was issued in January 2010 and updated in July 2011, May 2016, October 2017, and April 2018. While the C&DIs are non-authoritative, they are generally viewed by practitioners as providing strict guidelines on non-GAAP usage.

6 Note that these requirements do not extend to non-GAAP metrics disseminated orally, telephonically, or via electronic venues such as social media. However, by analogy to the notes to Item 2.02 of Form 8-K, a firm can comply with the Item 10(e) requirements by hyperlinking to the SEC filing, earnings press release, or to the information on the firm's website. See Brown et al. (2019) for further details on non-GAAP disclosures on social media.

7 There are some limited exemptions. Specifically, cross-listed foreign firms are exempt from Regulation G if all of the following three conditions are met: (1) the company's stock or debt securities are listed on an exchange outside of the U.S., (2) the non-GAAP metric is not derived from or based on a measure prepared and presented under U.S. GAAP, and (3) the non-GAAP metric was disclosed outside of the U.S. These exemption criteria will still apply even if the non-GAAP metric is disclosed concurrently or shortly thereafter in the U.S., as long as individuals located in the U.S. are not the intended primary target of the disclosure communication.

International Regulatory Background

The usage of non-GAAP disclosures is more widespread on the international front and companies are afforded much more latitude in how they present and compute these metrics (see Marques 2017 for an overview of non-GAAP practices and disclosure guidance in international jurisdictions such as the United Kingdom, the European Union, Australia, Canada, and South Africa). For instance, the IFRS standard, IAS 33 – *Earnings Per Share*, permits companies to present an adjusted earnings per share (EPS) measure in the notes of the financial statements as long as the metric is accompanied by a quantitative reconciliation and computed using the same number of shares as the standard EPS metric.

As a part of its *Primary Financial Statements* project, the IASB recently proposed to expand the disclosure of certain non-GAAP metrics in the financial statements. The December 2019 Exposure Draft *General Presentation and Disclosures* outlines several proposed standard updates that would permit the disclosure of "management performance measures" in a single note of the financial statements or on the face of the income statement if certain conditions are met.[8] The overarching goal of the proposed amendments is to improve the transparency, credibility, and consistency of non-GAAP communications in international markets by bringing these measures to a single location in the audited financial statements.

The non-GAAP disclosure guidance in the IASB's exposure draft is similar in many respects to the requirements in Regulation G. The definition of management performance measures is in line with the non-GAAP definition discussed earlier, but with one key exception. The IASB's proposed definition is limited to subtotals of income and expenses and scopes out other adjusted financial measures such as adjusted revenues, free cash flows, and adjusted balance sheet measures. Thus, the proposed amendments still leave room for management to disclose other non-GAAP metrics outside of the financial statements. Similar to Regular G, the IASB's proposal mandates that adjusted income and expense subtotals should faithfully represent the company's financial performance and should not mislead investors. Companies must also provide a quantitative reconciliation and discuss how the adjusted measures are useful to investors.

The IASB's proposed guidance also goes beyond Regulation G and tackles several weaknesses that persist in the U.S. regulatory context. First, adjusted metrics disclosed in IFRS financial statements will now be audited as these metrics will be presented under IFRS standards, similar to segment performance measures. Second, the proposed guidance requires firms to separately disclose the income tax effect and the effect on non-controlling interests for each item in the quantitative reconciliation. Lastly, firms must also disclose comparative calculations for the previous fiscal period and provide explanations whenever management changes the computation of an adjusted metric, introduces a new metric, or discontinues the use of a previously-disclosed metric.

8 The proposed IFRS guidance permits companies to disclose a management performance metric as a subtotal in the income statement if the metric: (1) fits into the new proposed structure of the income statement, (2) does not disrupt the presentation of operating expenses based on either the function or nature of the expenses, and (3) is comprised of amounts that are recognized and measured under IFRS standards. Given these strict conditions, the IASB expects that non-GAAP metrics would rarely be presented on the face of the income statement (see paragraph BC165 of the Basis of Conclusions to the Exposure Draft).

In the U.S. context, auditors do not have responsibilities to audit non-GAAP financial metrics since these measures appear outside of the GAAP financial statements. U.S. auditors should, however, read the non-GAAP information disclosed elsewhere in the annual report (e.g., in the MD&A section) and consider whether the information or its presentation is materially inconsistent with information appearing in the financial statements.[9] Audit standard setters in the U.S., namely the PCAOB and the AICPA, are concurrently deliberating the expansion of auditors' responsibilities concerning non-GAAP disclosures contained in annual reports. A sizable proportion of surveyed financial statement users are in favor of expanding these responsibilities. In fact, a 2016 CFA Institute survey reports that 50% of portfolio managers and equity analysts believe that non-GAAP financial metrics should be audited at the same level as GAAP line items.[10]

The opacity of income tax adjustments as well as inconsistencies in firms' non-GAAP calculations over time have posed several challenges for U.S. regulators. The SEC's C&DIs warn that inconsistencies in a firm's non-GAAP computations across time can be misleading to investors.[11] However, research evidence suggests that a sizable number of firms vary their adjustments from year to year, with some firms engaging in this practice for opportunistic reasons. Specifically, Black et al. (2020) find that some firms apply inconsistent non-GAAP computations when they rely on non-GAAP adjustments to meet or beat common earnings benchmarks. Thus, the IASB's effort to require management to explain deviations from prior non-GAAP computations is a welcome change as it should mitigate strategic adjustment behaviors.

The treatment of income tax effects when computing non-GAAP measures is an increasingly thorny issue in the U.S. context. The SEC's C&DIs state that non-GAAP adjustments should not be presented "net of tax", rather income taxes should be shown as a separate adjustment in the non-GAAP calculation.[12] However, despite this guidance, the presentation of income tax effects is the second most common non-GAAP comment received by firms during the SEC's filing review process. Indeed, data collected from the S&P 1500 indicate that 23% of the firms that report a non-GAAP metric do not disclose the income tax effect when reconciling the metric to the comparable GAAP figure (Chen et al. 2019). The data further show that, of the firms that separately report the tax effects of their non-GAAP adjustments, a significant number strategically apply a different tax rate to the earnings adjustments *and not* the GAAP effective tax rate or the firm's statutory tax rate. Given these issues, the more-detailed nature of the IASB's proposed requirement for firms to separately disclose the income tax effect for each reconciling line item is a definite plus for enhancing transparency and consistency in international non-GAAP practices.

9 See PCAOB Audit Standard 2710 – *Other Information in Documents Containing Auditing Financial Statements*. The auditor's responsibilities to read other information such as non-GAAP financial information applies only to information contained in annual reports or other documents to which the auditor devotes attention at the client's request (AS 2710.02). Thus, auditors' responsibilities do not extend to non-GAAP information appearing in earnings press releases, earnings conference calls, and other venues outside of the annual report.

10 About 30% of survey respondents would prefer some level of audit assurance on whether the controls and procedures for calculating and presenting non-GAAP measures are robust. The full CFA Institute report is available at https://www.cfainstitute.org/-/media/documents/article/position-paper/bridging-the-gap-ensuring-non-gaap-and-performance-reporting.ashx.

11 See Question 100.02 of the SEC C&DIs, available at https://www.sec.gov/divisions/corpfin/guidance/ nongaapinterp.htm.

12 See Question 102.11 of the SEC C&DIs, available at https://www.sec.gov/divisions/corpfin/guidance/ nongaapinterp.htm.

The Impact of Non-GAAP Regulation and Guidance

Regulatory efforts in the U.S. have been viewed as being successful in curbing certain non-GAAP abuses and enhancing the transparency and quality of the adjustments made by firms. A wealth of academic research show that the quality of non-GAAP metrics increased significantly after the SEC's 2001 cautionary advice and after the enactment of Regulation G. This body of research also shows that investors place more reliance on non-GAAP metrics in the post-Regulation G era and are less likely to misinterpret these measures. This evidence is broadly consistent with an increase in the quality and transparency of these metrics.[13] Figure 2 presents a timeline of non-GAAP regulation and non-GAAP disclosure quality in the U.S.[14]

Academic evidence on the success of international regulatory efforts is limited since much of the existing guidance is not mandatory or has been enacted only recently. The Australian and New Zealand settings are exceptions as non-mandatory guidelines on non-GAAP disclosures were issued in these countries in 2011 and 2013, respectively, thus allowing for a sufficient post-regulatory period over which to assess the regulatory effects.[15] Studies by Rainsbury (2017) and Yang and Abeysekera (2018) find that the quality of non-GAAP measures improved in these countries following the issuance of non-GAAP guidelines, though the effects are limited given the voluntary nature of the guidelines.

Despite regulatory successes, non-GAAP abuses have ticked up at various points in time, leading regulators to intensify their scrutiny of how these measures are computed and presented to investors. Following the 2008 financial crisis, the usage and prominence of non-GAAP metrics as well as the magnitude of adjustments increased sharply among U.S. IPOs and public firms, sparking renewed concerns by regulators (see Bentley et al. 2018, Brown et al. 2020). These concerns resulted in the SEC issuing multiple warnings in speeches (see e.g., Bricker 2015, White 2015, 2016) and publishing the C&DIs to address a range of issues such as the types of non-GAAP metrics that SEC staff view as misleading, the presentation of the GAAP metric with equal prominence, and the prohibition of certain adjusted per share measures. This resetting of regulatory expectations was largely successful as reports from Audit Analytics indicate that the undue prominence of non-GAAP metrics in earnings press releases declined dramatically after 2016 along with SEC comment letters on this issue (Whalen et al. 2017, Hallas and Usvyatsky 2018).[16]

Non-GAAP Trends in IPOs and Public Firms

The use of non-GAAP measures is pervasive across U.S. and international public firms. Recent statistics from Audit Analytics and PwC indicate that 97% of S&P 500 and 95% of the FTSE 100 disclosed at least one non-GAAP financial metric in annual earnings releases or filings (Usvyatsky and Coleman 2018, PwC 2016a). A more comprehensive analysis of U.S. public firms by Bentley et al. (2018) finds that roughly 50% of all SEC filers disclosed a non-GAAP earnings metric in at least one quarterly earnings release as of 2013. Figure 3 presents these statistics and those discussed below. [17]

13 This research includes Black et al. (2012, 2017), Marques (2006), Heflin and Hsu (2008), and Kolev et al. (2008).

14 This figure is adapted from Ted Christensen's discussion of Hallman et al. (2018) at the 2017 PCAOB Conference. I thank Professor Christensen for sharing this graphic.

15 The Australian Securities and Investments Commission issued *Regulatory Guide 230: Disclosing Non-IFRS Financial Information* in 2011. New Zealand's Financial Markets Authority issued *Guidance Note: Disclosing Non-GAAP Financial Information* in 2013.

16 The percentage of companies that received an SEC staff comment on non-GAAP prominence declined from about 38% in the second half of 2016 to 22% in the first half of 2018.

17 The data sample in Bentley et al. (2018) is comprised of all firms in the Compustat and I/B/E/S universe. The S&P 500 percentage from Audit Analytics is based on annual earnings releases issued in 2017, while the FTSE 100 percentage from PwC is based on data from 2016.

Non-GAAP usage is also common for private firms going public in U.S. capital markets. A recent study by Brown et al. (2020) finds that 61% of the IPOs in 2012 disclosed an adjusted earnings metric in the prospectus, compared to only 23% of the IPOs conducted in 2003. This uptick is quite sharp, representing a 265% increase in non-GAAP usage in IPO registration filings. The trend for technology IPOs is even more striking as roughly 48% disclosed a non-GAAP earnings metric in 2012 compared to 12% in 2003—a fourfold increase in just 10 years. As Brown et al. (2020) documents, the non-GAAP practices of IPO firms diverge significantly from that of already-public firms. Specifically, IPO firms exclude more recurring line items when computing the non-GAAP earnings metric and tend to make earnings adjustments that are not commonly made by public firms. The uncommon adjustments include the exclusion of executive bonuses, acquisition-related expenses, and add-backs of deferred revenues. These practices reflect the greater need for IPOs to signal positive firm value by converting GAAP losses into non-GAAP profits, especially when the firm is generating positive GAAP operating cash flows.

The Benefits and Pitfalls of Using Non-GAAP Metrics

The use of non-GAAP metrics has several pros and cons for firms, especially those that are entering public capital markets for the first time. The following benefits are often put forth by proponents of non-GAAP information and are generally confirmed by academic research.

Shows sustainable or repeatable earnings. Alternative performance measures can provide a useful perspective of a firm's ability to generate repeatable or recurring streams of income. This is especially important for IPO firms that accrue significant amounts of expenses during their growth phase. Table 2 provides a close look at the non-GAAP earnings reconciliations disclosed in the IPO prospectuses of two technology IPOs completed in 2019, Uber and Lyft. Both firms disclosed adjusted EBITDA measures that exclude items deemed transitory or non-recurring, such as restructuring and acquisition-related charges and changes to insurance and regulatory reserves. Adjustments for stock-based compensation also account for a significant proportion of the expenses excluded by both firms, which is not atypical given the extensive use of stock options as a recruiting tool in technology firms and as a way to compensate founders and executives before going public. While some critics view the removal of stock-based compensation from non-GAAP earnings as less-justifiable, there is broad consensus in the academic literature and in practice that adjusting for transitory items is reasonable for demonstrating sustainable earnings. Note that Uber's adjusted EBITDA measures depicted a smoother stream of income over the three-year period compared to the standard GAAP net income figures.

Managers can better tell the firm's story. Non-GAAP metrics not only enable management to signal core, repeatable performance but also allow management to (1) more clearly explain unusual financial effects that are not representative of underlying business trends and (2) better convey financial items that are most important in understanding the company's core operations. Therefore, managers should pay close attention to how they communicate non-GAAP metrics as discussions of why the measure is useful to investors and explanations of the adjustments are key to enhancing investors' ability to understand and use these measures. Discussions of how the adjusted metric is used internally also provide useful insights into how the business is managed; such insights can be difficult to glean from standard GAAP measures.

Removes volatile business effects. Adjusted metrics often remove transitory or non-recurring items that induce volatility in firms' earnings and cash flow streams. The removal of these volatile effects has been shown to enhance investors' ability to forecast firms' future financial performance. Transitory items are, at times, outside of the control of management, and removing these items from GAAP-based performance measures can promote a longer-term view among management. That is, non-GAAP computations can allow management to focus on long-term value-enhancing activities, such as restructurings, without concerns for the short-term costs that might lower financial performance measures. Indeed, research finds that corporate boards are more likely to use adjusted earnings measures for management performance evaluation when GAAP earnings are more volatile (Curtis et al. 2018).

Notwithstanding the benefits discussed above, the use of non-GAAP metrics can pose several problems for firms. The challenges include but are not limited to those discussed below.

Can be perceived as 'window-dressing'. The opportunistic use of non-GAAP measures by some firms has led some investors to be skeptical about management's underlying motives and the value of these measures. Managers can however mitigate such negative perceptions by complying with regulatory guidelines and mandates, communicating adjustments clearly to investors, using consistent non-GAAP computations from period to period, and consistently adjusting for items that decrease and increase the non-GAAP metric. Regulators, standard setters, and practitioners strongly recommend that firms and their audit committees develop non-GAAP disclosure policies to ensure the consistency and transparency of non-GAAP measures (see PwC 2016b, CAQ 2018).

Can confuse novice investors or trigger investor backlash. Studies find that retail or less-sophisticated investors rely more on non-GAAP metrics compared to sophisticated, institutional investors (Bhattacharya et al. 2007). Retail investors are also more likely to misinterpret the adjustments used to compute non-GAAP metrics. These findings are important for public firms with an investor base that tilts towards retail investors. In such cases, management should carefully consider the transparency and consistency of their non-GAAP disclosures to help novice investors better understand the firm's financial performance. While sophisticated investors are less reliant on non-GAAP measures, IPO investors (who are primarily large institutions) appear to use these measures as signals of firm value given the general lack of reliable financial information about private firms outside of the prospectus. But IPO investors can penalize new issuers harshly for aggressive non-GAAP disclosures. Indeed, Brown et al. (2020) find that investors significantly undervalue IPOs that disclose excessive non-GAAP adjustments and that this valuation penalty is more severe for technology IPOs.

Let us revisit the case of Uber and Lyft. As observed in Table 2, Uber's adjusted EBITDA figure for the 2018 fiscal year included five more reconciling line items compared to Lyft's adjusted figure (12 versus 7 line items).[18] Uber also disclosed 11 different non-GAAP financial metrics throughout the prospectus filing, while Lyft presented only 5 non-GAAP figures. Regulators, business media, and the investment community viewed Uber's non-GAAP disclosures as more aggressive and pushing the limits (McKenna 2019). Uber, not surprisingly, trailed its offer price on the first day of trading, closing at $41.57 compared to a final offer price of $45. Lyft, on the other hand, exhibited rising share values during the IPO process and closed at a higher share price on the first day of trading ($78.29 compared to the $72 offer price).

18 Audit Analytics reports an average of nine reconciling line items (including line items with zero-dollar amounts) for adjusted income metrics presented by S&P 500 firms during 2017 (Usvyatsky and Coleman 2018). A benchmark comparison thus suggests that Uber's non-GAAP adjustments were more excessive compared to already-public firms.

Can increase regulatory scrutiny. Given the controversial nature of non-GAAP metrics, companies should be prepared for heightened regulatory scrutiny if they opt to present adjusted financial metrics in their disclosures. As reported by Audit Analytics, issues surrounding non-GAAP measures account for the second-highest number of SEC staff comments during the filing review process (McKeon and Usvyatsky 2018). Again, management should fully comply with regulatory guidelines and adopt robust non-GAAP disclosure policies and controls to mitigate potential costs associated with regulatory scrutiny. In the IPO context, all prospectus filings are subject to SEC staff review and the presentation of non-GAAP measures in the prospectus can raise red flags, resulting in potential delays in the IPO listing. This was the case with Uber's IPO; the company went through a lengthy comment letter review process (six rounds in totals), with many of the comments focusing on Uber's non-GAAP presentations (McKenna 2019).

Lowers comparability across firms. An often-discussed disadvantage of non-GAAP measures is the difficulty in comparing adjusted financial measures across firms. Non-GAAP measures, by their very nature, are not standardized and are individually tailored by management. This can create difficulties for investors to compare the performance of multiple firms. To alleviate these issues, practitioners recommend that firms, including IPOs, try as much as possible to benchmark the non-GAAP calculations and labels of measures commonly used by industry peers (PwC 2014). If the firm's measure deviates from the standard industry computation, then management should clearly explain these deviations so that investors can make the necessary adjustments to make the measures comparable across firms.

Conclusion

Non-GAAP financial metrics are here to stay. The usage is not expected to decline and will continue to increase as more firms find ways to better tell their stories to investors. The quality and transparency of non-GAAP presentations will continue to improve as companies establish robust non-GAAP policies and as regulators and standard setters enhance disclosure guidelines. Non-GAAP financial metrics have general support from regulators and standard setters and many agree that these metrics are useful if disclosed in a disciplined way. As IASB Chairman Hans Hoogervorst notes: "*We do not wish to stamp [non-GAAP] out. […] It gives additional insight.*"[19]

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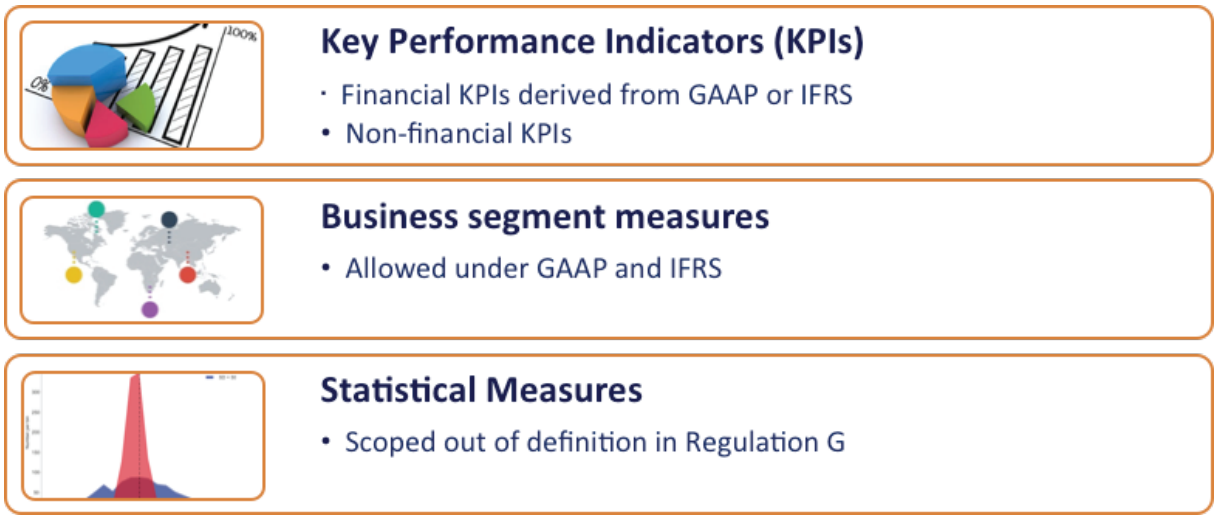

Figure 1. What is (not) a non-GAAP measure?

Note: This illustration is based on the Regulation G definition of a non-GAAP financial metric as outlined in Topic 8 of the SEC Financial Reporting Manual, available at https://www.sec.gov/divisions/corpfin/cffinancialreporting manual.shtml.

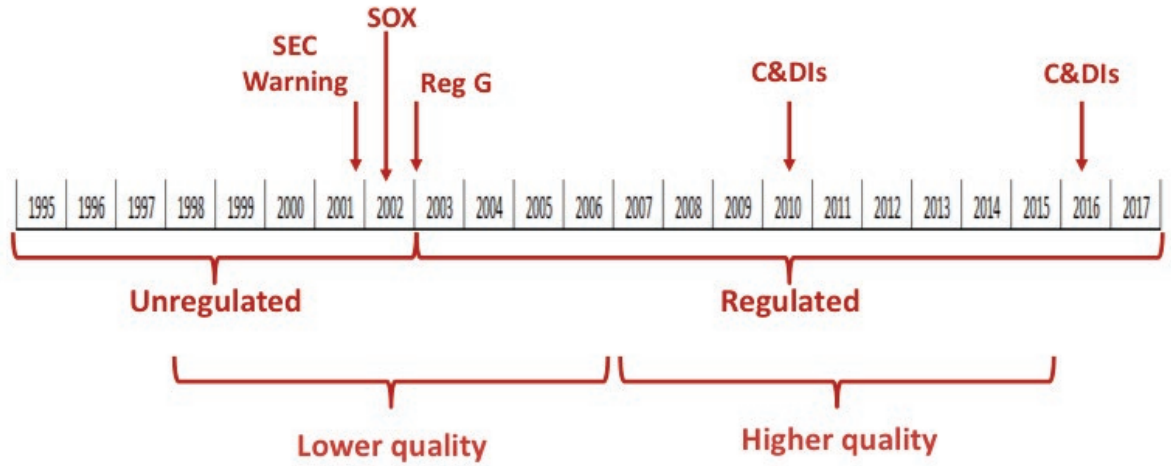

Figure 2. Timeline of U.S. Non-GAAP Regulation and Non-GAAP Quality

Note: This timeline reflects academic research on the quality of non-GAAP measures based on data samples of U.S. firms spanning the period, 1998 to 2015.

95%	97%	50%	61%
FTSE 500	S&P 500	All SEC Filers	U.S. IPOs

Figure 3. Trends in Non-GAAP Usage by IPOs and Public Firms

Note: The S&P 500 percentage is sourced from Audit Analytics and based on annual earnings releases issued in 2017 (Usvyatsky and Coleman 2018). The FTSE 100 statistic is sourced from PwC UK (2016) and based on data collected from annual reports for year-ends between April 2014 to March 2015. The percentage for all SEC filers is taken from Bentley et al. (2018) and based on data collected from quarterly earnings releases for all firms in the Compustat and I/B/E/S databases. The Bentley et al. (2018) data exclude firms that disclose EBITDA measures as this non-GAAP metric was common long before the non-GAAP trend started in the 1990s. The percentage for U.S. IPOs is taken from Brown et al. (2020) and based on data gathered from the prospectuses of book-built IPOs conducted during 2012.

Table 1

U.S. SEC Non-GAAP Guidelines

Where does non-GAAP appear?	Applicable rule
• earnings calls • media interviews • investor roadshows / webcasts • earnings guidance • social media	Regulation G
• earnings press releases	Item 2.02 of Form 8-K
• SEC filings (10-Q/K, IPO filing, etc.)	Regulation S-K (Item 10e)

Non-GAAP requirements	All disclosures	SEC Filings & Form 8-K
Not be misleading	X	X
Most directly comparable GAAP metric	X	X
Quantitative reconciliation to GAAP metric	X	X
Equal or greater prominence of GAAP metric		X
Explain why metric is useful to investors		X
How metric is used internally		X

Note: This regulatory summary of Regulation G is based on the detailed guidelines in Topic 8 of the SEC Financial Reporting Manual, available at https://www.sec.gov/divisions/corpfin/cffinancialreporting manual.shtml.

Table 2

Non-GAAP Earnings Reconciliations for Uber and Lyft IPOs

Uber

	Year Ended December 31,		
	2016	2017	2018
	(in millions)		
Adjusted EBITDA Reconciliation:			
Net income (loss) attributable to Uber Technologies, Inc.	$ (370)	$ (4,033)	$ 997
Add (deduct):			
(Income) loss from discontinued operations, net of income taxes	(2,876)	—	—
Net income (loss) attributable to non-controlling interest, net of tax	—	—	(10)
Benefit from (provision for) income taxes	28	(542)	283
Income (loss) from equity method investment, net of tax	—	—	42
Interest expense	334	479	648
Other income (expense), net	(139)	16	(4,993)
Depreciation and amortization	320	510	426
Stock-based compensation expense	128	137	172
Legal, tax, and regulatory reserves and settlements	49	440	340
Asset impairment/loss on sale of assets	9	340	237
Acquisition and financing related expenses	—	4	15
Restructuring charges	—	7	(4)
Adjusted EBITDA	$ (2,517)	$ (2,642)	$ (1,847)

Lyft

The following table provides a reconciliation of net loss to Adjusted EBITDA:

	Year Ended December 31,		
	2016	2017	2018
	(in millions)		
Net loss	$ (682.8)	$ (688.3)	$ (911.3)
Adjusted to exclude the following:			
Interest income, net	(7.0)	(20.2)	(66.5)
Other income, net	(3.2)	(0.3)	(0.7)
Provision for income taxes	0.4	0.6	0.7
Depreciation and amortization	0.5	2.6	18.8
Stock-based compensation	9.4	9.5	8.6
Changes to insurance reserve attributable to historical periods(1)	17.2	—	3.4
Costs related to acquisitions	—	—	3.5
Adjusted EBITDA	$ (665.5)	$ (696.1)	$ (943.5)

(1) $17.2 million of insurance expense recorded in 2016 reflects changes to reserves estimates of claims from 2015 and earlier periods and $3.4 million of insurance expense recorded in 2018 reflects changes to reserves estimates of claims from 2017 and earlier periods.

Notes: The non-GAAP reconciliations for adjusted EBITDA are taken from the IPO prospectuses of Uber (filed May 13, 2019) and Lyft (filed March 29, 2019).

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The role of teacher training in the development of didactic-pedagogical skills in the context of graduate Accounting programs

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Abstract

Objective: to identify the skills developed in the teacher training for didactic-pedagogical training through the perception of graduate students in accounting and training advisors/supervisors.

Method: the research was conducted in two stages: in the first, two focus groups were held with students from a Graduate Program in Accounting (PPGCC). The second consisted of semi-structured interviews with five teachers of the same program, who served as training supervisors. The data analysis resulted in three categories: the role of the teacher training; the skills and competencies provided by the teacher training; and how the study subjects view the challenges faced during the training.

Results: the teacher training can contribute to the students' education by associating theoretical knowledge with teaching practice, stimulating the development of competencies required in teaching. Weaknesses were identified in the pedagogical structure proposed to offer the teacher training in graduate education.

Contributions: the research contributes to the reflection on the improvement of the teacher training process, by proposing that its educational objectives be clearer and that the graduate programs develop a systematization mechanism of this process, in order to ensure that the student receives proper follow-up from the advisor/supervisor.

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1. Introduction

Various educational studies have focused on the pedagogical training of the teachers in higher education (Ferreira & Hillen, 2015; Nganga; Botinha; Miranda & Leal, 2016; Patrus & Lima; 2014). The main requirement for teaching practice at this level of education was holding a Bachelor's degree and having professional experience (Masetto, 2012). Knowledge in a given area was considered sufficient to teach, which contributed to the recruitment of teachers based on their professional competence (Gil, 2008). Thus, teachers learned to teach through practice and, although this contributed somehow to their becoming teachers, they did not have systematized pedagogical qualification (Pimenta, 2009).

The act of teaching is, therefore, a complex process, as it is not restricted to knowledge about certain content, but also covers aspects such as the students' learning, how this learning will be conducted and the choice of teaching strategies that will enable the teaching-learning process(Zabalza, 2003).

Therefore, training is necessary for teaching practice, which must occur, as a priority, in *stricto sensu* graduate programs, as determined by the Law of Guidelines and Bases of National Education (LDB), 1996. This guideline is also established by the Coordination for the Improvement of Higher Education Personnel (Capes), which justifies the need to offer efficient and high-quality Master's and doctoral programs for the "training of competent teachers who can meet the demand in basic and higher education, while ensuring constant quality improvement" (Capes, 2014).

Nevertheless, Capes itself has promoted a policy that is more focused on training researchers, with less incentive towards teacher training for higher education (Ferreira & Hillen, 2015). In addition, the absence of evaluation indicators that involve teacher training in graduate programs (PPGs) in Brazil makes this scenario even more distant from the idealized, especially in graduate Accounting programs(PPGCCs), as few formal actions are undertaken to qualify Masters and doctoral students for teaching practice (Nganga *et al.*, 2016).

Several studies highlight the graduate programs' focus on the training of researchers to the detriment of training aimed at teaching, emphasizing the need to fill this gap in the didactic-pedagogical training of the teacher who works in Accounting teaching (Andere & Araujo, 2008; Laffin & Gomes, 2014; Lapini, 2012; Miranda, 2010; Miranda, Nganga *et al.*, 2016).

A didactic-pedagogical component the graduate programs have used for teacher qualification is the teacher training or supervised training. The teacher training aims to prepare the graduate student for teaching practice, making the student fit to act in education at the higher education level (Capes, 2014). Nevertheless, Nganga *et al.* (2016) found great heterogeneity in the way the teacher training has been developed in the *stricto sensu* graduate programs in Accountancy.

Based on this context, this study aims to identify the skills developed in the teaching internship for didactic-pedagogical training through the perception of *stricto sensu* graduate students in accounting and the advisors/supervisors of the training.

Among the investigated databases (*Science Direct*, *Redalyc*, Capes Journal Portal, Scielo portal and *Google* Academic), we verified that few studies in the accounting area focused on verifying the pedagogical components offered by PPGCCs (Comunelo, Espejo, Voese & Lima, 2012; Miranda, 2010; Nganga *et al.*, 2016). In these same databases, no research was found that investigated the role of the teacher training within these programs.

Investigating how students and teachers of the PPGCC perceive the teaching skills developed during the teacher training is relevant because the expansion of Higher Education has promoted an increased demand for professionals who are able to work at this level of education. Nevertheless, the way this demand has been met is a source of concern, considering that there is no reasonable assessment of these professionals' training (Santana & Araújo, 2011). Therefore, this study aims to show the contribution of the teacher training in the development of competencies required in teaching. Furthermore, we also expect to contribute for the regulatory entities and educational institutions to review and develop systematic actions that ensure the promotion and valuation of teacher training in the Brazilian PPGs.

The theoretical framework chosen to support this research is the theory of experiential learning developed by David Kolb (1984), combined with the skills necessary for teaching proposed by Zabalza (2003). It should be emphasized that the study did not intend to apply the experiential learning theory in practice, but rather to use its assumptions, as the teaching internship is an experience that can enrich the student's learning process.

2. Theoretical Background

This section consists of discussions on teacher training, teaching internship, and didactic-pedagogical skills, as well as the experiential learning theory.

2.1 Teacher training, teaching internship and didactic-pedagogical skills

Didactic-pedagogical training is a prerequisite for teaching (Masetto, 2012). However, although the responsibility of PPGs for teacher training is established in the LDB, studies in the accounting area reveal that, in these programs, the training of researchers prevails (Andere & Araujo, 2008; Miranda, 2010; Nganga *et al.* 2016). This reinforces the need to expand spaces for higher education teacher training, especially the pedagogical training of bachelors who exercise the teaching activity and do not receive this type of qualification at the undergraduate and graduate level (Hillen, Laffin & Ensslin, 2018; Nganga *et al.*, 2016)

Given this context, teacher training is considered a curricular component linked to the preparation for teaching, being required for Capes Social Demand scholarship students and optional for others, according to MEC/CAPES Decree No. 76/2010. Importantly, *stricto sensu* graduate students engage in this training under the supervision/advice of a teacher who monitors them during that curricular component (Wall, Prado & Carraro, 2008).

Considering the internship as a curricular component capable of contributing to teacher training, this study aims to identify the competencies students in a graduate course in Accountancy develop in this educational space.

The approaches related to teacher training should aim for qualification, enabling them to identify their professional goals, to choose appropriate methodologies, to know the content to be taught, as well as to understand the students' cultural and cognitive orientations (Liston & Zeichner, 1990). Thus, didactic-pedagogical qualification is characterized by teaching knowledge, which serves as a knowledge base for reflexive teaching (Hillen *et al.*, 2018).

Among the various typologies related to teaching knowledge, this study will use the ten competencies proposed by Zabalza (2003, p. 70), which are considered a " set of knowledge and skills that subjects need to develop some type of activity", as presented in Table 1.

Table 1

Competencies necessary for teaching

1) Plan the teaching-learning process	It should consider the legal determinations, the basic contents provided in the course menu, the curricular structure it is part of, the teacher's own view in relation to the discipline and its didactics, the students' characteristics, in addition to the available resources.
2) Select and prepare the disciplinary contents	Choose the most important contents of the discipline so that they meet the students' training needs, adapting them to the conditions of time and resources available so that they are accessible to the students.
3) offer understandable and well-organized information and explanations	Ability to didactically manage the information and/or skills you want to transmit to students in order to make them understandable.
4) Management of new technologies	The new technologies are irreplaceable tools of great value and effectiveness in the management of information for didactic purposes. This competency involves the mastery of teaching techniques, new competencies ranging from the preparation of information to the maintenance of a tutoring relationship through the network.
5) Elaborate the methodology and organize the activities	It involves the various decisions teachers make when managing the development of teaching activities and covers the choice of teaching methodologies, the selection, as well as the elaboration of instructional tasks and the organization of spaces for learning.
6) Communicate and interact with students	This competency involves the ability to work in numerous classes, take on a leadership style as a teacher, and maintain a favorable climate in the classroom.
7) Tutoring	This competency involves the various types of tutoring, as well as the responsibilities of the university tutor, the dilemmas of university tutoring, the conditions of exercising tutoring, and tutoring as a personal commitment of teachers.
8) Evaluate	This competency enables the teacher to know how to evaluate so that he can act as a facilitator in the teaching-learning process. Because of this, the teacher needs to be aware of the nature and purpose of the evaluation in the educational institution, as well as to know the aspects that make up the evaluation and its planning, execution, evaluation, and feedback process.
9) Reflect and investigate on teaching	This competence proposes that teaching itself be the object of analysis. Therefore, it suggests: reflection on teaching in order to make a documented analysis about the teaching-learning process developed; research on teaching, which requires that the various factors affecting university didactics be subject to controlled analyses; and finally, publication on teaching.
10) Identify with the institution and work as a team	This competency involves the ability to know and want to work together in a given institutional context.

Source: elaborated by the authors based on Zabalza (2003) and Puentes, Aquino and Quillici Neto (2009).

Studies on accounting education show the skills considered essential for a good teacher, among which content mastery and didactics stand out (Nogueira, Fadel & Takamatsu, 2012; Rezende & Leal, 2013; Tolentino, Silva, Costa & Neto, 2014), as well as the skills the students expect most (Antonelli, Colauto & Cunha, 2012).

Lapini (2012) studied the forms graduate programs in accounting use for the training of future teachers in the area. In an analysis of 25 courses, the author pointed out three methods the courses use for teacher training: discipline with pedagogical preparation, supervised teaching practice and complementary activities. Based on the analyses performed, Lapini (2012) concluded that the process of continuing education does not exist for accounting teachers, revealing that graduate programs in accounting, in Brazil, do not prepare the student for teaching.

Nganga *et al.* (2016), in turn, identified the curricular components of systematized pedagogical training in the 18 *stricto sensu* graduate programs in Accountancy in Brazil. The results showed that there is a low supply of disciplines aimed at teacher training in these programs, only 14 being linked to teacher training. When offered, these disciplines are generally optional and have a workload of 60 hours or less.

This study seeks to contribute by investigating the training of higher education teachers in accounting, as it seeks to verify the skills developed during the experiential learning process in one of the phases that precedes the entry into the teaching career, which is the teaching internship.

2.2 Experiential Learning Theory and the teaching internship

Professional development, from the perspective of the experiential learning theory developed by David Kolb (1984), occurs when the subject appropriates the experiences lived. This process takes place based on action and continuous reflection, so that the experiences can be improved and incorporated into the individual actions. These experiences can be acquired in the context of the teaching internship, especially those related to the pedagogical training of graduate students.

For the experience to be meaningful, it is important to recognize that knowledge should not simply be shared with people, as it is necessary to encourage them to act in favor of their own learning (Behr & Temmen, 2012). According to the authors, individuals are able to learn better by making discoveries for themselves.

A study developed by Barbosa and Dib (2016) aimed to discuss the process of teacher training by universities, departing from the teacher and student's perspectives and experiences during the teaching internship. The authors concluded that the students who received advice on pedagogical methods performed the teaching internship with greater self-confidence and resourcefulness, being able to conduct the activities in a more didactic and useful way for the stakeholders in the teaching-learning process. This reveals the importance of linking theory and practice in the educational process of future teachers, with a view to qualifying them for higher education.

According to Kolb (1984, p. 38), experiential learning is "the process by which knowledge is created through the transformation of experience. This definition emphasizes (...) that knowledge is a process of transformation, being continuously created and recreated". Therefore, experiential learning encompasses a set of mechanisms that provide people with experiences capable of instigating them to seek learning. To improve learning in higher education, emphasis should be placed on student engagement, so that this process includes *feedback* concerning their learning efforts (Kolb & Kolb, 2005).

In the training context of future higher education teachers, graduate programs started to adopt the teaching internship, in compliance with Decree No. 76/2010, as a way to provide an experience that allows the development of skills necessary for teaching activities, combining theory and practice (Joaquim, Nascimento, Vilas Boas & Silva, 2011; Joaquim & Vilas Boas, 2011; Joaquim, Vilas Boas & Carrieri, 2013; Santos & Helal, 2015).

In this sense, the teaching internship can be associated with experiential learning advocated by Kolb (1984), considering that this curricular component provides the student with a series of experiences that will stimulate him to learn.

Joaquim *et al.* (2011) cite some points to be taken into account when analyzing the process of the teaching internship for the accomplishment of this curricular component to turn into a significant learning experience, both for the student's training and the teacher's reflective practice. The authors list the establishment of "clear and objective criteria of the evaluation methods of the teaching internship and greater feedback to the trainees" p. 1148), "reflexivity in the promotion of learning and knowledge generation" (p.1149) and proximity between supervisory teacher and future teacher as some of the points to be considered in relation to the teaching internship.

The proximity relationship between the supervisory teacher and the student during the teaching internship is fundamental for the student to perform well in that curricular component, as it is in this context that the trainee can think critically and reflexively about the teaching-learning process in which the teaching exercise takes place (Rocha-de-Oliveira & Deluca, 2017). In addition, the approximation between the two subjects (teacher and trainee) permits a process of reflection on the practice, in order to draw conclusions about the various situations experienced in the course of this curricular component.

Although the teaching internship contributes to the graduate student's teacher training, in view of the opportunity that the activity offers to the student to experience the practice of the educational process, some people disagree with the way this curricular component can be conducted. Patrus and Lima (2014) criticize the fact that there are teachers who pass on their responsibilities as undergraduate teachers to their graduate mentees during the teaching internship. According to the authors, the students would take charge of the classes, as well as of the educational process and its evaluation. Thus, the learning process would not be monitored and learning would develop with practice.

Joaquim *et al.* (2011), however, propose that there are five elements that need to be considered in the process of carrying out the teacher training in order to ensure that the contribution of that component to the curriculum in teaching at the Master's level are: (1) Planning the discipline; (2) Professional contact with the teaching activity; and (3) Approximation to and interaction with the chair of the discipline; and (4) Difficulties to be faced in the teaching internship; and (5) Learning and skills acquired in the development of the activities performed.

Based on the teaching internship and experiential learning, this study aims to identify the competencies the students gain in their teaching internship, according to the perception of graduate students and their advisors/supervisors.

3. Methodological Aspects

This study aims to identify which competencies are developed in the teaching internship for teacher training, based on the perception of *stricto sensu* graduate students in accounting and the teachers supervising the internship. Therefore, students and teachers of a graduate program in accounting were investigated through a qualitative approach, whose purpose, for the researcher, is to understand how people interpret their experiences and assign meanings to them (Merriam, 2009).

The study was conducted at a public educational institution in Minas Gerais, which offers the Graduate Program in Accountancy (PPGCC). The investigated program regulates its teaching internship process in Resolution No. 002/2016. This resolution defines the minimum competencies and skills to be developed in the teaching internship I - aimed at Master's students and teaching internship II-aimed at doctoral students.

The evidence in this study was constructed in two stages. To develop the first stage, the *focus group* was used. In this stage, 20 students from the program under analysis were invited, who had already taken the teaching internship. The contact took place via *e-mail*, taken from a list with the students enrolled in the program, received from the course coordination.

After sending the invitation, the 16 students who were willing to participate in the interview were divided into two distinct groups: eight students participated in the group that already had experience with teaching, at the time they took the teaching internship; and eight students composed the group of those who did not have this experience when taking the teaching internship. They were informed in advance of the date, place and time when the interviews would take place.

The interviews were mediated by a visiting professor who works in the business area and who has experience in the application of the data collection instrument. This procedure exempted the researchers from engaging in the focus group, although one of them participated as a listener (observation).

Table 2

Characterization of the focus groups

Description	No teaching experience	With teaching experience
Participants	8 persons	8 persons
Gender	4 male/ 4 female	4 male/ 4 female
Age	23 to 30 years	24 to 47 years
Length of experience with teaching	Does not apply	2 to 10 years
Participated in teacher training (master/doctorate)	8 persons in the master's program	3 in the master's program / 2 in the doctorate/ 3 in both

Source: elaborated by the authors.

The second stage was conducted through semi-structured interviews with PPGCC teachers. They were organized using an interview guide consisting of three key questions: (1) in your opinion, what is the role of the teaching internship for teacher training?; (2) in your opinion, what are the skills and competencies graduate students acquire by participating in the teaching internship?; (3) in your opinion, what are the main challenges the supervising teacher of the teaching internship faces during the teaching internship?

In this stage, the respondents were selected based on the criterion of proximity to the students participating in the first stage, in order to perform a joint analysis on the perception of the two main stakeholders in the teaching stage – supervisor and trainee. Seven professors were invited, five of whom were willing to participate in the study. The interviews were scheduled by *e-mail* and took place via *Skype* with an average duration of 20 minutes. As to the characteristics of the teachers participating in the interviews, there are: 4 female teachers and 1 male teacher, all of whom have already advised / supervised more than two trainees and their research lines are: Governmental, Management, Financial Accounting and Teaching and Research in Accounting.

For the analysis of results, we used the *template* approach proposed by King (2004). In this approach, the evidence is analyzed according to a list of codes the researcher has defined *a priori*. The data are organized hierarchically based on the grouping of similar codes, aiming to interpret and present the evidence in a more organized way. Table 3 shows the codes constructed after reading the transcripts of the five interviews. The *higher-order* codes were produced based on the study objective, while the *lower-order* codes were elaborated based on the ten competencies necessary for teaching proposed by Zabalza (2003), which were detailed in Table 1 and based on the reading of the five interview transcripts. The codes were then grouped according to the higher-order theme, thus facilitating the final analysis.

Table 3
Analysis template

Higher-order codes	Lower-order codes
1. Function of the teacher training	1.1 Practical experience through action 1.2 Practical experience through reflection 1.3 Practical experience through observation 1.4 Practical experience by example
2. Skills and competencies provided by teaching	2.1 Plan the teaching-learning process 2.2 Select and prepare the disciplinary contents 2.3 Offer understandable and well-organized information and explanations 2.4 Management of new technologies 2.5 Elaborate the method and organize the activities 2.6 Communicate and interact with the students 2.7 Tutoring 2.8 Evaluate 2.9 Reflect and investigate on teaching 2.10 Identify with the institution and work as a team
3. Main challenges faced during the teaching internship	3.1 Posture of the trainee 3.2 Skills development 3.3 (Lack of) preparation to serve as a supervisor 3.4 (Lack of) background knowledge of the trainee 3.5 Conduction of the traineeship 3.6 Duration of the traineeship

Source: elaborated by the authors.

About the codes evidenced in Table 3, as well as the transcripts of the interviewees (students and teachers), content analysis was used for the data treatment, in order to confront the participants' statements with the literature that served as theoretical support for the construction of this research. Content analysis allows a survey of indicators (quantitative or not), which permits making inferences about certain knowledge (Cavalcante, Calixto & Pinheiro, 2014).

Among the limitations of the study, the sample stands out, considering that the research was conducted in a single PPGCC, which makes it impossible to generalize the results. In addition, the study was submitted to the Ethics Committee in Research involving Human Beings of the institution where it was conducted, and its implementation was approved according to CAAE opinion: 93336218.7.0000.5152. Finally, in the next section, some excerpts from the interviews and focus groups conducted will be analyzed and discussed. To maintain the confidentiality of the study participants, the letters D and E will be used to identify the teachers and trainees, respectively, followed by a separate number to identify each subject.

4. Analysis and Discussion of the Results

In this section, the evidence found based on the three first-order codes will be presented.

4.1 Function of the teacher training

When constructing the subcategories of the analysis, it was verified that the main function of the internship is to provide the practical experience of teaching to students through action, reflection, observation, and the example the supervisors give during this process, whether positive or negative. Among the four subcategories in this topic, the statements that stood out show opportunities linked to practical experience and reflection on the practice as the main functions of the internship.

The teaching internship, when offered by the graduate programs, allows students to experience the various activities higher education teachers engage in, including the planning of the teaching-learning process, the application of teaching strategies, and the elaboration and application of evaluation activities. This practical function of the internship emerges in the supervisors' discourse, as illustrated in the following excerpt.

> [...] I think it is an opportunity that students have to experience in practice the activities that a teacher needs to develop. So, they have the possibility to understand the planning of a class, how the subject and the content can be distributed during the classes. They also have the opportunity to develop some strategies to apply this content, as well as to accompany the evaluation processes, the questions of the activities, or even the individual evaluations (D3).

It is worth highlighting the view of one supervisor, who opposes the others by perceiving a more passive activity in the internship, in which "they [interns] only accompany and solve doubts in the classroom, do not actively participate in classes, that is, the experience of teaching the class and choose a topic is not proposed to them (D5)".

It is important to note that most supervisors perceive experiential learning in the teaching stage, as they encourage students to pursue learning in a continuous way through the transformation of experience (Kolb, 1984). For the students, even those who already had teaching experience, the internship gave meaning to their previous experiences, in view of the fact that they can observe the professional performance of their supervisors, as shown in the following excerpts:

> [...] For me, it was extremely important, because I was able to see a side of teaching that I did not even know existed, right? Both in the use of different, active methodologies and in the look at what, at how the teacher can actually conduct a class, in the sense that I had a very, really, idea of what I was dealing with, right? Very static. That broader look was missing. [...] It was a watershed really, I could see points that I could, that I should have already improved and that were things that were kind of simple, obvious, but that I alone could not arouse. The teaching internship provided me with this opportunity along with, in this case, my advisor (E 19).

> At first, I confess that, when I was told that I had to do two semesters of teaching internship I wanted to die. I said: 'it is not possible that I have been teaching for 5 years and I will have to take the teaching internship discipline"! But I confess it was really worth it. [...] My advisor also uses active methodologies, so I also had contact with things that I was not used to. Later, in the second teaching internship in the doctorate, in the research part, I also found it very interesting, because, mainly, from the advisory point of view, I learned a lot from my advisor, for example, monograph advice was a lesson for me. [...] So, I confess that teaching internships are important. And mainly in our area, we do not train teachers, which is not a teacher training course, it is a Bachelor program. So I think this is a time for anyone who wants to be a teacher, to have a guide (E 21).

Based on the interviewees' statements, the relevance of the role of the teaching internship for this training is observed. Although the students reported some resistance in taking the teaching internship due to their background experience with teaching, skills such as using a different methodology and organizing activities could be developed by taking that curricular component. This reflects the individual's ability to connect with previous experiences to promote new learning (Merriam & Bierema, 2013).

Another point highlighted in the interviews with the teachers concerns the function of the internship as a process of reflection on the practice and the relevance of the trainees' reflections during the teaching internship, especially with regard to the students' behavior during the classes, as one of the interviewees reported:

> They end up reflecting and thinking... they talked, during the actual observations, they look more, sometimes, at the students' behavior because they are there just for that, to be watching how the teacher is managing the class and how the students are behaving and they are thinking: "Oh, what if I did this, what do you think...". So I think this has happened too, it has happened to the students, they have reflected on... "Oh, this has worked. I see that, when you do an exercise like that, the students engage more and so". They have done these reflections, yes (D3).

The role of the supervisor during the internship is crucial for the reflections to become significant in the students' professional development process, corroborating Joaquim *et al.* (2011), which highlight the importance of reflexivity in promoting learning and generating knowledge in a meaningful learning experience. One teacher's discourse reveals the intention to provide moments of observation to the trainees before their actual performance in the classroom.

> [...] I schedule this class that they will teach further ahead forward, more towards the end of the semester, until they gain some confidence, have more security when applying the content because, sometimes, they are kind of insecure even, especially at the beginning (D3).

According to the students ' reports, the opportunity they had to accompany their tutors during the teaching internship contributed for them to analyze their postures in front of the classroom, as well as the way they interacted with the students and the way they explained the content. It is precisely in this environment of observation, imitation, and reproduction provided by the teaching internship that the student begins his construction as a teacher (Santos & Helal, 2015).

Nevertheless, the process of observing the supervisor's performance was not sufficient to overcome anxiety and nervousness at the time the students had to conduct the class, as they described.

> [...] but insecurity, not to stand at the front, to speak in public, that's not the problem. The problem was if what I was (sic) talking about was right. So, that's the main point that caught me, it was if what I was (sic) talking about made sense, if it was (sic) right, exemplify, because it's not just talking about the theory, right? [...], but be able to exemplify, contextualize, cross with things they are in doubt about, be able to answer what the students inquire on (E13).

> And until that day came, I was paying attention to the way she taught, the way she behaved, the way she talked to the students, and even then, insecurity also existed. I remember that, on the day I went to give the class, I was (sic) very insecure, but it was not so much because of the subject, because I think I had even prepared myself, because, when we know that we will be confronted, we prepare even better[...] (E14).

As noticed, even when the students felt insecure, given the responsibility of having to teach in front of the supervisor, they linked to what they had observed earlier, that is, they used the teacher's experience to guide them while conducting the class. This is understandable, because "the way to learn the profession, according to the perspective of imitation, will be from the observation, imitation, reproduction and, sometimes, reworking of existing models in practice consecrated as good" (Pimenta & Lima, 2004, p.35).

When asked about a possible conversation with their internship advisors about insecurity, or even the nervousness that accompanied them in this learning process concerning teaching practice, the students commented on how important contact with the supervisor was for them, even before the beginning of the internship. One supervisor's discourse supports this fact: "[...] of course there is nervousness there, right? At first, but then they said that they ended up relaxing and were able to also observe the students, how they were behaving [...]" (D3). On this aspect, Rocha-de-Oliveira and Deluca (2017) argue that the relationship of proximity that is established between teacher and student throughout the internship contributes to the student's performance during the activity.

The moment after the class the trainees taught is also seen as an important part of the reflection process, because it is at this moment that supervisor and trainee reflect on positive and negative points, also exchanging experiences and perceptions about the experience gained.

> [...] After their presentation, [...] I give *feedback*, presenting strengths, weaknesses, what I think that needs to improve, right? And, in many cases, I have mentees who are already teachers, they already act as teachers, but, even so, I do not fail to give *feedback*, to give suggestions, to show aspects that, perhaps, by experience, they have not learned (D4).

The above reveals the extent to which the teaching internship can contribute to graduate student education, in view of the potential of associating theoretical knowledge with teaching practice, as suggested by Joaquim *et al.* (2013). In addition, the importance of the teachers' *feedback* in the training process of graduate students is noticed, regarding their learning efforts during the internship, according to what Kolb and Kolb (2005) proposes. In this sense, the proximity between the supervising teacher and the student in the teaching internship is fundamental for the student to perform well in this educational stage, as it arouses critical reflections on the teaching-learning process (Rocha-de-Oliveira & Deluca, 2017).

4.2 Skills and competencies provided by teaching

In this category, the competencies the students gained in the teaching internship were analyzed, based on the ten competencies proposed by Zabalza (2003).

The skills that stood out in the trainees and supervisors' discourse diverged in some points, but converged by highlighting the planning of the teaching-learning process and the evaluation process as skills acquired and developed during the internship.

The planning of the teaching-learning process may have been one of the main skills addressed in the teaching internship, according to the report of the group of students without teaching experience, as well as that of some supervisors.

> [...] I think they develop the ability to plan, to organize the time within a classroom, the same skill that I have already mentioned, to distribute the content in the class time, and the ability to also to try to plan the evaluations (D3).

> I think the most positive gift I got from the teaching internship was dealing with time. [...] both in the organization of the class, planning, thinking about what you will do, thinking about how you will do, and in the class itself (E19).

Planning the teaching-learning process, as a competency contemplates: the legal determinations, the curricular structure the discipline is inserted in, the teacher's experience in relation to this, factors that characterize the students (quantity, background qualification, interests) and available resources (Zabalza, 2003).

Nevertheless, not all internship supervisors exploit the ability to plan the teaching-learning process, as follows: "No, they [students] do not participate in this [planning the teaching-learning process], no (D5)". This represents a failure in the teacher training process, given the importance of this competency, especially when entering the profession.

Another competency both supervisors and trainees highlighted was the development of assessment skills. Some students commented on their experiences with their advisors during the internship, mainly on the responsibility in the elaboration of test questions and the correction of evaluation activities.

> My advisor commented on the importance of the test and the care I would have to take to make the test, to be very coherent with what had actually been presented in the classroom. But, like, what she told me is that what she usually did was to try and bring it very close to what had actually been addressed in the room [...] (E16).

> At the time of the evaluations, I involve them in the sense that they have to help me in drafting questions [...] They will have to study the content to elaborate questions. So, they will, yes, propose questions for these assessments and I believe that they understand, thus, the importance of the assessments, right? (D2).

The statements described above illustrate one of the propositions of the experiential learning theory, as they highlight the fact that learning is, in fact, a process of re-learning. Thus, this learning can be facilitated by sharing with the students ideas on a particular topic (for example) for them to examine, test and add new ideas, actually improving them (Kolb & Kolb, 2005).

Regarding the competency related to the use of teaching technologies, the students in the two focus groups disagreed. Some students claimed that their teachers were more traditional and did not use these tools in the teaching process, while others had the opportunity to apply technologies during this process. In this sense, a student of the focus group with no experience in teaching reports "I have not had this, because my advisor is more traditional. Chalk, *datashow*, at most" (P11). This excerpt corroborates the discourse of a supervisor who said she did not use different teaching techniques and that, therefore, she did not usually encourage her trainees to use them.

> [...] I, because I do not use many technologies [teaching], I think that a little because of the disciplines that I have taught in recent times, they do not give much space for me to apply these new, these new techniques [...]. He does not learn, like, that many techniques, in my discipline [...] (D1).

On the other hand, excerpts from the focus group with students who already had teaching experience depict the use of teaching techniques different from the traditional ones, also highlighting the importance of the supervisor's in encouraging and showing the various existing technologies. According to Zabalza (2003), the ability to elaborate the methodology and organize the activities consists in choosing the teaching strategies, as well as formulate instructional activities and organize the spaces aimed at learning. In this sense, based on the participants ' statements, it is noted that this competence was greatly exploited during the internship.

> In the doctorate, for example, I had the opportunity to accompany my advisor, right? And she uses different learning techniques, right? So, like, I was able to follow, participate, develop things that I don't use much in my classes. (E17)

> The issue of using methodologies, because I really did not know this. We know, we see that there is something like this, but we do not know that it has a name, there is a way to apply it, an ideal scenario to apply it, so I think it helped me a lot. And I had the same feeling, I felt like "oh, I want to come back soon, because I want to try it here". (E19)

The students' statements reveal that, based on their experiences in the teaching internship, they were able to better know the teaching strategies, because their advisors/supervisors already use them. García and Conde (2003) argue that the theory of experiential learning can be associated with educational practice when considering that, for each learning style, different teaching methodologies can be applied.

In view of the reports presented here, during the teaching internship, the students had the opportunity to develop some skills suggested by Zabalza (2003) and which are required from teachers, such as the planning of the teaching-learning process, the management of technologies, communication; the evaluation, the elaboration of the methodology and the organization of activities. This conclusion corroborates Joaquim *et al.* (2013), as graduate students and teachers recognize the role of the teaching internship for the development of important skills for teaching practice, given the initial contact with the teaching environment this curricular component permits.

It is also important to highlight that the competencies the students and their internship advisors point out are in accordance with the skills proposed by the resolution of the PPGCC investigated in this research. Thus, the competencies proposed by Zabalza (2003) and identified in this study show that the graduate students perceive the goal of the PPGCC in offering the teaching internship. These findings entail relevant implications regarding the role of the program for the teacher training process.

4.3 Main challenges faced during the teaching internship

The third analytic category refers to the main challenges faced during the teaching internship. In this category, six subcategories emerged from the analysis of the interview transcripts and focus groups. The subcategories that stood out depict the challenges due to the diversity of methods the teachers adopt in conducting the teaching internship process and the supervisor's (lack of) preparation.

The first highlight shown in the students and supervisors' discourse refers to the students' heterogeneous experiences when taking the teaching internship. According to the participants, the supervisors conduct the internship differently, even if there is a resolution that guides the process.

> We do not have the definition of what would be appropriate or what is expected of the teaching internship. So, each teacher conducts it in one way. [...] But I think systematization should exist because, if we are thinking that the teaching internship exists to train teachers in graduate education, I clearly see that some are not trained, because of the way it is conducted [...]. It even turns into a joke: 'Really, do you follow the teacher in the classroom?! I don't believe you do that, you know? (E17).

> Well, based on our experience here in the program, I think there is still great heterogeneity about the conduct of the internship. I think there is no standardization, right? [...] we need to improve further in this sense (D4).

The participants' comments about how the teaching internship is conducted corroborate the position of Bastos, Tourinho, Yamamoto & Menandro (2011), as they show that the graduate programs do not seem to know how to offer pedagogical training to their students. This is because the supervised internship ends up presenting very different formats, not only between one program and another but also within the same program.

Thus, even if a resolution exists about the teaching internship in the program under analysis, it is not able to guarantee uniformity in the way it takes place. Perhaps this can be associated with the lack of pedagogical qualification of the teachers responsible for supervising the internship, which compromises the preparation of their mentees as future teachers, as the trainees mirror many of their actions based on the experience they acquire during the internship.

The lack of pedagogical qualifications can also be associated with the lack of preparation to serve as a supervisor. According to some supervisors of the internship, one of the challenges faced concerns the lack of preparation to conduct this process.

> Well, I think the first point is that we were not prepared for this, right? We weren't... we did not receive instructions on how to advise the trainee. So, for example, with the first students it was more difficult. Then, we learn from the experience, from the research we do, but I notice that there are many colleagues who sometimes have more difficulty than I to conduct this type of supervision (D4).

The teachers' statements can be understood from the perspective of Bastos *et al.* (2011) because, according to the authors, pedagogical training is not required from the university teacher, because the mastery of specific knowledge is considered sufficient. This fact ends up affecting graduate education, considering that the Masters and doctoral graduates trained in these courses can take on the teaching without having the necessary pedagogical skills to act in higher education (Bastos *et al.*, 2011). Thus, we should acknowledge that teaching practice requires knowledge and skills that can be acquired or developed based on a pedagogical training process capable of filling the gap left by the initial training or the training provided in the graduate programs (Junges & Behrens, 2015).

It is important to consider that teacher training is not limited simply to the fact that the graduate student has contact with the classroom by replacing his or her advisor. Similarly, this training cannot be guaranteed by offering one or more disciplines aimed at pedagogical training (Bastos *et al.*, 2011). According to the authors, this type of training requires more from the graduate programs, but they may not know how to offer it.

In summary, the challenges faced and alluded to, both by supervisors and trainees, relate to the heterogeneous experiences surrounding the internship, as well as the challenges of conducting this process of training future teachers, so as to allow the acquisition of skills and competences in such a short time. This process becomes even more difficult when considering that many of the internship supervisors have not received preparation for teaching and yet are responsible for conducting their students' learning based on their failure and success in their previous experiences.

In view of these challenges, further reflection and inquiry are due: **What measures could the PPGCCs adopt to ensure not only the systematization of the internship but, mainly, the student's performance in this curricular component?**

4.4 Synthesis of Results

Based on the analysis of the focus groups with the graduate students (without and with experience in teaching when performing the teacher training) and the interviews conducted with the teachers about the teacher training, we observe that the perceptions, although distinct, are very positive in relation to this curricular component. In that sense, Table 4 summarizes the main aspects observed in these groups

Table 4
Teacher Training

Categories	Group without teaching experience	Group with experience in teaching	Teachers
Function of teacher training	• Approximation with the teaching activity • Opportunity to experience the challenges involved in teaching • Contribution to didactical-pedagogical training	• Reflection and enhancement of the teaching practices • Learning as a constant process	• Opportunity for the student to experience the classroom practice • Approximate the student to the teaching process: class planning, elaboration of activities and assessments • Reflection on the teaching practice
Skills and competencies provided by teaching	• Knowledge linked to teaching and its challenges • Plan the teaching-learning process • Evaluate	• Technology management • Elaborate the method and organize the activities • Tutoring	• Plan the teaching-learning process • Evaluate • Ability to communicate with and interact with the students
Challenges faced throughout the training process	• Heterogeneous student experiences • Distinct training formats	• Heterogeneous student experiences • Distinct training formats	• Heterogeneous student experiences • Distinct training formats • Lack of pedagogical qualification of the teacher responsible for supervising the training • Short length

Source: elaborated by the authors.

Table 4 reveals the main contributions and challenges involved in teacher training. The perceptions of the groups presented earlier show the importance of the teaching internship for teacher training, whether in the initial or continuing stage. After all, one should acknowledge that learning occurs to a greater extent when people have the opportunity to act, making discoveries that benefit themselves (Behr &Temmen, 2012).

In this sense, it is possible to associate the teaching internship with the theory of experiential learning, considering that the appropriation of the individual experiences, based on action and continuous reflection, can be improved in the training environment (Kolb, 1984). It was verified that the teaching internship provides such experiences related to the pedagogical training of graduate students, mainly by providing them with a series of experiences that motivate them to act in favor of their own learning (Behr & Temmen, 2012). Thus, experimentation through the teaching internship permits the development of competencies necessary in the teaching process, combining theory and practice (Joaquim, Nascimento, Vilas Boas & Silva, 2011; Joaquim & Vilas Boas, 2011; Santos & Helal,2015).

5. Final Considerations

This study aimed to identify the skills developed in teacher training according to *stricto sensu* graduate students in accounting and their supervisors.

The research results showed the responsibility of the teachers supervising the teacher training with regard to the monitoring of the activities carried out in this teaching modality. The findings also indicate that the students' experiences in the training are mirrored in the teachers. In addition, the contribution of the teacher training to the development of competencies necessary for teaching is verified, as suggested by Zabalza (2003): ability to plan the teaching-learning process; improvements in communication, in the relationship with students, in the evaluation forms, among others.

In that sense, the internship served not only as a moment of improvement, but also of reflection about the learning practices themselves, and especially as a stimulus for the development of the competencies required in teaching. The trainees were able to truly experience the teaching-learning process, as they had the chance to associate theoretical knowledge with classroom practice (Joaquim *et al.*, 2013).

Overall, the results of the study revealed the need to develop devices that ensure the systematization of the teacher training, in order to guarantee that the experiences in this activity contribute effectively to the student's teacher training.

Important implications and contributions of the study findings were identified. It is remarkable that the concern with the teacher training should focus on how it is being conducted by the *stricto sensu graduate programs*. In that sense, the educational objectives concerning the training should be very clear, as well as the guidelines for its accomplishment. In addition, some mechanism needs to be in place to guarantee that the advisor/supervisor will properly monitor the student. Those teachers need didactic-pedagogical training to allow them to take on that responsibility, as well as clarity on their responsibilities as training supervisors.

Among the limitations of this research, we highlight the fact that the focus groups and interviews were conducted in a single PPGCC. Expanding the data collection through the collaboration of other graduate programs in accounting could offer further contributions and reflections on the theme investigated in this research.

Future studies could focus on investigating how the PPGCCs have monitored the teacher training and what actions have been developed to guarantee student performance when studying this curricular component.

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The relation between the property structure and the leveraged debt cost via debenture issues in Brazil

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Abstract

Objective: This research aimed to identify the relation between the percentage of direct participation in the property (control) and the leveraged debt cost via debenture issues in Brazil.

Method: The cost of debt (spread of interest rate of debenture issues) was regressed with the property structure (direct property concentration, direct control concentration and excessive control), using linear and quadratic regressions for the period from 2011 to 2018.

Results: The results found suggest that, among the analyzed property/control structure characteristics, only the concentration of direct control is relevant for the debenture holders when pricing the securities.

Contributions: The research contributes to the literature by evidencing that the relation between control concentration and spread is quadratic. Hence, to a certain extent, the increase in the control concentration is reflected in an increased cost of debt; nevertheless, when this concentration becomes very high, the creditors interpret it as something beneficial, reducing the cost of debt. These results suggest that the positive and negative effects deriving from the control concentration are present in the debt leverage; nevertheless, the benefits only tend to appear when the control concentration becomes high.

Key Words: Cost of debt. Debenture Issue Costs. Agency Costs. Property Structure. Stockholder Concentration.

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1. Introduction

Third-party capital represents a significant source of funds allocated to investments in companies, even to publicly-traded companies. Latin American companies, for example, have debt levels similar to those of companies in the United States of America, despite experiencing relatively lower tax benefits, higher bankruptcy costs and restricted access to several sources of financing, mainly long-term (Céspedes, González, & Molina, 2010).

The finance literature recognizes that there are potential conflicts whenever owners and creditors diverge in their respective utility functions, risk preferences, and information (Jensen, 1986; Jensen & Meckling, 1976; Myers, 1977). Nevertheless, the main corporate governance mechanisms are, a priori, designed to promote the alignment of interests between owners and managers and even between owners (Shleifer & Vishny, 1997). There are reasons to believe that certain corporate governance mechanisms may be assessed unfavorably by debt bondholders, particularly the configuration of ownership (Ashbaugh-Skaife, Collins, & LaFond, 2006; Jiraporn, Chintrakarn, Kim, & Liu, 2013).

Research efforts have been made to consider the effect of the ownership structure, as a corporate governance mechanism, on the cost of debt. Efforts are predominantly focused on analyzing companies from the United States of America, Europe, and Asia, as found in the literature review. In general, the companies listed on the Brazilian stock exchange present particular ownership structure characteristics in relation to the diffuse ownership companies of the conventional corporate control model in the United States of America and the United Kingdom, with high ownership (control) concentration and low contestability of the dominant stockholder's power (Crisóstomo, Brandão, & López-Iturriaga, 2020). In addition, the exercise of corporate control is consistently preserved by the issuing of double class shares and pyramidal structures (Aldrighi, 2014; Aldrighi & Mazzer Neto, 2007; Aldrighi & Postali, 2011; Bortolon, 2013). Consequently, there is an unequal distribution of the control power that can lead the dominant owner to exert a strong influence on the definition of the investment policy, among other consequences, in order to meet his personal interests at the expense of the other shareholders' interests (Bebchuk, Kraakman, & Triantis, 2000; Claessens, Djankov, Fan, & Lang, 2002; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000).

To address the effect of the ownership structure on the cost of debt in the Brazilian capital market, the objective outlined seeks to identify the relationship between the percentage of direct participation in the property (control) and the cost of borrowing via the issuing of debentures in Brazil. To characterize the punctual effect of a specific corporate governance mechanism on the cost of debt, debentures are considered as a specific type of debt collection, with the potential to generate conflicts of interest between owners and creditors. The research is relevant in this context, as the issue of debentures can be considered one of the main types of long-term financing available to Brazilian companies, even when compared to equity issues. According to data from the Capital Markets Bulletin 02/2020, of the Brazilian Association of Financial and Capital Market Entities (Anbima), the issuing of debentures between 2014 and 2019 totaled approximately R $ 626 billion, while fundraising via share issues (Initial Public Offerings and follow-ons) totaled approximately R$ 185 billion (ANBIMA, 2020).

In contrast with previous research on the cost of debt in Brazil (e.g. Fonseca & Silvera, 2016; Konraht, Camargo, & Vicente, 2016; Barros, Silva, & Voese, 2015), the interest rate spread on the debentures does not present the potential problems present in the debt cost proxy when determined by the ratio between financial expenses and interest-bearing liabilities. Financial expenses comprise interests and other financial charges, such as monetary and exchange variations borne by companies, not only in attracting loans and financing but also those relating to payment terms signed with suppliers in general and discounts granted, for example. In addition, the interest-bearing liability can be influenced by the volume of debt that companies capture or amortize in periods close to the reporting period, which includes noise in the measurement of the cost of debt.

The results obtained suggest that, among the characteristics of the direct property structure considered in the analysis (direct property concentration, direct control concentration, and excessive control), only the percentage of direct control concentration (voting rights) showed to be relevant to creditors when the debentures are priced. The existence of a quadratic relationship between the concentration of control and the spread of the debt interest rate via the issue of debentures suggests that the concentration of control increases the cost of debt and, as this concentration of control becomes excessively high, the cost of debt tends to decrease. This reduction in the spread implies that creditors may be considering the concentration of control as a factor that potentially reduces the risk of an exchange of control occurring over the term of the debt contract.

The effect of the ownership structure on the company's value, from the perspective of creditors, is a controversial point in the corporate governance literature as, from the perspective of creditors, the greater the concentration of control, the lower the required return. It is therefore conjectured that the concentration of control would be associated with a lower likelihood of changing the company's management and its financial policies during the term of the debt contract. In other words, for creditors, the concentration of control would represent the maintenance of the levels of risk and compliance with contractual covenants after the credit is granted.

The analysis of the results presented is understood as an indication of the creditors' behavior in the pricing of debentures in Brazil and needs to be evaluated with caution as, to identify the ownership structure, we used only the direct participation percentages of the owner(s) appointed as controller(s) when the company disclosed the ownership structure. Since 2005, the issue of double-class shares in the Brazilian capital market has decreased, while the indirect control structures have increased (Andrade, Bressan, & Iquiapaza, 2014; Bortolon & Leal, 2014). Despite the relevance of indirect control structures in the Brazilian capital market, obtaining the percentage of ownership of the ultimate shareholder is not one of the easiest tasks, nor does it even indicate whether a family owns the property. Part of the challenge concerns the presence of companies not listed on the stock exchange in pyramidal structures and the time required for the collection. In addition, research has shown that the percentage of direct participation of the dominant owner is close to the percentage of indirect participation of the last shareholder, subject to the specificities of the sample and the period covered (Aldrighi, 2014; Bortolon, 2013, Grillo, Reina, Bortolon, & Sarlo Neto, 2017). These and other limitations in the execution of this study indicate that there are developments to be explored in future research that can better define the outlines of the reported effect.

2. Literature review and hypothesis development

The use of third party capital favors the sharing of investment risk with creditors. At this point, overinvestment, underinvestment, and depletion of property can explain certain debt agency costs. The adoption of non-profitable (asset replacement) or excessively risky (risk-shifting) investment projects increases the variance of the firm's future cash flows and disproportionately transfers the negative results that may be obtained (Jensen, 1986; Jensen & Meckling, 1976). Likewise, investment projects with positive net present value can be rejected if residual profits are preferably transferred to creditors, characterizing the problem of underinvestment (Myers, 1977), even if the payment of dividends is preferable. In all these circumstances, the risk of not receiving the contractual claims set by creditors would be changing, especially if the indebtedness becomes relatively high, a situation in which the efforts of insiders to control the risk of financial constraint, bankruptcy and liquidation will supposedly be quite limited (Jensen, 1986, Aslan & Kumar, 2012).

Creditors, to the extent that they foresee the existence of these agency costs, certainly demand higher interest rates and include in the debt contracts restrictive clauses to demand proper guarantees and impose mechanisms to monitor the use of the assigned resources. Under this argument, it is conceivable that there is no significant relationship between the ownership structure (control) and the cost of debt. It is not always possible to deal with all future contingencies though, nor even to find inexpensive solutions for monitoring investments in negative net present value projects (Steijvers & Vooerdeckers, 2009). Therefore, the cost of debt tends to increase as conflicts of interest between insiders and creditors increase or cannot be remedied (Aslan & Kumar, 2012).

Sanchez-Ballesta and García-Meca (2011) evaluated the influence of ownership concentration and identity of owners on the cost of debt in a sample of Spanish companies between 1999-2002. The reported results indicate a significant effect restricted to the property held by the chairman, the government, and the banks. In general, the identity of the owner seems to have contributed to the reduction in the cost of debt, while the concentration of ownership has not shown to be statistically relevant. Lugo (2019) presents empirical evidence on the cost of bank loan debt between 1996 and 2010 from companies in several countries in Europe, Asia, and also the United States of America. The main result presented appoints that the shareholding interest of insiders is inversely related to the cost of debt, taking the form of an inverted U.

In the Brazilian context, little is known about the exclusive relationship between ownership structure and debt cost, partially because the research results are difficult to reconcile. Barros et al. (2015) observed that corporate governance attributes that make up a governance index had a negative influence on the cost of debt between 2008 and 2010, while the adoption of distinguished listing levels on the stock exchange was not statistically significant. Fonseca and Silveira (2016) found that the cost of debt tends to be lower due to the percentage of preferred shares issued by companies and due to the adoption of distinguished listing levels on the stock exchange in the period from 2010 to 2014. But two other proxies of the direct ownership structure (percentage of participation of the largest shareholder and the difference between control and ownership of the largest shareholder) did not have a significant effect. Silva, Santos, and Almeida (2012) found that, between 2005 and 2010, the concentration of control was positively associated with the credit ratings for debentures. Konraht et al. (2016) presented evidence that excessive control has a positive influence on the cost of debt between the years 2011 and 2014.

In Western Europe and East Asia, the cost of debt is significantly higher when there is a divergence between ownership and control (Aslan & Kumar, 2012, Lin, Ma, Malatesta, & Xuan, 2011) and even for the cost of capital (Guedhami & Mishra, 2009). Also, in companies in Europe and Asia, as presented by Boubakri and Ghouma (2010), the identity of the owner also influences, in such a way that excessive family control has a positive effect on debt bond spreads and a negative effect on the ratings of these securities. The ability of insiders to effectively control corporate resources and to engage in activities that permit gaining private control benefits is positively related to the ownership level they hold (Shleifer & Vishny, 1997). Nevertheless, the insiders' entrenchment may happen due to the difference between property and control rights (excessive control). In many Brazilian publicly-traded companies, this situation is presumível because the practice of corporate control has been consistently preserved through the issue of double-class stocks and pyramidal structures (Aldrighi & Mazzer Neto, 2007; Aldrighi & Postali, 2011; Bortolon, 2013). Thus, the following hypothesis is presented:

H1: The difference between control and property rights (excessive control) increases the cost of the debt.

From the perspective of debt holders, the effect of ownership structure on the cost of debt may be different from that of insider and outsider owners. Creditors may care less about insider entrenchment, as long as the company's value is kept above the default limit. In addition, owners with large non-diversified holdings may have incentives to allocate resources in order to preserve them, that is, to avoid dilution of capital and preserve the exercise of corporate control, the likelihood of using third party capital increases. On the other hand, this relationship of dependence will cause them to become more concerned with the reputation in the market and, therefore, with the need to maintain financial policies throughout the term of the debt contracts. This somewhat decreases the moral risk borne by creditors after contracting the debt (Ashbaugh-Skaife et al., 2006; Jiraporn et al., 2013).

Reputation also figures among the arguments presented by Anderson, Mansi, and Reeb (2003). They identified that, in the United States of America, the concentration of ownership in the hands of the founding family is negatively associated with the cost of debt and explains that the cost of debt would be lower in these circumstances because large shareholders, including families, tend to be undiversified. As the founding family is more exposed to idiosyncratic risk, it tends to be more concerned with its reputation in the market and, in order to achieve long-term expectations, tends to avoid excessively risky projects.

Jiraporn et al. (2013) evaluated the relationship between corporate governance and the cost of debt for a sample of companies in the United States of America. In this case, corporate governance was represented by the ISS (The Institutional Shareholder Services) index with categories of governance standards and with emphasis on the board of directors, audit, by-laws, executive and director compensation, property, among others. The credit ratings and yield spread were used as a measure of the cost of debt. The result obtained showed that strong corporate governance significantly reduces credit ratings and increases yield spread. One possible explanation for this is how aligned the interests of management and owners are. The greater this alignment (strong corporate governance), the greater the possibility of underinvestment, while the high concentration of control in the hands of managers (weak corporate governance) would reduce the possibility of underinvestment.

Klock, Mansi, and Maxwell (2005) evaluated the effect of a governance index that contains several anti-takeover and shareholder protection devices on the cost of debt financing for a sample of companies in the United States of America, covering the period 1990-2000. Evidence indicates that stricter anti-takeover devices reduce the cost of debt financing. This result suggests that, in companies where it is more difficult to remove management, the probability of being evaluated favorably in the debt market would be increasing. This finding elucidates that, although the more rigid anti-takeover devices disadvantage the owners, as they impose greater difficulty to act against the management of the company, creditors tend to conceive of this fact as a positive aspect in the dimensioning of the expected return and risk for the provision of funds.

Consistent with the conjecture that creditors assess ownership structure in a very particular way, Byun, Choi, Hwang, and Kim (2013) found that companies affiliated with large Korean business groups had a substantially lower cost of debt between 2001 and 2007 than independent companies. They interpreted that creditors are willing to grant credit with a lower interest rate and other conditions more favorable to companies affiliated with an economic group because they would be realizing that additional protection is possible. Otherwise, business groups would serve as a credible commitment to rescue member firms with financial problems (co-insurance effect). Considering the above, the following hypothesis is formulated:

H2: The property (control) concentration reduces the cost of the debt.

3. Methodological Procedures

The sample consists of debenture issues registered in Brazil, between 2011 and 2018, carried out by publicly traded non-financial companies, excluding incentive debenture issues and those that were canceled soon after the issue announcement. The beginning of the time frame in 2011 results from the availability of data, as the data related to the control and ownership structures were collected from the reference Form of the year prior to the debenture issue, and the beginning of the disclosure of this report occurred in 2010. The end of the time frame in 2018 was due to being the closest base date for the collection and tabulation of property structure data in the data collection period of the research. The exclusion of the incentive debentures was due to the fact that these securities are exempt from income tax on the remuneration earned by the debenture holders. As a result, the tax benefit contained in the incentive debentures affects the real interest perceived by the creditors. Consequently, the spread of the debentures is differentiated for the incentive debentures. Thus, 730 issues of debentures were identified in the National Debentures System, 84 (11.9%) of which are open to the general public (CVM Normative Instruction No. 400), while 643 (88.1%) were issued in the modality with restricted efforts (CVM Normative Instruction 476). The modality open to the general public is the classic debenture issue format, in which the company issues securities that can be acquired by any investor; the issue modality with restricted efforts is offered to a limited group of professional investors, totaling a maximum of 75 professional investors who receive the offer, only 50 of whom can subscribe or purchase these securities (Comissão de Valores Mobiliários, 2009). These 730 identified debentures added up to a total of 980 series of debt securities, as each debenture can contain more than one series.

The series of debentures issued and maintained in the sample have several criteria for calculating remuneration, including a specific reference index and spread. Table 1 shows the remuneration criteria for the series of debentures analyzed, as well as the indices used as a reference.

Table 1

Reference indices used in the debenture series

Index	Debenture series	Proportion	Final sample analyzed: series with all financial data available for collection
DI + spread %	542	55,3%	361
% on DI	311	31,7%	-
IPCA + spread %	108	11,0%	-
Others (post)	5	0,5%	-
No index	4	0,4%	-
TJLP	4	0,4%	-
Pre-fixed rate	3	0,3%	-
Dollar	1	0,1%	-
IGP-M	1	0,1%	-
TR	1	0,1%	-
Total	**980**	**100%**	**361**

Legend: DI: Interbank deposits; IGP-M: General Market Price Index; IPCA: National Extended Consumer Price Index; TR: Reference Rate; TJLP: Long-Term Interest Rate.
Obs.: the 980 series are contained in 730 debenture issues. The survey date of these data was June 10th 2019. The debenture series without available financial data in the Economatica® database or on the website of the Brazilian Securities Commission to calculate the research variables were excluded from the sample. That explains the difference between the 542 initially identified series and the 361 with all data available for data analysis.

Source: elaborated by the authors.

As each form of remuneration has a specific spread, the spread of series with different indices is not comparable, nor can the 980 series of debentures be analyzed globally in a single regression model. As a result, the criterion was to analyze the series of debentures that adopt the remuneration in the form of the interbank deposit rate (DI), plus a fixed additional spread rate (DI + spread%). This criterion was adopted because this form of remuneration was the most used among the 980 series, which guarantees a greater amount of data for analysis. Also, these series are the most representative of the debentures issued in Brazil according to Konraht and Soares (2020). In addition to these aspects, Konraht and Soares (2020) found that debentures offering remuneration in the form of "IPCA + spread%" and "spread% over DI" tend to have debt characteristics or firm characteristics different from other issue modalities, which indicates that these modalities are chosen by companies that carry out issues of greater maturity, such as those that remunerate in the form "IPCA + spread%", or are issued by companies with greater growth options and that offer a larger number of restrictive clauses to protect creditors, as is the case of companies that pay "spread% over DI". Thus, the selection of other series could lead to a sampling bias if securities with specific debt and company risk characteristics were selected, when compared to series in general, such as, for example, selecting debt securities with longer maturities or issued by companies with greater growth opportunities.

Approximately 55% of the series of debentures collected offer remuneration at the interbank deposit rate plus a fixed spread rate (DI + spread%). Thus, the cost of debt, a variable dependent on the study, will be measured at the fixed spread rate in relation to the DI rate. The fixed spread rate used will be that already adjusted to the result of the bookbuilding process, a procedure similar to that adopted by Sheng and Saito (2005) and Konraht and Soares (2020). The 361 series of debentures that made up the final sample were issued by 131 companies. These companies operate in several economic sectors, mainly electricity (27.7% of the series), car rental (11.9% of the series), road transportation (9.7% of the series), residential construction (8.9% of the series) and water and sanitation systems (5.5% of the series). These sectors account for approximately 64% of the debt securities in the sample.

Given that each debenture issue is carried out on a specific date over the years, it was decided not to use panel data, as the data structure is not sequential, and there were cases of companies with only one debenture issue during the sample period, while others issued debentures more than once in the period; thus, the research hypotheses were tested using pooled Ordinary Least Squares (OLS). In Equation 1, the regression model specified for the relationship tested in this research is presented.

$$Spread_i = \alpha_i + \beta_1 PropertyStructure_i + \beta_2 Size_i + \beta_3 Indebtedness_i + \beta_4 Profitability_i + \beta_5 SecuredGuarantee_i + \beta_6 Selic_t + \sum_{k=2011}^{2018} \delta_k Year_k + \varepsilon_i \quad (1)$$

In Table 2, all variables in the model are presented.

Table 2
Description of research variables

Variável	Sinal	Operacionalização	Referência
Debt spread		Natural logarithm of additional interest rate in relation to DI rate. This is the proxy for the cost of debt, the dependent variable in the model	Sheng and Saito (2005)
Direct property structure a) direct control concentration	–	Percentage of ordinary stocks (ON) held by controlling stockholder(s)	Caixe and Krauter (2013); Claessens et al. (2002); Silveira, Barros and Famá (2008)
Direct property structure b) Direct property concentration	–	Index between sum of ordinary (ON) and preferential stocks (PN) held by controlling stockholder(s) and total company stocks	Authors
Direct property structure c) excessive control	+	Index between direct control concentration and direct property concentration minus one unit (control/ property – 1)	Cronqvist and Nilsson (2003)
Company size	–	Natural logarithm of total assets	Boubakri and Ghouna (2010); Caixe and Krauter (2013)
Indebtedness	+	Index between current liabilities and total assets	Boubakri and Ghouna (2010); Byun et al. (2013); Li et al. (2011); Lugo (2019)
Profitability	–	Index between accumulated EBITDA of four terms previous to the issuing of the debentures and total assets	Byun et al. (2013); Okimura, Silveira and Rocha (2007); Silveira et al. (2008)
Secured guarantee	+/–	Dummy variable equal to 1 if the debenture has a secured guarantee and 0 if not	Byun et al. (2013)
Year of issue	+/–	Annual dummies	Authors
Selic	+	Annual Selic rate of issuing period of the debenture	Authors

Source: elaborated by the authors.

As shown in Table 2, three aspects of the ownership structure are considered: (a) direct control concentration; (b) direct property concentration; and (c) excessive control. The owner or group of owners identified as the owner(s) of the company on the reference form was considered as the company's controller. When there was an indication of more than one controller, the sum of the interests of the indicated group was performed. The three aspects of the ownership structure were calculated considering the direct holdings and this is a limitation of the research, given that it does not take into account the indirect holdings that occur through pyramidal control structures and actions without voting rights. Comparisons between these two forms of measurement indicate that there is a relative similarity in the values calculated by the two methods though, as presented in Grillo et al. (2017). In addition, tests carried out by Silva (2004) indicate that the relationship between the characteristics of ownership/control concentration, measured directly and indirectly, and the value of companies is substantially the same, although the measuring of indirect holdings has greater explanatory power.

In addition to these property structure variables, other variables that can also affect the cost of debt were included in the regression model. These variables represent characteristics of the company, of the debenture and macroeconomic aspects, and are as follows: (a) size of the firm; (b) indebtedness; (c) profitability; (d) offering a secured guarantee on the debenture; (e) effective Selic rate in the term during which the debt was issued; and, (f) annual dummies. The size of the firm is a characteristic that can potentially represent part of the creditors' risk, and larger companies are expected to have lower debt costs. In larger companies, the risk of default would be reduced due to the possibility of selling the assets, in the face of financial difficulties, in addition to the reputation effect. Indebtedness is also a variable that represents a risk, as more indebted companies tend to have a higher risk of going into insolvency and delaying payments to creditors; thus, it is expected that, in more indebted companies, the cost of debt will be higher. Profitability is a measure of the company's economic strength; thus, it is expected that the greater the company's profitability, the lower the cost of borrowing will tend to be, given that the likelihood of facing economic and financial difficulties will be lower in more profitable companies. The secured guarantee is an instrument to protect creditors; thus, it is expected that debentures that offer secured guarantees to creditors will have a lower cost of debt, considering that creditors will have greater security of recovering the capital provided. On the other hand, evidence indicates that the secured guarantee can be used as a complementary mechanism to the interest rate to protect creditors (Bharath, Sunder, & Sunder, 2008). In this perspective, it is expected that, in riskier companies, the cost of debt will be higher and, also, that there is a greater probability of containing a secured guarantee. Due to this theoretical impasse, the expectation for the expected signal of the variable secured guarantee is left open. The Selic rate is the basic interest rate in Brazil; thus, it is expected that, as this rate increases, there will also be an increase in interest rates on corporate debt securities (debentures). Finally, the annual dummies are inserted in the models to control for macroeconomic effects that occurred in Brazil during the analysis period, and which may have affected the interest rates charged to companies.

4. Results

Table 3 shows the descriptive statistics for the variables used in the empirical investigation. Panel A of this table contains the temporal distribution of the sample's debt securities; Panel B contains the statistics of the 361 observations that made up the research sample; Panel C shows the sample statistics separated by the debenture issue mode. From the data in Panel B, it appears that, on average, the spread of the additional debt at the DI rate is 1.89% p.a. This variable is heterogeneous, with a minimum of 0.24% and a maximum of 10.2%. The size of the companies is also quite heterogeneous and, on average, corresponds to R $ 8.9 billion. Total assets are mainly financed by third-party capital, with an average of 63%, and this is relatively homogeneous among the companies in the sample.

Table 3
Descriptive statistics

Panel A: Temporal distribution of debenture series

Year	2011	2012	2013	2014	2015	2016	2017	2018
Number of series	42	51	52	30	38	17	58	73
Frequency	11.6%	14.1%	14.4%	8.3%	10.5%	4.7%	16.1%	20.2%

Panel B: Descriptive statistics of dataset

Variable	N	MN	SD	VC	Min	Q1	Md	Q3	Max
Spread (%)	361	1.89	1.1	0.60	0.24	1.1	1.6	2.4	10.2
Secured guarantee (%)	361	15.8	–	–	0	0	0	0	1
Company size (billion R$)	361	8.9	13.3	1.5	0.1	2.2	4.5	9.9	107
Indebtedness (%)	361	63.0	14.1	22.6	21.3	53.7	63.0	71.6	95.2
Profitability (%)	361	2.4	4.1	1.7	-19.0	0.5	1.8	3.9	25.0
Direct control (%)	361	69.3	27.8	0.4	8.1	50.3	68.6	99.9	100
Direct property (%)	361	64.7	29.7	0.5	8.2	39.9	64.9	99.9	100
Excessive control (%)	361	4.6	11.7	2.5	-5.1	0.0	0.0	0.0	48.1
Selic (%)	361	9.6	2.5	25.8	5.8	7.2	9.9	11.2	14.8

Panel C: Observations segregated by debenture issuing modality

	Open to the general public						Restricted efforts					
Variable	N	MN	SD	1Q	MD	3Q	N	MN	SD	1Q	MD	3Q
Spread (%)	34	1.76	0.8	1.1	1.7	2.2	327	1.91	1.2	1.1	1.6	2.5
Secured guarantee (%)	34	5.9	23.9	–	–	–	327	16.8	37.5	–	–	–
Company size (billion R$)	34	10.9	10.5	3.4	7.0	15.3	327	8.6	13.5	2.1	4.2	9.8
Indebtedness (%)	34	67.1	11.8	57.1	64.9	79.9	327	61.8	14.3	52.9	62.9	71.6
Profitability (%)	34	3.1	3.7	0.9	2.1	4.7	327	2.3	4.1	0.5	1.7	3.8
Direct control (%)	34	70.2	31.0	36.4	79.5	100	327	69.0	27.6	50.3	65.4	99.8
Direct property (%)	34	64.0	33.3	31.0	71.3	100	327	64.5	29.4	40.9	64.0	99.7
Excessive control (%)	34	6.1	12.8	–	–	6.8	327	4.5	11.6	–	–	–

Legend: N: number of observations; MN: mean; SD: standard deviations; VC: variation coefficient; Min: minimum; Q1: first quartile; Md: median; Q3: third quartile; Max: maximum.
Obs.: the total number of 361 debenture series in Panel B was issued by 131 companies. In Panel C, the 34 series in the open to the general public modality were issued by 28 companies; in the restricted efforts modality, the 327 series were issued by 127 companies. Twenty-four companies issued series in both debenture modalities.

Source: research data.

The sample contains companies with dispersed ownership and control, extremely concentrated companies, as well as companies that maintain divergence between voting rights and cash flow by issuing two classes of shares. Regarding the ownership structure, the average ownership of voting shares is 69.3% (min. 8.1% and max. 99.9%), against average ownership of 64.7% (min. 8.2% and max. 99.9%) held by the controlling shareholders, percentages similar to the median. The difference between control and ownership (excessive control) is, on average, 4.6%, but quite heterogeneous among the companies. Furthermore, when analyzing the concentration of control based on the values of the quartiles, it appears that defined control companies (approximately 75% of the sample) predominate in the sample, that is, they have one controlling shareholder, which has more than 50 % of the shares with voting rights. The proportion of voting rights is higher, for example, than that described in Crisóstomo et al. (2020). On average, it corresponds to 49% for the largest shareholder, 67% for the three largest shareholders, and 70% for the five largest shareholders in a sample of 85 companies with the highest market capitalization in the period from 2010 to 2013. The property structure averages are difficult to reconcile because they are subject to the extreme values of the sample, and even to certain specificities of the period included in the analysis (Andrade et al., 2014; Bortolon & Leal, 2014). In this specific case, despite representing the direct property, they do not refer strictly to the largest shareholder, but to the shareholders appointed as controlling shareholders, as explained in section 3.

According to the data in Panel C, there is a predominance of debentures issued in the form of restricted efforts, which account for 90.6% of the sample data. This predominance can be explained by the greater simplicity of requirements required in this modality, which is reflected in the lower cost of the issuing process. The most significant average differences in the descriptive statistics of these two modalities are that issues with restricted efforts make greater use of secured guarantee as a measure of protection for creditors and tend to come from smaller and less indebted companies. Regarding the cost of debt, the concentration of control, ownership, and excessive control are relatively similar, although there is heterogeneity in the variances of these variables between the two modalities.

The results of the regressions that were aimed at identifying the effect of the ownership structure on the cost of funding through the issue of debentures in Brazil are shown in Table 4. The three models incorporate the characteristics of the ownership structure and demonstrated general validity at a 99% confidence level. In addition, the assumptions of the OLS estimation method were met, indicating that the models were duly specified.

Among the property structure characteristics analyzed, only the concentration of direct control (Model 1) showed statistical significance (5%) and seems to be sufficiently relevant for creditors to influence the cost of debt.

Table 4

Results of OLS estimations

Model:

$$Spread_i = \alpha_i + \beta_1 Property\ structure_i + \beta_2 Size_i + \beta_3 Indebtedness_i + \beta_4 Profitability_i + \beta_5 Secured\ guarantee_i + \beta_6 Selic_t + \sum_{k=2011}^{2018} \delta_k Year_k + \varepsilon_i$$

Characteristic of property structure analyzed	Model 1 Direct control concentration		Model 2 Direct property concentration		Model 3 Difference between control and property rights (exessive control)	
Variables	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Direct control concentration	0.011 (0.005)	0.021				
Direct control concentration^2	-0.001 (0.003)	0.020				
Direct property concentration			-0.0002 (0.001)	0.823		
Excessive control					0.07 (0.06)	0.24
Size	-0.15 (0.023)	0.001	-0.15 (0.02)	0.001	-0.15 (0.023)	0.001
Indebtedness	0.66 (0.18)	0.001	0.67 (0.18)	0.001	0.64 (0.18)	0.001
Secured guarantee	0.30 (0.073)	0.001	0.32 (0.073)	0.001	0.32 (0.07)	0.001
Selic	2.84 (2.72)	0.297	3.48 (2.72)	0.202	3.18 (2.72)	0.244
Profitability	-2.75 (0.66)	0.001	-2.84 (0.66)	0.001	-2.80 (0.65)	0.001
Constant	1.96 (0.48)	0.001	2.07 (0.49)	0.001	2.13 (0.47)	0.001
Fixed effect of the year	Yes		Yes		Yes	
Fixed effect of the sector	No		No		No	
F test (F)	15.0	0.00	15.6	0.000	15.7	0.00
Asymmetry and kurtosis test for normality of residues	3.66	0.16	5.33	0.07	5.5	0.07
Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (χ^2)	0.6	0.44	0.17	0.68	0.12	0.73
R^2	0.38		0.37		0.37	
Adjusted R^2	0.35		0.34		035	
Observations	361		361		361	
Companies	131		131		131	

Obs.: the values between parentheses indicate the standard error of the estimated coefficients. The asymmetry and kurtosis test and the Breusch-Pagan/Cook-Weisberg test appointed, respectively, absence of normality problems of the residues and heteroscedasticity in the model at a 95% confidence level. The variance inflation factors appointed absence of multicollinearity, as the maximum in the three models was lower than 10. As the models presented no problems to comply with the linear regression premises, we chose to presente the results with non-robust errors; nevertheless, when the same regressions are estimated with robust errors, the results remained stable. In the calculation of significance, two-tailed probability was considered.

Source: elaborated by the authors.

The results indicate that the concentration of control has a quadratic relationship with the cost of debt, that is; to some extent, creditors perceive the increase in the concentration of control as something negative, causing them to demand a higher remuneration in the supply of capital. As the concentration of control becomes very high, however, creditors start to see this as something beneficial, which is reflected in a lower spread charged in the supply of capital.

One of the possible factors that explain the reduction in the cost of debt as the concentration of control increases is the fact that this reduces the likelihood of a change in the company's control and its consequences for creditors. Changes in shareholding control tend to imply changes in companies' investment, financing, and dividend policies. Thus, when companies do not have a defined controller, other shareholders may take control of the company (takeover) and creditors may make undesirable changes along the lines of the discussion presented by Ashbaugh-Skaife et al. (2006) and Klock et al. (2005). Consequently, if undesirable changes by creditors occur, they might have to subject themselves to taking disproportionate risks ex post to those considered when contracting the debt. This reinforces the finding that the change of control is a sensitive issue for debt creditors in Brazil, in line with the findings by Konraht (2017), in that creditors for debentures in Brazil include, among the various covenants of the debt deed, provisions that prohibit changes in the company's shareholding control during the term of the debt, without such change being approved by the debenture holders' meeting. It is worth mentioning that, as noted in Table 2, the companies in the sample tend to resort, predominantly, to third-party capital. To maintain access to this source of financing, controlling shareholders may be more concerned with reputation and, consequently, with compliance with contractual clauses, similar to what was exposed in the previous literature, such as Ashbaugh-Skaife et al. (2006), Anderson et al. (2003) and Byun et al. (2013).

The concentration of ownership (Model 2) is not statistically significant to the extent of influencing variations in the debt spread. The alignment effect may not be an aspect that creditors consider relevant when pricing debt securities, at least in the Brazilian context, as the majority shareholders tend to get involved in the company's management. The argument that the difference between control and property rights increases the cost of debt (Model 3) was not statistically significant either. In the sample analyzed, the median of ownership concentration and control concentration variables are not significantly different, although the variation coefficient shows that companies are reasonably heterogeneous. This apparently contradicts the results reported by Konraht et al. (2016) for the Brazilian context. These authors use the ratio between financial expenses and the interest-bearing liability as a variable for the cost of debt though. The results presented in Table 3 refer to the cost of debt as the cost of issuing debentures. The specificities of debenture contracts and companies' use of these contracts can interfere with incentives, both for shareholders and creditors.

Finally, additional tests were carried out, re-estimating the same regressions of models 1, 2, and 3, with the segmentation of the sample by debenture issue modality: open to the general public and restricted efforts. In addition to this test, the replacement of the difference between control and ownership, calculated based on Cronqvist and Nilsson (2003), by other measures of the difference between voting rights and ownership was tested: (a) difference (subtraction) between the percentage of control and the percentage of ownership; and, (b) binary variable identifying the cases in which the percentage of control exceeds the percentage of ownership. The results found in these tests were consistent with those presented in Table 4, without changing the findings of the analysis.

5. Final considerations

This article presents evidence about the relationship between the ownership structure and the cost of debt, specifically in relation to debt leverage in Brazil. Two hypotheses were formulated based on theoretical predictions about the magnitude of the agency costs between shareholders and creditors. The first hypothesis predicts that excessive control would increase the cost of debt, assuming that debt costs increase as conflicts of interest between owners and creditors also increase. The results presented do not confirm that this occurs for the analyzed sample though. The creditors may have been able, for example, to incorporate the risk of variance of future cash flows into restrictive clauses and guarantees required in the issue of debentures, to make interest rates more appropriate. Thus, alignment between owners and managers and between owners may not be the creditors' core concern.

The second hypothesis predicted that the concentration of the direct property right (control) would reduce the cost of the debt. For the direct control concentration, the results were positive and significant; still, the quadratic relation shows that, as the concentration of control increases, this relation becomes negative. Therefore, it is interpreted that, to some extent, creditors perceive the increase in the concentration of control as something negative, causing them to demand a higher remuneration in the supply of capital; but as the concentration of control becomes quite high, creditors see this as beneficial, which is reflected in a lower spread charged on the provision of capital via the issue of debentures. As the results were not significant for the concentration of direct property, it is interpreted that, given the particular configuration of property in Brazil, creditors tend to attribute greater relevance to the risk of change in control than to the benefits generated by the alignment of interests deriving from the concentration of ownership.

The results show that the perception of debenture holders (debt holders) about the effect of the cost of debt on the company's value differs from that of the outsider shareholders, that is, the question of the alignment effect and the entrenchment effect. In Brazil, the majority shareholders are often the company managers or maintain a very close relationship with the company management. Perhaps, for creditors, a less than ideal decision is more pertinent than a change in risk. For example, as explained in Jiraporn et al. (2013), if management acts predominantly on behalf of the shareholders, it may start to sub-invest in a project of positive net present value, because the benefit would accumulate mainly for the debt holders.

Finally, given the methodological decisions made to execute the research, the results come with some limitations. First, the results obtained are limited to the sample of debenture series analyzed, as the analysis of the cost of debt included only the series of debentures that use remuneration in the DI rate format plus a fixed percentage rate, as detailed in section 3. Each debenture issue contract tends to have many specificities, which were not addressed in the analysis of the grouped data. Another limitation is that the ownership and control structure can also be analyzed from other perspectives. For example, the identity of the controlling shareholder can be considered, in which the literature appoints a difference in the perception of the firm's value when the control is individual or family, state, institutional, national or foreign, for example. In addition, as the analysis is developed for direct shareholding, future research could consider pyramidal shareholdings, that is, indirect shareholdings that tend to demonstrate a concentration of control where apparently there would not exist any. Finally, the analysis is not conducted for other forms of corporate financing, which are sometimes used concurrently with financing by debentures, such as bank loans and intragroup loans. The results of this research can be further refined, simultaneously taking into account the cost of other sources of financing, the identity of the controlling shareholder and even characteristics of the board of directors.

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Coping Strategies Adopted by Accounting Students

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Abstract

Objective: Coping are changes in cognitive and behavioral efforts in order to deal with stress and displeasure. This study analyzes the association between coping strategies, considering the characteristics of higher education Accounting students in Curitiba, PR.

Method: The sample consists of 311 students from two higher education institutions (HEI) from the city of Curitiba, PR. The data collected by means of a survey were treated using Spearman's Correlation and Kruskal-Wallis' non-parametric test (K-W).

Results: The main associations are registered between the distraction strategies embodied in doing other more pleasant things and thinking less about the problem and/or the situation of stress and displeasure, and conversion and additivity, such as the adoption of practices related to legal and illegal drugs use. It is noted that the participants, when analyzed by gender, higher education institution, and age group, presented different levels of agreement, considered as significant in relation to the dimensions Control, Distraction and Refusal, Social Support, Withdrawal and Conversion, and Additivity. It is also noted that the course semester the students are enrolled in drives them different and significantly in the search for social support in the face of stress and displeasure.

Contribution: This study contributes by presenting an explicit standard design of the manifestations of coping strategies adopted by Accounting students.

Keywords: Coping strategy; Accounting Education; Brazilian Accounting Students.

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1. Introduction

Coping corresponds to changes in cognitive and behavioral efforts in order to manage adversities that overwhelm and exceed the natural capabilities of individuals (Lazarus & Folkman, 1984). Thus, the coping strategies represent cognitive-behavioral coping efforts to minimize or avoid threats, damage, or losses in response to stress-inducing agents and emotions that permeate the different social environments (Gloria & Steinhardt, 2016; Costa & Leal, 2006; Cardoso, 1999).

From the cognitive perspective, coping can be understood from a problem-focused and from an emotion-focused viewpoint (Folkman & Lazarus, 1980). Problem-focused coping is represented by attitudes that aim to deal with and solve certain situations. This type of strategy is typically adopted when the individual judges the problem to be circumventable. Emotion-oriented coping is characterized by avoidance strategies, adopted in case of doubt as to whether the problem is circumventable. The emotion-based strategies can be harmful to the individual, being part of attitudes of escape, isolation, alcohol and legal or illegal drug consumption to mitigate the pressures experienced in different contexts (Antoniazzi, Dell'Aglio & Bandeira, 1998; Pereira & Branco, 2016).

Researchers (Costa & Leal, 2006; Pacheco, 2008; Carlotto, Câmara, Otto & Kauffmann, 2010; Carlotto, Teixeira & Dias, 2015) have strengthened the arguments that observing the students' coping strategies allows us to understand stressful situations that imply professional training, in the posture towards uncertainties about the professional career and in the interpersonal relationships students experience in the academic environment. Studies in the health area (Aiken & Sloane, 1997; Antoniazzi, Dell'Aglio & Bandeira, 1998; Hammer, Grigsby & Woods, 1998; Suehiro, Santos, Hatamoto, & Cardoso, 2008; Pacheco, 2008; Carlotto et al., 2010; Maturana & Valle, 2014; Bassols et al., 2015; Gloria & Steinhardt, 2016) underline the institutions' need to commit to their students' professional development, as the university education process entails excessive exposure to vulnerability, pressure, and compliance with targets, among other conditions perceived as stressful and which impose on the individuals the need to develop strategies to adapt to this reality.

In Accountancy, researchers have tried to understand the cognitive and behavioral elements in the academic environment (Lim, Tam & Lee, 2013). Lim, Tam and Lee (2013) discussed the relationships between perceived stress, coping strategies, and the health of 1,785 Accountancy students from Malaysia. The results indicated that the level of stress the students perceived is associated with coping strategies manifested in the university environment. This result promotes the development of studies that broaden the analysis of actions for the improvement of coping strategies among educators, students and disciplinary teams of Accounting courses, as this attribute of student behavior showed to be associated with stress.

Thus, this research intends to analyze the association between the coping strategies of Accounting students from HEIs in Curitiba (PR). In addition, we verify the conditioning of these coping strategies according to the respondents' observable characteristics. Hence, we seek to answer the following problem question: **What is the association between the coping strategies of Accounting students at higher education institutions in Curitiba (PR)?**

The problem identified in this research is important, as it contributes to the expansion of discussions and understanding of how future professionals face situations of adversity and stress in the academic environment. It is acknowledged that, since the first years of the course, undergraduate students are exposed to situations that involve professional and academic responsibilities, emotional exhaustion and stress. This scenario is relevant to the entry into higher education, which proposes to the student a teaching-learning environment that is totally different from secondary education. This distinction ranges from the pedagogical relationships, which are practiced and recommended in this environment, to the metrics for measuring this individual's performance (Araújo, Almeida, & Paúl, 2003; Veiga & Lopes, 2020).

Restricting this research to Accountancy students becomes relevant because most of the members of this group have a double journey (Peleias, Guimarães, Chan, & Carlotto, 2017); many of these students, throughout the undergraduate course, are professionally active in Accounting and start to reconcile academic and professional responsibilities simultaneously (Vargas & Paula, 2013; Souza & Durso, 2018). It is known that the Accountancy course has high permeability in the job market. This characteristic is relevant, as security and stability are prioritized elements in the career prospecting of Accountancy students (Lopes & Meurer, 2019). On the other hand, it represents an exhausting fact and becomes a source of tensions, such as the manifestation of the burnout syndrome (Peleias et al., 2017) and anxiety traits (Reis, Miranda & Freitas, 2017) as, in addition to being exposed to a new teaching-learning configuration, they are continuously exposed to the normative changes typical of the profession, which require skills related to emotional and technical intelligence (Cook, Bay, Visser, Myburgh, & Njoroge, 2011).

The theme shifted to the accounting education environment is important, as it maps which are the coping strategies accounting students from Brazilian educational institutions adopt to promote well-being in the academic environment. In the long term, this mapping can serve as strategic information for educational institutions that seek to adopt mechanisms to minimize stress-inducing situations and emotions that permeate the different social environments, as the behavior students assume in the academic environment is a consequence of their emotional state and reflective learning (Lopes, Meurer & Voese, 2018). In Malaysia, for example, the high stress level of 2,354 students resulted in a corrective action program by the national government (Lim, Tam & Lee, 2013).

The findings of this research can help to improve the professional education environment of students and to reduce the transfer of stressful behaviors to the job market and to the individuals' social life (Meriac, 2012), as it illustrates an explicit standard design of the manifestations of the coping strategies students adopt. In addition, understanding how coping with stressful situations occurs in the academic environment promotes the improvement of strategies to deal with disciplinary problems, as it arouses reflections on situations that lead to pressures and adversities that contrast with the socio-academic space.

2. Theoretical Framework

2.1 Coping strategy

Besides biological stress, referring to the basic condition for life, people are exposed to various situations arising from their social life that cause and manifest stress. In response to these processes, coping strategies represent a way to manage these threats and the harmful effects of the stress that is present in the situations experienced with a view to achieving a state of well-being (Vasconcellos, 2017).

Lazarus and Folkman (1984) define coping as "changes in cognitive and behavioral efforts, used by individuals to deal with specific internal or external demands, which are assessed as overloading or exceeding their personal resources" (Lazarus & Folkman, 1984, p.141). Essentially, coping strategies represent a conscious mobilization of resources in the subject's behavioral response to stressful and unpleasant situations (Vasconcellos, 2017), that is, it is the result of a person-environment transaction (Latack & Havlovic, 1992).

Coping strategies can be segregated into the dimensions Control, Social Support, Withdrawal, Distraction or Refusal and Conversion and Additivity (Esparbès, Sordes-Arder & Tap, 1993), as shown in Figure 1.

Dimensions	Description
Control	It implies self-control of the situation (resisting the urge to make thoughtless judgments, and to make hasty decisions; having time to act), the coordination of behaviors or activities (outlining goals, making a plan, treating the problem in an abstract and logical way) and the containment of emotions (not panicking, not showing others the emotions they experience).
Social Support	It covers the request, desire or need for help in cooperative (joint work), cognitive (request for advice and information) and affective (need for listening, acknowledgement or encouragement) terms.
Withdrawal	It implies a trend to isolate oneself from the outside world (social distancing), an effort not to think about the problem (taking refuge in the imaginary or in the dream) or having difficulties to describe their emotions and feelings (alexithymia).
Distraction or Refusal	It means acting as if the problem did not exist, developing activities to distract oneself or "forgetting" the problem.
Conversion and Additivity	It includes changes in behaviour (depending on the problem) or cognitive positions (allowing to accept the situation or learn to live with it), the centralization of ways of solving the problem, after analyzing it, as well as the adoption of compensatory behaviors (drugs, medicines, tobacco).

Figure 1. Dimensions of *Coping* Strategies in Higher Education.

Source: elaborated based on Esparbès, Sordes-Arder and Tap (1993)Costa e Leal (2006).

As highlighted in Figure 1, multiple possibilities and manifestations of coping exist. This plurality of coping with situations of stress and displeasure leads to an associative process between the coping strategies, as "coping [represents] a reaction to the stress situation, it can also generate, by itself, a new stress situation, different from the initial one" (Vasconcellos, 2017, p.290), bringing the subject to adopt a new coping strategy. Thus, Vasconcellos (2017, p.288) highlights that "although we have developed a coping strategy to deal with the unfavorable situation, this strategy can generate problems later, which will add to those already manifested. We all know of cases in which the "solution" aggravates the pre-existing problem even further". Figure 2 presents the description of the multiple possibilities and manifestations of coping and the emergence of a new stressful situation.

Multiple possibilities and manifestations of *coping* and the emergence of a new stress situation	Description
Eucoping-eustress	The processed strategy generates a state of pleasant relief, but with strong activation of stress.
Eucoping-distress	Although effective, the *coping* strategy generates a new state of negative stress for the organism.
Discoping-eustress	A very bad strategy, but generates a pleasant level of stress.
Discoping-distress	When an ineffective *coping* strategy generates an unpleasant stress situation.

Figure 2. Multiple possibilities and manifestations of *coping* and the emergence of a new stress situation

Source: elaborated based on Vasconcellos (2017), p. 290.

Based on Figure 2, it is argued that coping strategies are associated as, by developing this behavioral characteristic towards stressful and unpleasant situations, this action can cause more problems, which will add to those already manifested. That will lead the individual to dynamics in this phenomenon.

2.2 Empirical Evidence

Studies on coping strategies provide evidence to understand the behavior of individuals exposed to stressful situations internal and external to the academic and professional environment (Lazarus & Folkman, 1984; Tamayo & Tróccoli, 2002; Costa & Leal, 2006). Thus, the ways of managing adverse situations entail implications regarding the behavior and mental health of college students. Karaca et al. (2019) appointed that the use of optimistic strategies to solve problems is beneficial to mental health and that students who adopt strategies of avoidance or refusal are at higher risk of presenting mental problems. On the other hand, the different forms of coping, besides being related to the mental health of college students (Karaca et al., 2019; Gil-Monte, 2005), may be linked to other attributes present in the socio-academic space. Moretti and Hübner (2017) discussed how academic routine interferes with undergraduates' stress levels. In the study, 184 students were investigated, who considered that the academic routine has a negative influence on the stress level. The study revealed that the student-teacher relationship, the number of tests and papers, the outdated and obsolete teaching methods are variables that intensify manifestations of stress and emotional exhaustion in the students. The results indicated the need for new educational policies, for the adoption and development of programs that mitigate the events identified as causing stress and emotional exhaustion, and even the need for therapeutic interventions involving the students (Moretti & Hübner, 2017).

Hirsch et al. (2015) discussed that students satisfied with their experiences in the college environment tend to adopt coping strategies linked to the reassessment of problems and the planning of possible solutions to adverse situations. On the other hand, dissatisfied students adopt negative strategies of denial of the problem, distancing, distraction and resignation, seeking to escape from unpleasant situations.

Lim, Tam and Lee (2013) investigated 1,785 accounting students from three public universities and two private universities to discuss the association between perceived stress, coping strategies and health. The results indicated that health-related aspects measured by means of (i) somatic symptoms, (ii) anxiety and insomnia, (iii) social dysfunction and (iv) depression are negatively associated with coping strategies. It was also noted that the stress the students perceived is positively associated with the coping strategies.

Among the discussions listed, concerns are focused on understanding how these different behaviors are associated and affect both individuals and the socio-academic space. When faced with stressful situations, pressure and emotional exhaustion, the students have the choice to adopt coping strategies that benefit the development of their academic trajectory or not. Coping strategies related to refusal, distraction and withdrawal can result in disinterest, discouragement and fragility in the teaching-learning process (Gibbons, Dempster & Moutray, 2010). On the opposite, students who adopt strategies based on problem coping, seeking family support, and on social support have lower levels of stress and strengthen their resiliency (Costa & Leal, 2006; Hirsch et al., 2015).

Coping strategies are effective when they help the individual to face the problems and reduce the tensions caused by stressful and unpleasant events, implying a search for adaptation to the situation that is experienced (Vinay, Esparbès-Pistre & Tap, 2000). This adaptability of active and planned coping tends to provide better results, as opposed to denial strategies that often result in unwanted consequences (Lazarus & Folkman, 1984; Brown, Westbrook, & Challagalla, 2005), such as refusal behaviors, low emotional resiliency and low level of self-confidence.

3. Methodological Procedures

3.1 Population and Sample

The research population includes the students enrolled in Accountancy courses at two higher education institutions (HEI) in Curitiba (PR), one public and one private. Thus, the non-probabilistic sample consists of 311 students who fully answered the research instrument.

3.2 Research Instrument

The research instrument consists of two blocks. The first deals with coping strategies that cover problematic and stressful situations the students experience in the academic environment. In this block, we chose the instrument used by Costa and Leal (2006), who applied the scale of Esparbès, Sordes-Arder and Tap (1993) to the context of higher education in Portugal. It is noteworthy that, for the Brazilian context, Chamon (2006) validates the scale of Esparbès, Sordes-Arder, and Tap (1993) in a sample of nurses, nursing technicians and auxiliary nurses from a hospital and bank clerks. Due to the fact that the study of Chamon (2006) is focused on a group different from the one investigated in this research, we chosen the instrument already validated for the Portuguese university context.

Thus, this block of the research instrument contained 54 closed assertions and was validated for the sake of validation to the Brazilian educational context. This process initially involved five researchers in Accounting Education and the course coordinators of the institutions where the research was carried out. The researchers participated in the validation of the instrument by assessing for dubious meanings, approximation to the research participants and relevant language for the undergraduate Accountancy course. For example: ex ante (i) - "I confront the problem", ex post (i) "I tackle the problem head on".

The coordinators, in addition to acting in the same condition as the researchers, contributed to the assessment on the applicability of the coping strategies listed to the different behaviors of the undergraduate Accountancy students. For example: ex ante (i) - "I confront the problem"; "I face the situation"; "I go directly to the problem"; ex post (i) "I tackle the problem head on". Thus, after this process, a shorter research instrument with 32 assertions was elaborated, as shown in Figure 3.

Block	Construct	Number of Assertions Original Instrument	Number of Assertions Adapted Instrument	Reference
I	Control	15	6	Costa and Leal (2006) and Esparbès, Sordes-Arder and Tap (1993)
	Distraction and Refusal	12	9	
	Social Support	7	5	
	Withdrawal	8	5	
	Conversion and Additivity	8	7	

Figure 3. Composition of the Research Instrument

Source: research data.

Based on Figure 3, it is argued that coping strategies in the Brazilian university environment assume the dimensions Control, Distraction and Refusal, Social Support, Withdrawal and Conversion and Additivity. Therefore, an evaluation scale was adopted; the respondent was asked to give a score of 1 to 10, with 1 = I hardly agree and 10 = I totally agree. This scale structure was chosen for semantical reasons By means of the second block, the characteristics of the 311 respondents could be surveyed. This block consisted of three closed questions, which identified gender, course semester and type of HEI, and one open question to identify the age.

3.3 Ethical Issues

Prior to the application of the survey, some care was taken. The scale developed by Esparbès, Sordes-Arder and Tap (1993) and applied in the Portuguese context by Costa and Leal (2006) has a non-pathological character, therefore, it is free and its application does not require authorization and/or payment. At the time of the application of the questionnaire, the four characteristics of the research were presented to the respondents as follows: (i) the researchers provided the students with the Free and Informed Consent Form (FICF), (ii) the potential respondents were notified that participation in the survey was voluntary and anonymous; (iii) in addition, the student could interrupt the completion of the instrument at any time without any damage or loss to him/her; and (iv) the processing of the data would be confidential to preserve the students' individuality and anonymity.

3.4 Data Collection and Processing

Qualified researchers applied the surveyin loco. Authorization was requested from the Accounting departments of the higher education institutions to apply the questionnaire to the students in October and November 2018. Finally, the average time to complete the research instrument was approximately eight minutes.

After the data collection, the data were organized in Microsoft Office Excel® and treated from two perspectives. The first is the analysis technique called Spearman's correlation, due to the non-normality of the data verified by the Kolmogorov-Smirnov test, histogram analysis, and normal Q-Q graph. The correlation coefficient ranges between -1 and 1 and the correlation can be classified as strong, medium, weak (Cohen, 1988; Brites, 2007). In this study, the coefficients were interpreted as follows: 0 absence of correlation; +/-]0 – 0.25] very weak correlation; +/-]0.25 – 0.40] weak correlation; +/-]0.40 – 0.60] medium correlation; +/-]0.60 – 0.75] strong medium correlation; +/-]0.75 – 0.90] strong correlation; +/-]0.90 – 1[very strong correlation; +/- 1 perfect correlation. The signal informs the sense of the association between the analyzed variables, whether positive or negative (Brites, 2007).

The second perspective takes the form of the Kruskal-Wallis nonparametric test (K-W) to identify differences in the Mean Ranking between groups, using a 5% significance level. The Kruskal-Wallis test analyzes the average classification of each cluster in order to identify statistical differences between distinct clusters (Field, 2009).

4. Analysis of Results

4.1 Respondent Profile and Descriptive Statistics

Table 1 shows the research respondent's profile. Thus, the results of this research cover the perception of students from two HEIs in Curitiba (PR).

Table 1
Sample profile

Gender	F	%	Semester	F	%
Female	161	51.77	1st / 2nd semester	125	40.19
Male	149	47.91	3rd / 4th semester	101	32.48
Agender or Non-Binary	1	0.32	5th / 6th semester	77	24.76
I prefer not to answer	0	0.00	7th / 8th semester	8	2.57
Age*	**F**	**%**	**Higher Education Institution**	**F**	**%**
From 17 years to 19 years	80	25.72	Public	224	72.02
From 20 years to 21 years	87	27.97	Private	87	27.98
From 22 years to 25 years	78	25.08			
From 26 years to 47 years	66	21.22			

Obs.: f = Frequency; % = percentage.

Source: research data.

As observed in Table 1, more than 50% of the survey respondents identify themselves as female; the majority are 20-21 years old (27.97%); in the first year of the Accountancy course (40.19%); and enrolled in a public institution (72.02%). Table 2 shows the mean, median, mode and standard deviation of each assertion of the *coping* strategy scale.

Table 2

Descriptive Statistics

Coping strategies	ME	MD	MO	SD	*Coping* strategies	ME	MD	MO	SD
C1 - I confront the problem.	7.74	8	8	1.87	C17 - I ask help to a higher god. which I believe in.	5.48	6	1	3.47
C2 - I analyze the situation to better understand it.	8.33	9	10	1.71	C18 - I work in a group with people to forget about the situation.	3.80	3	1	3.11
C3 - I set objectives to be achieved.	8.09	8	10	1.76	C19 - I try to seek help from my friends to allay my anxiety.	5.35	5	1	2.95
C4 - I accept that the problem needs to be solved.	8.38	9	10	1.67	C20 - I ask people who have gone through a similar situation how they solved the problem.	6.24	7	8	2.84
C5 - I panic.	4.20	3	1	2.82	C21 - It is difficult to use words to describe how I feel about a difficult situation.	5.16	5	1	4.06
C6 - I Increase my efforts to solve the problem.	7.76	8	8	1.91	C22 - I feel overwhelmed by my emotions.	4.75	5	5	2.67
C7 - I do something else more pleasant and avoid thinking about the situation.	4.38	4	1	2.65	C23 - I keep my feelings to myself.	6.32	7	10	2.73
C8 - I act when the situation allows me to.	6.76	7	8	2.39	C24 - I avoid meeting with people.	4.33	4	1	2.79
C9-I try to perform group activities.	6.54	7	8	2.62	C25 - I feel guilty about the problem.	4.83	5	1	2.94
C10 - I do other activities to think less about the situation.	4.73	5	5	2.66	C26 - I constantly ask for advice from professionals (teachers. doctors. psychologists).	4.81	5	1	3.12
C11 - My emotions disappear as quickly as they appear.	4.97	5	1	5.42	C27 - I make action plans and try to apply them.	6.61	7	8	2.51
C12 - I tell myself that this problem does not matter.	3.89	3	1	2.71	C28 - I change my behavior depending on the situation.	6.11	7	8	2.64
C13 - I take the situation I find myself in in a healthy way.	4.57	4	1	3.02	C29 - I get aggressive towards other people.	3.56	3	1	2.76
C14 - My feelings are unchanged when difficulties arise.	4.52	4	1	2.84	C30 - I use licit drugs (alcoholic beverages. cigarettes. among others) to allay my anguish.	2.76	1	1	2.93
C15 - I react as if the problem did not exist.	3.25	2	1	2.55	C31 - I use illicit drugs to allay my anguish.	1.91	1	1	2.12
C16 - I discuss the problem with my relatives.	4.76	5	1	3.15	C32 - I forget my problems taking medications.	1.73	1	1	1.99

Obs.: ME = Mean; MD= Median; MO = Mode; SD = Standard deviation.

Source: research data.

In terms of homogeneity between the coping strategies, we note the acceptance that the problem needs a solution (C4), along with an analysis of the situation to better understand it (C2) and a definition of the objectives to be achieved (C3), which obtained the highest modes and the lowest standard deviation. This fact indicates that most of the students agree with the need to resolve adversities that they are actively exposed to, analyzing the situation and defining the objectives that need to be achieved in overcoming these situations. These positive connotation strategies are important as avoidance postures are appointed as harmful to the psychological state of the individual (Chang et al., 2006).

Medication use (C32), illicit drug use (C31), and reactions as if the problem did not exist (C15) obtained the lowest modes and standard deviation. In that sense, few students agree to the use of illicit substances or adopt strategies to avoid stressful situations. Despite the low occurrence of these strategies, it is necessary to identify this group of students and help them in adopting forms of coping focused on proactive actions, which permit overcoming adversities without using substances that may harm health or avoidance actions.

Finally, the fact that students' emotions disappear as quickly as they appear (C11) and that they have difficulty in using words to describe what they feel towards a difficult situation (C21) obtained the greatest standard deviation. This indicates non-agreement and distinct positioning among the respondents regarding these coping strategies. This disparity can be justified by the fact that the students who took part in the research mainly come from the first two years of the undergraduate course, a period of adaptation and coping with different situations regarding the construction of identity and socio-academic life.

4.2 Inferential Analysis

To analyze the association between the coping strategies, Spearman's correlation was used between the assertions representing each dimension of the coping strategies the students in the sample practiced. Applying Brites' criterion (2007) concerning the strength and significance of the correlation, only the main associations per construct are described. In addition, the tests for intergroup differences were applied in each analyzed construct. As can be observed in Table 3, the coping strategies that represent the Control dimension with the strongest associations take the form of facing the problem head on (C1), analyzing the situation to better understand it (C2) and the process of setting objectives to be achieved (C3).

Table 3

***Coping* Strategy: Control**

		C2	C3	C4	C5	C6
C1 - I confront the problem.	1.000					
C2 - I analyze the situation to better understand it.	0.490**	1.000				
C3 - I set objectives to be achieved.	0.497**	0.562**	1.000			
C4 - I accept that the problem needs to be solved.	0.435**	0.553**	0.532**	1.000		
C5 - I panic.	-0.253**	-0.172**	-0.120*	-0.139*	1.000	
C6 - I Increase my efforts to solve the problem.	0.490**	0.455**	0.523**	0.496**	-0.139*	1.000
Intergroup Comparison						
Female	**167.43**	**168.86**	159.10	160.11	**135.34**	152.82
Male	**144.66**	**143.11**	151.87	151.87	**177.47**	160.38
p-value	**0.018**	**0.008**	0.319	0.617	**0.000**	0.215
Private HEI	148.13	**133.58**	151.27	140.81	150.95	**137.99**
Public HEI	159.06	**164.71**	157.84	161.90	157.96	**163.00**
p-value	0.327	**0.005**	0.555	0.056	0.533	**0.025**
From 17 years to 19 years	143.91	157.22	158.56	154.53	156.98	164.77
From 20 years to 21 years	164.31	163.44	166.70	170.61	157.13	159.37
From 22 years to 25 years	152.62	148.37	144.90	151.50	153.89	144.79
From 26 years to 47 years	163.70	153.74	151.92	143.84	155.83	154.17
p-value	0.409	0.733	0.434	0.267	0.995	0.533
1st / 2nd semester	157.57	166.42	169.48	164.94	149.25	170.83
3rd / 4th semester	141.77	138.87	137.25	142.34	168.47	144.80
5th / 6th semester	167.57	162.83	159.38	158.08	151.24	145.03
7th / 8th semester	199.69	143.69	149.56	168.75	149.94	171.25
p-value	0.114	0.098	0.053	0.262	0.399	0.088

Obs.: ** *p-value* < 0.01;* *p-value* < 0.05.

Source: research data.

Facing the problem head on (C1) is positively associated with analyzing the situation to better understand it; (C2) with setting the objectives to be achieved; (C3) with the need to solve the problem; (C4) and with increasing efforts to solve the problem (C6). The second coping strategy refers to analyzing the situation to better understand it (C2). This action is positively associated with setting the objectives to be achieved (C3), with accepting the need to solve the problem (C4) and with increasing efforts to solve the problem (C6). A negative relationship also exists with panicking (C5). The third strategy that draws the researchers' attention in associative terms refers to setting the objectives to be achieved (C3). This form of coping is positively associated with the need to solve the problem (C4) and with increasing efforts to solve the problem (C5).

As for the intergroup comparison, when segregated by gender (female and male), the participants present different levels of agreement, and this can be considered significant to face the problem head on (C1), analyze the situation to better understand it (C2) and panic (C5). With regard to belonging to a public or private HEI, a significant difference exists in terms of facing the problem head on (C1) and increasing efforts to solve the problem (C6). These findings indicate that female respondents tend to face problems head on, not to panic, analyze adversities and understand them in order to subsequently make some decision in a more intense and planned manner than male participants. Similarly, the findings indicate that public college students face problems head on and increase efforts to solve their problems more intensely than private college students. These results imply the importance of observing and seeking to shape the behavior of male respondents and from private HEIs, as Karaca et al. (2019) reinforce that facing adversities actively reduces the losses caused by avoidance strategies adopted in stressful situations, because this proactive posture maximizes the individual's self-confidence.

Another aspect concerning these results refers to the students' autonomy in the face of the problem situation. There are indications that the support the organization offers guarantees greater autonomy and control over the employees' work (Aiken & Sloane, 1997; Tamayo & Tróccoli, 2002). Thus, acknowledging that the coping strategies are the result of the person-environment transaction, it is inferred that the socio-academic environment tends to lead the students to adopt coping strategies more or less intensely (Latack & Havlovic, 1992).

Hirsch et al. (2015) argue that the correct use of coping strategies contributes to promote the students' quality of life. Hence, the Accountancy students seek to master the situations they are confronted with in the academic environment and sometimes do not act unwisely. The active nature of the control strategies to solve the problems, analyze the situation, set goals and develop efforts to overcome the situation represent strategies that, when positively associated, contribute to the construction of the student's academic trajectory.

Higher education provides the Accountancy students with contingencies. Situations related to the new responsibilities, lack of time (Moretti & Hübner, 2017) and the double journey (Peleias, Guimarães, Chan, & Carlotto, 2017) can "produce responses of fear and anxiety that can negatively affect the adaptive capacity, causing functional losses or consequences on the quality of life, social relationships and even academic performance" (Moretti & Hübner, 2017, p.259). On the other hand, when the students adopt strategies based on problem coping, there are indications that they tend to present lower levels of stress and their resiliency is fostered (Costa & Leal, 2006; Hirsch et al., 2015). This process represents positive gains in academic performance, as the student who masters the situation and/or is prone to dealing with situations of conflict, stress and emotional exhaustion can develop attention, concentration and decision-making skills (Moretti & Hübner, 2017).

The socio-academic context can develop structures that encourage students to adopt strategies to deal with the problem in a more active way, a fact that can promote academic performance and personal and professional skills, as educational institutions assume a more active and enforcement role towards changes in cognitive and behavioral efforts students make in the face of conflicting situations (Gibbons, Dempster & Moutray, 2010; Lazarus & Folkman, 1984).

In Table 4, the associations between the coping strategies in the distraction dimension and the intergroup comparison are highlighted. In this respect, three associative occurrences are highlighted that draw the researchers' attention.

Table 4

***Coping* strategy: Distraction**

		C8	C9	C10	C11	C12	C13	C14	C15
C7 - I do something else more pleasant and avoid thinking about the situation.	1.000								
C8 - I act when the situation allows me to.	0.286**	1.000							
C9-I try to perform group activities.	0.053	0.263**	1.000						
C10 - I do other activities to think less about the situation.	0.651**	0.195**	0.106	1.000					
C11 - My emotions disappear as quickly as they appear.	0.239**	0.161**	0.178**	0.218**	1.000				
C12 - I tell myself that this problem does not matter.	0.483**	0.224**	0.113*	0.432**	0.477**	1.000			
C13 - I take the situation I find myself in in a healthy way.	0.311**	0.181**	0.214**	0.305**	0.343**	0.545**	1.000		
C14 - My feelings are unchanged when difficulties arise.	0.075	0.104	0.289**	0.086	0.377**	0.259**	0.369**	1.000	
C15 - I react as if the problem did not exist.	0.363**	0.115*	0.118*	0.368**	0.337**	0.562**	0.549**	0.436**	1.000
Intergroup Comparison									
Female	151.98	157.74	163.14	157.45	161.69	152.21	162.63	**171.63**	164.57
Male	159.35	153.21	149.28	153.45	150.38	158.91	148.57	**139.94**	147.40
p-value	0.195	0.286	0.098	0.237	0.366	0.769	0.146	**0.003**	0.118
Private HEI	142.40	142.95	154.29	153.84	150.02	**137.09**	143.03	163.58	149.86
Public HEI	161.28	161.07	156.66	156.84	158.32	**162.57**	160.37	153.06	158.38
p-value	0.094	0.107	0.834	0.790	0.462	**0.023**	0.123	0.350	0.440
From 17 years to 19 years	154.11	155.57	146.49	160.46	139.76	140.56	146.80	145.77	140.00
From 20 years to 21 years	166.83	168.48	169.31	166.09	169.73	168.33	158.23	158.06	162.90
From 22 years to 25 years	144.61	144.13	142.35	143.64	162.61	152.06	156.99	159.74	160.71
From 26 years to 47 years	157.47	154.11	166.12	151.90	149.78	160.70	160.55	161.27	160.74
p-value	0.455	0.373	0.138	0.400	0.141	0.215	0.783	0.690	0.303
1st / 2nd semester	152.97	162.53	152.54	155.89	144.90	143.48	148.90	153.14	158.53
3rd / 4th semester	164.99	156.94	152.46	158.96	152.62	160.40	153.29	146.66	150.52
5th / 6th semester	151.10	146.45	166.18	154.55	176.87	164.61	166.95	173.67	157.33
7th / 8th semester	136.94	134.06	156.75	134.31	171.13	192.25	175.44	148.44	172.75
p-value	0.622	0.561	0.718	0.895	0.089	0.187	0.489	0.229	0.846

Obs.: ** *p-value* < 0.01;* *p-value* < 0.05.

Source: research data.

The results of Table 4, show that the action of doing something else more pleasant and avoiding thinking about the situation (C7) is positively associated with doing other activities to think less about the situation (C10) and with a self-affirmation related to the non-importance of the problem (C12). Regarding the actions of self-affirmation regarding the non-importance of the problem (C12), we note a positive association with the actions of performing other activities to think less about the situation (C10) and with the fact that the emotions of the student disappear as quickly as they appear (C11). In addition, there is an association between taking the situation in a healthy way (C13) and the adoption of strategies as if the problem did not exist (C15). Taking the situation in a healthy way (C13) is positively associated with not changing one's feelings towards the difficulties (C14) and with reacting as if the problem did not exist (C15).

A significant difference exists between the groups concerning the coping strategy of distraction. The level of agreement differs between the female and male students, with statistical significance as to not changing one's feelings when difficulties arise (C14). When aiming to identify differences between the participants' affiliation with a public or private HEI, a significant difference is found in the fact of self-affirmation regarding the non-importance of the problem (C12).

Thus, female participants have greater sentimental changes than male participants, but these changes do not prevent them from planning decision-making and facing the problems head on, as previously analyzed. In relation to the public college students, It is noticed that this group adopts strategies of denial of the stressful and unpleasant situation more intensely. This attitude can compromise the student's ability to adapt to similar situations (Costa & Leal, 2006; Hirsch et al., 2015). On the other hand, this process of denial may be based on hope and optimism (Lazarus & Folkman, 1984; Tamayo & Tróccoli, 2002). Therefore, it is up to the educational institution and the students themselves to seek ways to strengthen their self-confidence in order to leverage their ability to react to stressful situations.

The key point regarding the self-affirmation of the non-importance of the problem is the students' selective attention (Tamayo & Tróccoli, 2002) towards stressful and unpleasant situations. Moretti and Hübner (2017, p.259) highlight that "the production, dissemination and assimilation of knowledge mobilize cognitive, social, physical and emotional aspects that cross the entire academic education process". In view of these demands for attention, it is noted that denying the problem can be a strategy that aligns with the interests of Accountancy students. Therefore, reflection is due on how this actions affects performance and behavior in the socio-academic environment.

When confronted with situations that induce stress, pressure and emotional exhaustion, the students prioritize strategies of distancing from the problem. In other words, they prefer to do another more pleasant activity that is more in line with thinking less of the situation and seeking self-affirmation that the problem is not important. This posture can also be harmful to their professional development because the higher education process requires that the students expose themselves to vulnerability, pressure, compliance with goals and deadlines (Antoniazzi, Dell'aglio & Bandeira, 1998; Hammer, Grigsby & Woods,1998). In fact, this exposure contributes to the development of skills that will be used in the job market.

This attempt to distract oneself in view of a problem, or even forget it, shows to be a less effective strategy (Vinay, Esparbès-Pistre & Tap, 2000) and can cause unwanted results for the students, as they do not lead to the development of their resiliency (Lazarus & Folkman, 1984; Brown, Westbrook, & Challagalla, 2005; Costa & Leal, 2006; Hirsch et al., 2015). Consequently, academic performance, interpersonal relationships developed in the academic environment, satisfaction with the undergraduate course and career prospects are attributes of the student's life that can be impaired, as the problem and stress situations are closely linked and make up the academic structure of higher education.

Hirsch et al. described that (the 2015 p. 784), "the correct use of *coping* strategies can alleviate stress levels and promote a better quality of life for these students". On the other hand, in the long-term, less active coping strategies targeting distraction "might entail consequences for the students' health, such as, for example, in the development of burnout (Gil-Monte, 2005), and foster in students the development of (i) somatic symptoms; (ii) anxiety and insomnia; (iii) social dysfunction, and (iv) depression, given that these are the elements that make up the individual's health (Lim, Tam & Lee, 2013). The results regarding the distraction strategies the students adopt serve as alerts to the educational institutions that should promote the development of psychosocial support programs with the ability to guide the students in the resolution of conflicts that arise in the academic environment. Table 5 shows the associations between the coping strategies related to social support and the intergroup comparison.

Table 5
***Coping* strategy: Social Support**

		C17	**C18**	**C19**	**C20**
C16 - I discuss the problem with my relatives.	1.000				
C17 - I ask help to a higher god, which I believe in.	0.380**	1.000			
C18 - I work in a group with people to forget about the situation.	0.264**	0.365**	1.000		
C19 - I try to seek help from my friends to allay my anxiety.	0.398**	0.293**	0.384**	1.000	
C20 - I ask people who have gone through a similar situation how they solved the problem.	0.393**	0.285**	0.263**	0.584**	1.000
Intergroup Comparison					
Female	146.51	147.30	150.21	145.72	151.11
Male	165.32	165.37	162.99	165.46	160.37
p-value	0.052	0.201	0.205	0.100	0.203
Private HEI	140.86	154.66	148.95	140.95	**128.58**
Public HEI	161.88	156.52	158.74	161.18	**166.65**
p-value	0.062	0.868	0.381	0.073	**0.001**
From 17 years to 19 years	157.34	151.74	152.81	**132.51**	**146.33**
From 20 years to 21 years	165.61	154.23	165.25	**177.37**	**170.37**
From 22 years to 25 years	146.47	154.44	141.54	**144.01**	**137.06**
From 26 years to 47 years	152.97	165.34	164.76	**167.77**	**171.17**
p-value	0.573	0.808	0.285	**0.005**	**0.035**
1st / 2nd semester	150.47	150.72	151.54	**137.10**	141.96
3rd / 4th semester	161.89	159.16	160.65	**164.49**	163.81
5th / 6th semester	157.03	162.77	158.10	**172.16**	167.36
7th / 8th semester	158.25	133.44	146.75	**166.88**	167.38
p-value	0.816	0.674	0.867	**0.028**	0.155

Obs.: ** *p-value* < 0.01;* *p-value* < 0.05.

Source: research data.

In view of the above, in Table 5, three associative dimensions are noteworthy. As for seeking to discuss the problem with relatives (C16), there is a positive association with asking for help from the higher deity, which is related to the student's faith (C17), with seeking help from friends in order to allay the situation that caused anxiety (C19) and with asking people who have gone through similar situations how they have solved the problem (C20). Concerning working in groups with people to forget the situation (C18), this occurs associated with asking for help from a higher deity, which is related to the student's faith (C17) and with seeking help from friends to allay the situation that caused anxiety (C19).

Using the group differences to better understand these coping strategies, a significant difference is observed between public and private college students regarding the strategy of questioning people who have gone through a similar situation how they solved the problem (C20). In these clusters of coping strategy, it is also identified that age represents a factor that will lead the student to adopt positions with significantly different levels, so seeking help from friends to allay the anxiety generated by the stressful and unpleasant situation (C19) and asking questions to people who have gone through a similar situation as t, how they solved the problem (C20) differs between these groups. Finally, the semester this participant is enrolled makes him seek help from friends to allay the anxiety generated by the stressful and unpleasant situation (C19) at a differentiated and significant level.

The fact that public college students seek counseling more often towards people who have gone through a similar situation indicates a strategy of reflection and search for interpersonal support towards third parties. Stressful and unpleasant situations can be improved and/or reduced as a result of social support (Tamayo & Tróccoli, 2002). Lim, Tam and Lee (2013) highlight that social support leads to the maintenance of individual health, as this reflects individuals' interpersonal relationships in their work environment and/or professional development (Tamayo & Tróccoli, 2002).

Age also conditions this behavior and indicates that people in higher age groups tend to provide greater openness in seeking support from third parties and friends. This behavior can be reflected in other spheres of the student's life, either in his work or in his social life. Thus, strengthening the joint work and the search for support from third parties indicates easiness in establishing relationships with other members of society, in line with some insights raised by Teixeira and Dias (2015).

Social support is an important strategy the students practiced. In response to the stressful situations in the academic environment, there is an escape to the family environment, to the circle of friends and also to people who have gone through similar situations, with a view to sharing the situation they are exposed to (Carlotto, Teixeira & Dias, 2015). This coping strategy is an action in which the student grants space for preventive interventions to occur from another person's perspective.

The detection of problems and stressful situations in the academic environment is confirmed in the practical situations of higher education, such as tests, deadlines, group work, and other concerns surrounding the construction of a professional identity. In view of this process, the joint solution of these situations through requests for advice and sharing of the bothersome situations can be beneficial for the student, as "the perception of availability of social support has important value as a protector of the impact of stress on health"(Costa & Leal, 2006, p. 191).

The social support identified through the relationships the students established have been positively linked with the resolution of problems and stressful situations in the academic environment, in line with the perspectives of Carlotto, Teixeira and Dias (2015). The social support received from family members, friends and individuals who have experienced similar problem-situations helps in decision-making, which represents a positive action for students who are immersed in the higher education structure.

This attitude adopted by the students will consequently be manifested in the job market, where they will perform their accounting functions. Thus, the social support found in the university environment in solving problems can be transferred to the professional environment. The Accounting area is one of the areas that has changed most in relation to innovative and technological processes, facts that cause stress and highlight the health-illness of future accounting professionals. At this point, we note the importance of educational institutions in terms of the development of pedagogical plans that consider the need for preventive policies that guarantee the students the sociability of their problems, as the coping strategies practiced at the university in the face of stressful situations can sometimes be reflected in the job market.

Table 6 shows the associations between the coping strategies in its retraction dimension and the intergroup comparison.

Table 6

***Coping* strategy: Withdrawal**

		C22	**C23**	**C24**	**C25**
C21 - It is difficult to use words to describe how I feel about a difficult situation.	1.000				
C22 - I feel overwhelmed by my emotions.	0.535**	1.000			
C23 - I keep my feelings to myself.	0.156**	0.100	1.000		
C24 - I avoid meeting with people.	0.319**	0.400**	0.316**	1.000	
C25 - I feel guilty about the problem.	0.406**	0.436**	0.318**	0.510**	1.000
Intergroup Comparison					
Female	148.30	**133.89**	155.28	151.61	145.90
Male	163.39	**179.52**	156.92	160.50	166.12
p-value	0.096	**0.000**	0.959	0.629	0.057
Private HEI	144.43	145.07	144.95	148.51	**137.56**
Public HEI	160.49	160.24	160.29	158.91	**163.16**
p-value	0.154	0.179	0.174	0.355	**0.023**
From 17 years to 19 years	169.76	151.72	142.24	146.79	164.87
From 20 years to 21 years	165.56	154.12	167.34	151.86	157.18
From 22 years to 25 years	138.90	156.29	168.30	168.00	156.69
From 26 years to 47 years	146.94	163.33	143.18	158.44	142.88
p-value	0.092	0.881	0.105	0.474	0.526
1st / 2nd semester	148.47	144.52	158.06	148.46	153.08
3rd / 4th semester	166.62	168.11	148.00	162.95	163.14
5th / 6th semester	155.31	158.41	162.29	156.14	150.70
7th / 8th semester	146.19	159.19	164.31	184.75	162.38
p-value	0.489	0.263	0.723	0.504	0.779

Obs.: ** *p-value* < 0.01;* *p-value* < 0.05.

Source: research data.

Two associative groups are observed in these coping strategies described in Table 6. As for the student feeling overwhelmed by emotions (C22), there is a positive association with the difficulty of using words to describe the feeling towards a difficult situation (C21), with the action of avoiding meeting people (C24) and with the feeling of guilt about the problem (C25). Regarding the feeling of guilt about the problem (C25), a positive alignment is identified with the difficulty to use words to describe the feeling towards a difficult situation (C21) and with the action of avoiding meeting people (C24).

In terms of intergroup comparison, the withdrawal strategy presented significant differences between gender and HEI. Between the genders, there is a significant difference regarding the participants feeling overwhelmed by their own emotions (C22). On the other hand, regarding HEI, the significant difference lies in the feeling of guilt about the problem (C25).

Hence, the male respondents showed a higher level of withdrawal in relation to emotions. This strategy is an "attempt to manage the emotional tension the event caused" (Hirsch et al., 2015, p.788). It is certain that belonging to the socio-academic environment generates a wide range of emotions, which are permeated by the need to develop new relationships, understand the teaching-learning process, which is distinct from secondary education, and understand the new pedagogical relationships the university proposed (Araújo, Almeida, & Paúl, 2003; Veiga & Lopes, 2020).

The public college students show a higher level of guilt about the problems faced. Guilt represents a factor that leads the students to adopt strategies to cope with stressful and unpleasant situations. In this context, several authors have addressed emotional resiliency, highlighting that it is important for individuals to have balance and control over their emotions in the face of adverse situations (Hirsch et al., 2015).

Among the students analyzed, there is a process of refusal, which positively aligns with being overwhelmed by emotions, difficulty to choose words to express the problem situation and emotional exhaustion, and the action of avoiding people. These processes represent alerts to the health of the future Accounting professional. In the long term, this fact can result in harm to this professional's career development. The job market now demands accounting professionals with emotional intelligence, which consequently contributes to the company's performance in terms of profitability, conquering new customers, and developing competitive advantages (Cook, Bay, Visser, Myburgh, & Njoroge, 2011).

Based on this scenario, withdrawal strategies can cause harm to students. Thus, in the university environment, there are characteristics and structures that best allow students to act towards efficient and effective problem solving, in order to provide reliable work experiences and avoid the development of coping practices that in the long term produce professional and interpersonal losses.

Table 7 shows the alignment between the coping strategies in their conversion and additivity dimension and the intergroup comparison.

Table 7

***Coping* strategy: Conversion and Additivity**

		C27	C28	C29	C30	C31	C32
C26 - I constantly ask advice from professionals (teachers, doctors, psychologists).	1.000						
C27 - I make action plans and try to apply them.	0.295**	1.000					
C28 - I change my behavior depending on the situation.	0.114*	0.267**	1.000				
C29 - I get aggressive towards other people.	0.048	-0.084	0.357**	1.000			
C30 - I use licit drugs (alcoholic beverages, cigarettes, among others) to allay my anguish.	0.066	-0.112*	0.197**	0.314**	1.000		
C31 - I use illicit drugs to allay my anguish.	0.075	-0.062	0.191**	0.273**	0.668**	1.000	
C32 - I forget my problems taking medications.	0.094	-0.084	0.118*	0.255**	0.478**	0.654**	1.000
Intergroup Comparison							
Female	154.53	**168.74**	164.67	151.35	**171.39**	162.78	155.97
Male	158.41	**143.04**	146.15	161.69	**139.74**	148.90	156.22
p-value	0.361	**0.016**	0.137	0.307	**0.001**	0.158	0.901
Private HEI	157.35	**126.45**	**130.87**	148.17	142.04	148.96	154.77
Public HEI	155.48	**167.48**	**165.76**	159.04	161.42	158.73	156.48
p-value	0.868	**0.000**	**0.002**	0.326	0.047	0.242	0.824
From 17 years to 19 years	143.67	141.43	149.04	145.24	166.44	**168.87**	158.63
From 20 years to 21 years	155.48	164.40	163.07	155.20	159.90	**164.30**	163.54
From 22 years to 25 years	152.21	150.96	153.72	162.47	146.33	**151.65**	150.86
From 26 years to 47 years	176.11	168.55	157.81	162.45	149.64	**134.60**	148.95
p-value	0.169	0.215	0.774	0.573	0.340	**0.009**	0.400
1st / 2nd semester	147.66	158.22	148.84	153.85	156.34	162.01	153.16
3rd / 4th semester	154.00	144.34	154.79	160.85	155.08	155.37	161.93
5th / 6th semester	174.45	167.23	169.42	154.97	160.20	150.65	155.69
7th / 8th semester	133.88	160.44	154.00	138.19	121.75	121.50	128.50
p-value	0.177	0.384	0.463	0.867	0.611	0.292	0.410

Obs.: ** *p-value* < 0.01;* *p-value* < 0.05.

Source: research data.

In the coping strategies in the conversion and additivity dimension, three associative groups are highlighted. As for the student changing behavior towards the situation (C28), this is associated with the fact that he presents aggressive behaviors towards other people (C29). The use of licit drugs, such as alcoholic beverages, cigarettes, among others (C30), proved to be a strategy positively associated with the fact that the student presents aggressive behaviors towards other people (C29), with the use of illicit drugs to allay the student's anguish (C31) and with the use of medications to forget the problem (C32). Finally, there is alignment between using illicit drugs to allay the anguish the student feels (C31) and the strategy of forgetting the problems by taking medications (C32).

The conversion and additivity strategy was another coping strategy which, when analyzed by groups, presented statistical significance. These, in turn, are present in the group sex, HEI and age. As for gender, there are significant differences in the coping strategies of making action plans and trying to apply them (C27) and using licit drugs (alcoholic beverages, cigarettes, among others) to allay the anguish (C30). In the comparison between the public and private HEI group, the difference lies in the strategies of making action plans and trying to apply them (C27) and in the change of behavior depending on the situation (C28). Finally, regarding age, the difference lies in the use of illicit drugs to allay the anguish (C31).

The results indicate that female students more frequently present behaviors focused on planning and the action plan, which is an important attitude to face adverse situations. The concerns hover around the higher level of licit drug use by female respondents, as it can compromise this group of respondents' physical and mental health, and these behaviors can be transferred in the long term to the professional job market (Meriac, 2012). The consequences of these coping strategies are reflected in these female respondents' quality of life and in the functioning of the socio-academic environment.

It is also noteworthy that public college students plan actions and adapt their behavior more intensely than private college students. This coping process related to conversion and additivity can be aligned to the students' level of satisfaction with the experiences in the socio-academic environment. In this condition, the students tend to practice the re-evaluation of problems and the planning of possible solutions to solve the stressful and unpleasant situations (Hirsch et al., 2015). On the other hand, this behavior is also important, because it promotes the students' adaptability towards uncertain environments, surrounded by vulnerability, pressure and excessive goal compliance, and there are insights that need to be fostered also in private college students as well.

Finally, the students' use of illicit drugs raises concerns about their effects on the lives of these individuals. It is recommended that the students' monitor and share experiences, either through student groups or by policies the educational institution promotes to discuss the adoption of compensation behaviors (Costa & Leal, 2006) that are beneficial to the individuals' physical and mental health in the short and long term.

Some of the Accountancy students in this research employ the use of aggressiveness, behavior change and the use of illicit drugs in combination under conditions of stress and high emotional burden. These forms of coping are elements that are harmful to their development and that sometimes lead to counterproductive behaviors in the academic environment. Thus, with regard to conversion and additivity, it serves as an alert about the mental health status of Accountancy students because "the way the person deals with stressful situations plays an important role in the relationship between stress and health-disease process" (Carlotto, Câmara & Kauffmann, 2009, p.170).

The scenario regarding the teaching and learning process that is being offered to the students sometimes culminates in the choice of coping strategies that harm the students' health and consequently their performance in professional and personal terms. These results are linked to the conditions the student has experienced in the academic environment. These conditions are characterized as stressful, lacking a high emotional load, and imposing on the individual the adoption of compensatory behaviors (Carlotto, Teixeira & Dias, 2015; Antoniazzi, Dell'aglio & Bandeira, 1998; Hammer, Grigsby & Woods, 1998). In these conditions, the compensations are negative for the professional and interpersonal development, with regard to overcoming vulnerabilities and the problems that permeate higher education.

The students' professional and interpersonal development is related to the coping strategies adopted in the academic environment (Carlotto, Teixeira & Dias, 2015). Thus, their academic career is also driven by their involvement with the educational institution. The teaching-learning process the student needs to submit to has to culminate in coping choices that can contribute to overcoming challenges and solving problems, enabling benefits in career building, in the awareness raising of the challenges present in the course and in the management of internal and external demands that cause stressful and oppressive events.

5. Final Considerations

The study argues that the coping strategies are associated as, by developing this behavioral characteristic towards situations of stress and contempt, this action can cause more problems, which will add to those already manifested, thus leading the individual to a dynamic in this phenomenon. Thus, the strategies Accountancy students adopt which reflect their perceptions in this investigation represent behaviors they adopt to face problems experienced in the socio-academic environment.

When the students decide to face the problem head on through their control and social support, this results in desirable consequences. In this scenario, it is illustrated that, by adopting effective coping strategies, both the level of stress and the situations that cause discomfort in the socio-academic environment are reduced, a fact that represents an advantage, as it allows the students to focus on the construction of their academic and professional trajectory. It is noteworthy that the respondents who identify with the female gender showed more intense problem coping in terms of the level of control, in the analysis of stressful and unpleasant situations to better understand them and not to panic with regard to control. The students from the public HEI face the problems more intensely. Regarding social support, public college students resort to this coping strategy more intensely than private college students. In turn, the Accountancy students' age group will lead them to adopt a strategy of approach with people who have already gone through a similar situation in a different way.

On the other hand, coping strategies based on withdrawal, distraction, refusal, conversion and additivity are undesirable, as they encourage behaviors in the Accountancy students that contribute to avoid situations that cause stress and contribute to the development of negative emotional experiences. It is evident that the high level of adoption of these coping strategies, embodied in not solving the problem actively, signals that students may not be developing adaptation skills to the university space. When considering this scenario in terms of intergroup comparison, the research illustrates that the distraction strategy concerning changed feelings when the difficulties emerge are more intense among the female participants. As for belonging to a public or private HEI, the results show that public college students adopt strategies of denial of the stressful and unpleasant situation more frequently. With regard to the withdrawal strategies, the research indicates that male students presented a higher level of withdrawal in relation to emotions when compared to female students. Also in relation to the HEI, public college students present a more intense feeling of guilt about the problems faced.

Finally, regarding conversion and additivity strategies, the results show that female participants choose to face the problems based on the elaboration of action plans and try to apply them, and also based on the more intense use of licit drugs than male participants. With regard to this strategy, it is also illustrated that public college students plan actions and adapt their behavior more intensely than private college students. The agreement on the use of illicit drugs is significant when analyzed based on the respondents' age group. The younger the students, the more intensely this coping strategy is adopted.

The costs deriving from stressful and uncomfortable situations individuals experience in organizations, university, and vocational training environments can be mitigated through research that contributes to the understanding of the measures individuals take to create an environment of well-being (Latack & Havlovic, 1992; Vasconcellos, 2017). Acknowledging that universities, whether public or private, also suffer from high levels of stress, they should try to discuss aspects related to the teaching structure and performance assessment. The sooner the educational institutions try to change this scenario, the faster they can contribute to the wellbeing of the socio-academic community.

The changing nature of society, people, and teaching-learning processes intensifies changes in higher education and the surrounding structures. Thus, the results highlighted in this research in terms of conducting problem situations, stress and emotional exhaustion represent the students' experiences with higher education. For now, the situations experienced in higher education and the constant need to assume more and more responsibilities indicate that coping strategies are adopted according to each situation experienced. In that sense, a strategy may be satisfactory in one situation but not in another. And this volatility of situations effectively contributes to the students' behavioral development and academic performance process, which will be transferred to the professional market.

This article highlighted that coping strategies are associated and drive student behavior in higher education. Basically, it is emphasized that the university needs to integrate this process, as it is closely linked to academic development and the experiences the students will trigger while in higher education. This research represents an alert, as the conduction of problem situations, stress and emotional exhaustion affect college students' behavior and mental health. Through these results, we hope to contribute to the promotion of the theme not only in Accountancy courses but also the other courses, as higher education presents itself as a true arena of the game, in which all actors have responsibilities.

As a suggestion for future research, the research sample should be expanded, an action that can provide even more reliable results, considering that the findings identified in this research are strongly concentrated in students enrolled in the first and second year of undergraduate education. Furthermore, a broader discussion about the coping strategies within a context of workers who study and students who work (Vargas & Paula, 2013) is due in view of the results identified. Another issue is about the metric used, as an association is perceived between behavioral elements. Acknowledging this diagnostic nature of this study, attention should be paid to the relational aspects. Thus, future research can discuss the reflexes of the coping strategies in the higher education structure the students have contact with, which may illustrate the need for policies and attention to their wellbeing in different parameters.

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Do good fundamentals generate alpha?

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Abstract

Objective: To verify abnormal risk-adjusted returns in Brazilian stock portfolios formed according to the F-Score that indicates the presence of good fundamentals.

Method: The sample has an average of 146 companies per year, includes the period of adoption of the International Financial Reporting Standards (IFRS) from July 2008 to June 2018 and uses equally weighted portfolios formed at the end of June of each year with information from the previous year.

Results: The high F-Score portfolio showed greater average returns, lower beta, and a positive and significant alpha that disappeared in the sub-period initiating after the full adoption of IFRS. Significant coefficients for the small capitalization risk premium and egalitarian weighting suggest that large companies do not dominate its performance. High and low F-Score portfolios cannot be characterized as value stocks. The low F-Score portfolio displayed a negative and significant coefficient for the moment factor, suggesting persistence of negative returns.

Contributions: Portfolios with high F-Score may have less chance of catastrophic returns. The technique can be employed by less sophisticated investors to build defensive portfolios of companies with good fundamentals.

Keywords: F-Score, fundamental analysis, alpha, portfolio selection.

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1. Introduction

Fundamental analysis uses accounting, financial, and economic variables, among other things, to estimate the intrinsic value of a company or stock. Graham (2007) claims that fundamental analysis is an important criterion to build stock portfolios because the market is inefficient. The seminal articles of Fama and French (1992, 1993) are an example of the use of fundamentalist metrics to price market inefficiencies relative to the Capital Asset Pricing Model (CAPM) because they account for the size and value anomalies. The fundamental indexation proposed by Arnott, Hsu and Moore (2005) is another example of portfolios formed according to fundamental metrics and analysis.

Piotroski (2000) proposed the F-Score as an objective measure that congregates several fundamental analysis metrics that is designed so that the higher this score, the higher the quality of a company's fundamentals. The F-Score metric may be relevant to investors in general because of its simple implementation. Those willing to create stock portfolios by themselves may not be capable to sift through the myriad of corporate information available. Thus, they may resort to a subjective evaluation of the available analysis offered by providers such as investment platforms and financial institutions or to use a few selected metrics. The F-Score considers a few selected fundamental metrics jointly that are easy to find and simple to compute and may serve individual investors (Carneiro and Leal, 2017; Piotroski, 2000).

The objective of this article is to assess if the merit of the F-Score to select stock portfolios in Brazil. The Brazilian stock market has gained more attention from investors in general, particularly from individual investors, recently. The Ibovespa index has reached successive historic highs while the base interest rate is at a current historical low at the time of the writing of this article. Many analysts include stocks as an alternative to attain higher investment gains in this new environment (Daltro and Leal, 2019). Thus, this new investment setting justifies looking at fundamental stock selection methods, such as the F-Score. This article builds portfolios of Brazilian stocks using the F-Score and evaluates whether they are capable of generating positive and significant alphas after their historical returns have been adjusted to the CAPM, Fama and French (1993) and Carhart (1997) risk factor models. Moreover, the F-Score could be a stock selection criterion for products such as an exchange-traded fund (ETF).

Naturally, most individual investors will not be capable to compute alphas, even though researchers should properly ascertain if portfolios based on the F-Score attain abnormal returns in an asset pricing setting to validate the F-Score before recommending it to investors. Thus, it is important to verify if any significant excess returns of portfolios formed according to the fundamentals, such as the F-Score in the case of this article, disappear after adjusting for well-known risk factors, some of them based on stock market anomalies. For example, Fama and French (1993) contemplate the size and value anomalies and Carhart (1997) adds the momentum anomaly to their asset pricing models. An anomaly is a characteristic that is associated with significant and regular excess returns that an asset-pricing model, such as the CAPM, does not explain. What is anomalous relative to one model may be consistent with the predictions of other models. Fama and French (2012, 1992) report higher returns for portfolios of smaller companies that the CAPM does not explain, which led to their size risk premium factor. Value stocks are considered undervalued because they trade at a low price relative to their fundamentals. Fama and French (2012, 1992) also acknowledged a value stock premium in the US and in the world that the CAPM did not explain. These two factors plus the CAPM market risk premium factor constitute their three-factor model (Fama and French, 1993). The momentum anomaly is the persistence of past positive returns and Carhart (1997) added it as a fourth risk factor to the Fama and French (1993) model when analyzing US mutual funds. Moreover, maybe the F-Score could be an anomaly if the F-Score consistently attains positive alphas after adjusting for these risk factors.

The analysis herein employs monthly returns over the ten-year period beginning in July 2008 and ending in June 2018. The formation of the various portfolios occurs at the end of June of each year to ensure that the accounting information was disclosed prior to portfolio building in order to avoid the look-ahead bias, following Fama and French (1992, 1993) and Machado and Medeiros (2011), for example, among several Brazilian authors. The look-ahead bias occurs when a researcher uses information that was not available to investors on a time period in the past. For example, if companies publicize their end of the year information by the end of April of the following year, then, if the investor formed her portfolios in April, companies that did not publicize the information in April would not be considered. However, in the future, the information, publicized late, would be available for a researcher forming portfolios for a historical analysis, and that researcher would have a biased sample. Thus, June is a safety margin to eliminate the chance of the sample being biased in this way (Fama and French, 1992, p. 429).

Piotroski (2000) and Galdi and Lima (2016), for the US and Brazil, respectively, applied the F-Score to value stocks because their low relative market value could be due to poor fundamentals. Hyde (2018), however, claims that investors would be more likely to employ the F-Score combined with another criterion, which opens the possibility of considering all kinds of stocks. The analysis in this article differentiates itself from these previous articles because it uses the most comprehensive Brazilian sample that could be obtained, rather than focusing solely on value stocks, which would further reduce the sample because there may be few value stocks to consider. Furthermore, the value stock effect in Brazil has not been consistently present in the last 25 years, which casts doubts about considering the F-Score as an explanatory metric exclusively for value stocks (Rayes, Araújo and Barbedo, 2012). Finally, adjusting the Fama and French (1993) and Carhart (1997) models allows assessing whether F-Score portfolios have characteristics related to the size, value, and momentum risk factors, and, if so, indicates that the F-Score may only be a criterion that leads to the formation of portfolios that have one or more of these characteristics as dominant.

This article contributes to the Brazilian literature on the potential of fundamental analysis, particularly for less sophisticated investors who cannot devote much time or resources to this activity or do not have in-depth knowledge of the process. Individuals, in particular the least sophisticate ones, would be the kind of investor who could most benefit from the potential, if any, of the F-Score to form portfolios of companies with good fundamentals as they would look for easily understood and obtainable indicators and would use them to build and weight their portfolios (Carneiro and Leal, 2017). In addition, the results may indicate that the F-Score is a reasonable criterion for the building of fundamentalist index funds, sometimes called smart beta funds, with Brazilian stocks. The Brazilian literature on the value stock premium is not unanimous in acknowledging its existence. Medeiros and Bressan (2015) and Machado and Medeiros (2014), for example, find significance for the value premium coefficient while Rayes et al. (2012) report antagonistic results. Thus, the ensuing analysis expands the evidence on the use of the F-Score because it applies it to a broad stock sample of a major emerging market. Finally, the study differentiates itself from previous Brazilian studies also because it uses a sample period in which the gradual introduction of the International Financial Reporting Standards (IFRS) occurred and is the first to consider the F-Score in a sub-period in which these standards have been fully adopted by all listed companies, relying on a sample of companies under a homogeneous accounting standard to obtain fundamentalist metrics.

The results indicated that only the portfolio with high F-Score companies showed positive and significant alphas as well as lower betas than the portfolio with low F-Score companies. This significance of alphas disappeared in the sub-period initiated in July 2011 when all companies in the sample had already adopted the IFRS. Market risk (beta) was higher for companies with low F-Score. Smaller companies with high F-Score had, on average, higher returns. There was no indication that companies with higher or lower F-Score were value or growth stocks, suggesting that this feature did not distinguish companies according to their F-Score. Finally, stocks with lower F-Score showed evidence of persistent negative returns. Overall, the evidence is consistent with the importance of the quality of corporate fundamentals for less exposure to market risk, particularly for midsize and small companies, and also for avoiding greater destruction of portfolio value potential. The F-Score is a simple and objective method that may help less sophisticated Brazilian investors to form a lower market risk portfolio that does not suffer catastrophic returns.

2. F-Score literature review

This section reviews the literature about the F-Score and details how it is obtained. Before proceeding, is worth noting that this article will use the Fama and French (1993) and Carhart (1997) asset-pricing models. Some Brazilian articles that investigated these models will be mentioned in the results section. They were not included in this literature review section for brevity because reviewing their evidence in detail is beyond the scope of this article. The reader could refer to Rayes et al. (2012) and Machado and Medeiros (2011), for instance, for a review of this literature.

Abarbanell and Bushee (1998) found significant abnormal returns after forming portfolios based on a set of fundamental analysis variables and that much of these returns are generated close to earnings announcements. Arnott et al. (2005) proposed building portfolios weighted by fundamental indicators and claim that their method leads to higher returns and lower volatility than using market value for weighting. Yet, Asness et al. (2015) argued that this fundamental indexation is nothing more than a value stocks strategy.

Combining fundamentalist metrics with portfolios that reflect size or value anomalies may improve the return-to-risk ratio. Asness et al. (2018) add the Quality Minus Junk (QMJ) factor resulting in a significant and more stable premium over time, which is not concentrated in very small companies, robust to size measures that are not based on price, and not captured by an illiquidity premium. Graham (2007) suggests that investors build diversified portfolios with stocks presenting low multiples and debt ratios, a history of dividend payout and earnings consistency, which would be a combination of good quality fundamentals and value stocks.

Piotroski (2000) also combined fundamental analysis with a value stocks strategy. He used the F-Score metric that combines the scores of nine items derived from accounting and financial metrics to measure the strength of corporate fundamentals. The performance of a portfolio of value stocks with good fundamentals was superior to a portfolio of value stocks in his study. The author also reported evidence that the market takes time to incorporate financial information as an evidence of inefficiency.

Piotroski (2000) argues that accounting and financial metrics that reflect changes in some fundamental dimensions are useful to predict stock performance. Table 1 shows the F-Score method proposed by the author, which consists of a zero or 1 score for each of nine statements related to fundamental metrics. The value 1 corresponds to a positive fundamentalist effect and the F-Score score ranges from 0 to 9. The statements are organized into three dimensions: profitability (1 to 4), operational efficiency (5 and 6), and leverage and financial liquidity (7 to 9). High F-Score (HF) companies have an F-Score of 8 or 9 and show greater improvement in their fundamental whereas Low F-Score (LF) companies are those with an F-Score of 0 or 1. Piotroski (2000) employed equal weighting and rebalanced his portfolios at the beginning of May of each year using the information from the balance sheet of the end of the previous year.

Table 1
F-Score scoring criteria

Item	Statement	If true
1	$ROA_t > 0$	+1
2	$CFO/Asset_t > 0$	+1
3	$ROA_t - ROA_{t-1} > 0$	+1
4	$CFO/Asset_t > ROA_t$	+1
5	Gross $margin_t$ - gross $margin_{t-1} > 0$	+1
6	Asset $turnover_t$ - Asset $turnover_{t-1} > 0$	+1
7	Current $ratio_t$ - current $ratio_{t-1} > 0$	+1
8	Debt $ratio_t$ - debt $ratio_{t-1} > 0$	+1
9	The company did not do a public stock offer	+1

Note.: The value assigned to each item will be 1 if the affirmative is true and 0 otherwise. The F-Score is the sum of the score of the nine items and ranges from 0 to 9. Year *t* is the year prior to portfolio formation. The portfolios are formed at the end of June of each year. ROA_t is the return on assets defined as net income before extraordinary items at the end of year *t-1* over assets at the beginning of year *t-1*. $CFO/Asset_t$ is the operating cash flow of year *t-1* over assets at the beginning of year *t-1*. Gross margin equals the difference between net revenue and cost of goods sold over sales. Asset turnover is the net revenue from year *t* over the average of total assets at the beginning and end of year *t*. The current ratio is current assets divided by current liabilities in year *t*. Debt is long-term debt in year *t*, which includes the portion of long-term debt classified as current liabilities, over the average of total assets at the beginning and end of year *t*.

Statements 1 and 2 in Table 1 refer to ROA_t and $CFO/Assets_t$, which are measures of profitability, and contribute to the company's fundamentals when they are positive. Statement 3 refers to the year-on-year increase in ROA, which, if any, has a positive impact on the company. Statement 4 deals with the difference between profitability based on the cash flow and profits that indicates that there were no relevant accruals when positive, which may have a negative impact on the future corporate profitability and stock return (Piotroski, 2000).

Statements 5 and 6 are in the operational efficiency dimension of the F-Score. An increase in gross margin from one year to the next may indicate an improvement in costs or an increase in the company's product prices. An improvement in asset turnover may indicate a more efficient operation or an increase in revenue.

The leverage and financial liquidity dimension has three statements. The increase in the company's current liquidity ratio, a decrease in its debt level and the absence of public issuance of shares would be associated with an improvement in the company's fundamentals. Piotroski (2000) argues that a firm in financial distress may start to raise external financing because it is unable to generate funds internally and, furthermore, an increase in long-term debt may diminish its financial flexibility in the future. Moreover, the author also suggests that issuing shares when the share price is undervalued, as is the case with value stocks, highlights a company's poor financial condition.

The practicality and simplicity of the F-Score and its appeal to many investors who believe that companies with higher quality fundamentals should outperform over the long term have generated interest in the method outside the US. Hyde (2014) applied it to a set of emerging market stocks in the MSCI Emerging Markets Index between January 2000 (667 stocks) and December 2011 (805 stocks). The author found a positive premium for his high F-Score portfolio, except for Brazil, whereas the portfolio of Brazilian stocks with low F-Score performs better than that with high F-Score. The author neither divulges the number of Brazilian stocks in the sample nor explores the reasons for the negative premium in Brazil. Hyde (2018) applied the F-Score to the Australian market and did not find a positive and significant alpha, even though there was a positive excess return relative to a market index.

There is divergence in the Brazilian results. Galdi and Lopes (2013) find favorable evidence for the use of the F-Score in the Brazilian market between 1994 and 2004, in contrast to Hyde (2014), but argue that these returns disappear when controlled for arbitrage limits, as they are mainly determined by small companies that do not allow for arbitrage and also have low liquidity or are heavily indebted. Galdi and Lima (2016) and Werneck, Nossa, Lopes and Teixeira (2010) also applied the Piotroski (2000) method to the Brazilian market for the periods 2001 to 2011 and 1995 to 2004, respectively. Both found that fundamental analysis contributes positively to future returns in a period prior to the full adoption of IFRS, even though the findings of Werneck et al. (2010) favor the Ohlson's model.

Other Brazilian articles related market returns to fundamentals but did not employ the F-Score. Costa Jr., Meurer and Cupertino (2007) report that there is weak evidence that accounting returns anticipate market returns. Rostagno, Soares and Soares (2008) outline the fundamental profile of the monthly winning and losing portfolios of exchange-traded companies from 1995 to 2002. Malta and Camargos (2016) identify eight variables from fundamental analysis that are relevant in predicting stock returns, several of them analogous to those considered in Piotroski (2000). Roquete, Leal and Campani (2018) find evidence that the fundamental indexation strategy, as proposed by Arnott et al. (2005), can do better in times of market lows and resemble a value stock investment strategy.

There were positive and significant alphas in some cases and risk factor models could not fully explain the performance of equally weighted portfolios formed according to the F-Score in some stock markets (Hyde, 2018). Hyde (2018), however, found that alphas generally lost their significance when portfolios were weighted by market value in Australia, suggesting a size effect on the equally weighted F-Score portfolios, which is not surprising. Piotroski (2000), for example, finds evidence that the benefits of financial statement analysis and the F-Score are concentrated in small and medium sized enterprises with little or no analyst coverage. On the other hand, Hyde (2014) and Hyde (2018) find no evidence based on this hypothesis for the Australian and several emerging markets. Yet, there is some convergence regarding the hypothesis that the market takes time to incorporate financial information, which is a key aspect of the F-Score strategy (Piotroski, 2000; Hyde, 2014) and fundamental analysis in general (Graham, 2007).

3. Methodology

3.1 Sample

The objective of this investigation is to verify if the F-Score of Piotroski (2000) applied in the construction of Brazilian stock portfolios is capable of generating abnormal returns after the Carhart (1997) four-factor model adjustment. The initial sample is the set of companies with shares listed in the Brazilian stock exchange, called Brazil Bolsa Balcão (B3), between June 2008 and June 2018. The IFRS was phased in during this period until all listed companies were required to adopt it by 2011, rendering possible to guarantee a uniform accounting standard for the F-Score variables. Tests were performed for the full sample period and also for the sub-period beginning in 2011. Portfolios were formed in June of each year to reduce the possibility of the look-ahead bias and, ensuring that the accounting data had been publicized prior to their formation. The source of the data was Bloomberg.

The initial sample consisted of 3427 company-years, an average of 343 companies per year in the ten years of the sample, ranging between 172 and 427. Financial firms have been excluded because their high leverage probably does not have the same meaning as in non-financial firms, in which high leverage may mean financial hardship. This resulted in the exclusion of 502 company-years from the sample. Subsequently, companies that did not have a market value at the end of year *t-1* and on the date of portfolio formation in year *t* were excluded, as this variable is necessary to calculate the parameters required for portfolio formation, resulting in the deletion of 878 companies-year. Companies with negative or zero book equity at the end of year *t-1* were also excluded, according to the methodology of Fama and French (1992), leading to the exclusion of 199 company-years.

The next filter excluded 221 company-years that did not have the necessary data to calculate the F-Score. Finally, 171 company-years that did not have consecutive monthly quotations in the 12 months prior to and 12 months after the portfolio formation date were also excluded, which reduces the effects of illiquidity and enables portfolio rebalancing (Machado and Medeiros, 2014). In case a company has more than one type of stock, the most liquid one was used. The average number of companies analyzed per year was 146 after this filtering (ranging between 74 and 180), which is close to 149 per year for Machado and Medeiros (2014).

3.2 F-Score calculation

This section reports on the adaptations made to the Piotroski (2000) methodology to adjust it to the reality of the Brazilian market. Each scored statement in the F-Score received a value of 0 or 1 and is identical to what was presented in Table 1 that depicts the author's original procedure. The first difference from the original method is that the portfolios were formed at the end of June of each year, to be compatible with the factor calculation method of the Fama and French (1993) and Carhart (1997) models, while Piotroski (2000) formed them in early May. The second difference is that this article did not constrain the sample only to value stocks, such as in Piotroski (2000), because the Brazilian sample is much smaller than the US one and also because the existence of a value premium in Brazil is controversial according to some authors (Medeiros and Bressan, 2015; Machado and Medeiros, 2014; Rayes et al.; 2012). The third and last difference was in the way companies were classified as High (HF) and Low F-Score (LF). In this article the scores corresponding to High (HF) and Low F-Score are different. Piotroski (2000) classified as HF the companies with a score greater than or equal to 8 whereas this article classified companies with F-Score greater than or equal to 7 as HF. Companies classified as LF had an F-Score less than or equal to 4 in this article while Piotroski (2000) classified as LF those scoring less than or equal to 1. The other companies were classified as Medium F-Score (MF).

This third modification was introduced due to the smaller size of the Brazilian sample that would lead to very few companies classified as High and Low F-Score if the original Piotroski (2000) limit scores had been employed. The LF portfolio would have only one company per year in 7 out of 10 years and HF less than 10 companies in 5 out of 10 years if the classification proposed by Piotroski (2000) was applied to the Brazilian sample in this article. On average, 26%, 44% and 30% of the sample was classified each year as HF, MF and LF, respectively. These proportions were very close to the 30%, 40% and 30% proportions used in the portfolios formed to estimate the risk factors of the Fama and French (1993) and Carhart (1997) models described below. Detailed counts of the number of companies for each F-Score item and by year for each method are available from the authors.

3.3 Risk-adjustment models and hypotheses

Regressions with monthly returns for the HF and LF portfolios were estimated for the entire sample period (July 2008 to June 2018) and a sub-period from the full adoption of IFRS (July 2011 to June 2018) according to Equations 1, 2 and 3 for the CAPM, Fama and French (1993) three-factor model and Carhart (1997) four-factor model, respectively. Regressions were estimated using the ordinary least squares method with robust standard errors for heteroscedasticity to verify if the estimated alphas of the equally weighted HF and LF portfolios were positive and significant, as well as that for the series of monthly differences between the HF and LF (HMLF) portfolios, as in Hyde (2018, 2014).

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i \times (R_{m,t} - R_{f,t}) + \varepsilon_{i,t} \quad \text{Eq. 1}$$

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i \times (R_{m,t} - R_{f,t}) + s_i \times SMB_t + h_i \times HML_t + \varepsilon_{i,} \quad \text{Eq. 2}$$

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i \times (R_{m,t} - R_{f,t}) + s_i \times SMB_t + h_i \times HML_t + w_i \times WML_t + \varepsilon_{i,t} \quad \text{Eq. 3}$$

$R_{i,t}$, $R_{f,t}$ and $R_{m,t}$ are the month t returns of portfolio i, the risk free rate, and the Ibovespa stock index, respectively, with $\varepsilon_{i,t}$ being the corresponding error term in Equations 1, 2, and 3. α_i is the estimated intercept of the regression that denotes the excess risk-adjusted return of portfolio i.

The first risk factor in Equations 1, 2 and 3 is the market risk premium (MRP), which is the difference between the observed return for the Ibovespa index ($R_{m,t}$) and the Interbank Certificate of Deposit (CDI) rate for each month ($R_{f,t}$), which stands as the risk-free rate. The Ibovespa index represents the market portfolio because it is the older and most followed Brazilian index, has a 0.99 correlation with the Brazil 100 Index (IBrX 100), which is broader and would be an alternative, is used in many Brazilian studies (Roquete et al., 2018). Thus, using any of these two indices would probably yield nearly the same results. An equally weighted portfolio of the stocks used to compute the four risk factors had a correlation of 0.83 with the Ibovespa and 0.82 with the IBrX 100. Thus, a value-weighted portfolio of these stocks would behave very similarly to these market indices.

The CDI rate is a repo rate and represents the risk-free rate because it is the most widely used benchmark, included as a comparative in the factsheets of almost all types of funds, stands as an opportunity cost in the Brazilian market, and behaves very closely to the federal government treasury bill rate, with a correlation of 0.99, even though it is not directly subjected to the monetary policy base treasury rate (Roquete et al., 2018). β_i is the coefficient of the MRP factor for portfolio i.

The sample stocks were ordered according to their market value in June of year *t*. The ordered sample was then divided into three groups that were named Big (30% of the sampled companies with the highest market value), Medium (next 40%) and Small (remaining 30% of the sampled companies with the lowest market value). SMB_t is the second risk factor, present in Equations 2 and 3, and is the difference between the equally weighted portfolios comprised of the Small and Big stocks. s_i is the coefficient of the SMB risk factor. This procedure is an adaptation of the one in Fama and French (1993) and analogous to that of several Brazilian authors (Roquete et al., 2018; Mussa et al., 2012; Rayes et al., 2012; Machado and Medeiros, 2011, for example). The calculation of the two remaining risk factors described below is similar.

The stocks in the sample were also ordered in June of year *t* according to the book-to-market ratio (BTM), which is the ratio of book equity to the market value of the company in December of year *t-1*. The sample was then divided into three groups named High (30% of the sampled companies with the highest BTM), which represents value stocks, Medium (next 40%) and Low (remaining 30% of the sampled companies with the lowest BTM), which represents growth stocks. HML_t is the third risk factor present in Equations 2 and 3 and is the difference between the equally weighted portfolios of the High and Low shares and h_i is its coefficient.

Finally, a new ordering of the sample was made according to the accumulated return over the last 12 months ending in June of year *t* excluding this month to avoid the bid-ask bounce, thus considering an 11-month window. The sampled stocks were rated Winners (the 30% with the highest cumulative returns in the 11-month window), Neutral (next 40%) and Losers (remaining 30% with the worst cumulative returns in the 11-month window). WML_t is the fourth risk factor, present only in Equation 3, and is the difference between the monthly returns of the equally weighted portfolio of the Winners and Losers portfolios and w_i is its coefficient.

The hypotheses derived from the literature review and tested in this article are that (H1) the HF portfolio posts higher average or median returns than the LF portfolio, even though (H2) HF and LF alphas are not significant after the adjustment of the Carhart (1997) model. The evidence in Hyde (2014) and Piotroski (2000), for the F-Score, and in Abarbanell and Bushee (1998) and Arnott et al. (2005), for fundamentals in general, among others, supports H1. The notion that a simple scoring method such as the F-Score offers positive and significant alphas consistently even after adjusting for well-known risk factors would indicate the inadequacy of the Carhart (1997) asset pricing model, and the evidence in Hyde (2018), for the F-Score, suggests that this does not happen and supports H2.

4. Results

4.1 Risk factors discussion

Table 2 shows descriptive statistics for the key portfolios and risk factors in the 120-month sample period from July 2008 to June 2018 as well as in the 84-month sample of the sub-period initiating in 2011. The MRP did not show an average significantly different from zero over the period but reached the highest volatility among the risk factors considered. This result indicates a period in which the stock market failed to achieve a cumulative return higher than the CDI rate, which is consistent with what Daltro and Leal (2019) report.

Table 2

Descriptive statistics of the returns of selected portfolios

Portfolio	Mean	Median	SD	M/SD	Min	Max
Panel A: July 2008 to June 2018 (120 months)						
SMB	-0.55	-1.16**	4.76	-0.11	-10.86	16.25
HML	-0.01	-1.00	4.48	0.00	-8.27	20.15
WML	1.14**	2.20**	5.38	0.21	-21.53	11.02
MRP	-0.52	-0.76	6.59	-0.08	-25.60	18.60
HF	1.03**	1.43**	5.52	0.19	-24.71	20.74
MF	0.85	0.70	6.79	0.12	-24.93	34.24
LF	0.35	0.37	8.47	0.04	-32.73	37.52
HMLF	0.68*	1.04**	4.27	0.16	-16.78	14.64
Panel B: July 2011 to June 2018 (84 months)						
SMB	-0.85*	-1.16**	4.76	-0.11	-8.95	16.25
HML	-0.02	-0.99	4.67	0.00	-8.27	20.15
WML	1.58**	2.67**	5.29	0.30	-21.53	11.02
MRP	-0.45	-0.98	6.18	-0.07	-13.75	18.60
HF	0.70	0.97*	4.32	0.16	-9.42	11.58
MF	0.63	0.35	5.48	0.12	-9.76	18.97
LF	0.07	-0.05	6.34	0.01	-13.64	22.58
HMLF	0.63*	1.05**	3.24	0.19	-11.18	8.42

Note.: All figures are percentages. The second period corresponds to that in which the convergence to international accounting standards had already been fully realized for Brazilian publicly traded companies. SMB (small minus big) is the monthly risk premium for small company stocks. HML (high minus low) is the risk premium for stocks with the highest book equity over their market value. WML (winners minus losers) is the risk premium for stocks with the highest cumulative returns in the previous 12 months. MRP is the market risk premium calculated as the difference between the Ibovespa return and the CDI rate for each month. HF is the portfolio of the companies with F-Score greater or equal to 7, LF is the portfolio of companies with F-Score less or equal to 4, and MF contains the other companies. HMLF is the difference between HF and LF portfolio returns in each month. Mean is the arithmetic average of monthly returns. Median is the median of monthly returns. Min and Max are the minimum and maximum monthly returns. SD is the standard deviation of monthly returns. M/SD is the relationship between the arithmetic mean and standard deviation of monthly returns. The Shapiro-Wilk normality test, not shown, rejected normality of all series depicted in the table. ** and * denote that the mean is significantly different from zero according to a two-tailed t-test as well as that the median is significantly different from zero according to a Wilcoxon signed rank test at the 5% and 10% levels, respectively. The mean number of companies per year in HF, MF, and LF is 36.0, 60.1, and 41.2, respectively.

The average and median of the SMB factor are negative and reveal that larger companies performed better in the sample period, consistently with the Brazilian evidence of Cordeiro and Machado (2013), Mussa, Famá and Santos (2012), Machado and Medeiros (2011), among others, while contradicting the seminal US evidence in Fama and French (1993) for a much longer period. The absence of statistical significance for the mean of SMB confirms Machado, Faff and Silva (2017), Cordeiro and Machado (2013), Rayes et al. (2012) and Machado and Medeiros (2011) in Brazil and Alquist, Israel and Moskowitz (2018), which revealed negative statistical significance for other countries. It is also possible that the liquidity filters applied here excluded the stocks of smaller companies whose returns are naturally crucial to the size premium. In addition, Alquist et al. (2018) and Asness et al. (2018) claim that the size premium is not robust or statistically significant and is due to illiquidity, very small companies, the January effect or data mining.

The average HML factor in Panel A of Table 2 is basically zero over the period and corresponds to the results of several Brazilian authors suggesting some persistence of null or even negative premiums for value stocks in Brazil (Medeiros and Bressan, 2015; Machado and Medeiros, 2014; Cordeiro and Machado, 2013; Rayes et al., 2012; Machado and Medeiros, 2011). However, this is contrary to the seminal evidence in Fama and French (1993) and the Brazilian evidence in Mussa et al. (2011).

The average WML was positive and significant and the highest among the four factors of Carhart (1997), indicating persistence of positive returns among Brazilian companies, which corresponds to the evidence reported by several Brazilian (Machado et al., 2017; Machado and Medeiros, 2014; Machado and Medeiros, 2011) and international authors (Carhart, 1997), but contradicts Mussa et al. (2012), who did not find significance for the momentum risk factor.

Even though these results are consistent with various conjectures presented in the literature, the 10-year period analyzed is relatively short for substantive interpretations of each risk factor and this is not the purpose of this article anyway. Moreover, Welch and Goyal (2008) state that most models that attempt to predict returns do poorly out of the sample and are unstable over time, which is corroborated by Bahrami, Shamsuddin and Uylangco (2018) in emerging markets. Consequently, the results to be presented should be interpreted taking these warnings about the risk factors into consideration.

4.2 Descriptive statistics for the F-Score

Panel A of Table 2 shows that HF had a higher mean return and a lower standard deviation than MF and LF. The HMLF portfolio, which is the difference between the returns of HF and LF, offered a positive and marginally significant return, which is lower than HF. The standard deviation of the HF portfolio is lower than that of MF and LF, but is higher than that of HMLF.

Additional descriptive statistics in Panel B of Table 2 depict the period between July 2011 and June 2018 when the international convergence of accounting standards had already been fully accomplished. Overall, the results are consistent with those for the period beginning in July 2008, except for the loss of significance of the average monthly return on the HF portfolio, but not of its median return. The smaller values of the standard deviations of the HF, MF, LF and HMLF portfolios are also noticeable. Apparently, convergence to the international accounting standard did not substantially affect these initial results.

Portfolios of companies with good accounting fundamentals may offer higher returns with lower volatility, subject to the limitations of the length of the sample period. Thus, the evidence is consistent with H1 that average or median HF returns would be higher than the LF portfolio returns, preliminarily supporting the notion that a portfolio of companies with better fundamentals may outperform portfolios of companies with fundamentals that are not as good.

4.3 F-Score portfolios, risk adjustment and alphas

Panel A of Table 3 shows the coefficients of asset pricing models adjusted on the returns of the HF and LF equally weighted portfolios based on the F-Score. Only the HF portfolio exhibited a positive and significant alpha for the three models, consistently with Hyde (2018) for Australia. Moreover, it is worth noting that the alpha significance for the HF portfolio obtained with the CAPM remains even after the additional risk factors of the other models are used. This would probably suggest that the HF portfolio possibly has merit, but the results in Panel B of Table 3, in the IFRS sub-period, show non-significant alphas for HF in all models. Thus, the results in Panel A are probably simply period related and cannot be generalized. The beta coefficient was significant in all models as expected because the MRP continues to be the most important risk factor for portfolios of Brazilian stocks (Medeiros and Bressan, 2015; Machado and Medeiros, 2011). The LF portfolio had a higher beta than HF, also as expected, because the companies in this portfolio have lower quality fundamentals by construction, according to the F-Score, and thus it is not surprising that they present a higher systematic risk. These results are consistent with those of Asness, Frazzini and Pedersen (2019), who show that higher quality companies have lower beta.

Table 3
F-Score portfolios, risk adjustment and alphas

Model	Portfolio	α	β	s	H	w	R^2 aj.
Panel A: July 2008 to June 2018 (120 months)							
CAPM	HF	0.56*	0.70**	–	–	–	0.68
	LF	0.06	1.04**	–	–	–	0.65
	HMLF	-0.32	-0.34**	–	–	–	0.27
F&F	HF	0.77**	0.67**	0.41**	-0.12	–	0.78
	LF	0.43	0.96**	0.75**	-0.11	–	0.80
	HMLF	-0.47	-0.29**	-0.33**	-0.02	–	0.40
Carhart	HF	0.74**	0.68**	0.44**	-0.11	0.05	0.78
	LF	0.50	0.95**	0.69**	-0.14	-0.10	0.80
	HMLF	-0.59*	-0.26**	-0.23**	0.02	0.16**	0.42
Panel B: July 2011 to June 2018 (84 months)							
CAPM	HF	0.14	0.58**	–	–	–	0.69
	LF	-0.37	0.85**	–	–	–	0.69
	HMLF	-0.31	-0.27**	–	–	–	0.26
F&F	HF	0.29	0.59**	0.17**	-0.02	–	0.72
	LF	0.11	0.86**	0.56**	-0.02	–	0.83
	HMLF	-0.64**	-0.27**	-0.38**	0.00	–	0.51
Carhart	HF	0.31	0.58**	0.16	-0.02	-0.02	0.72
	LF	0.28	0.79**	0.40**	-0.04	-0.21**	0.84
	HMLF	-0.80**	-0.20**	-0.24**	0.02	0.20**	0.56

Note.: Regressions estimated with ordinary least squares and robust standard errors with monthly returns. HF is the portfolio of the companies with F-Score greater or equal to 7 and LF is the portfolio of companies with F-Score less or equal to 4. HMLF is the difference between HF and LF portfolio returns in each month. The CAPM, Fama and French 3-factor (F&F) and Carhart models were defined in Equations 1, 2 and 3, respectively. The alpha (α) is in percent per month and is the intercept of the regression. β is the coefficient in relation to the market risk premium. *s*, *h*, and *w* are the coefficients of the size (SMB), value (HML), and momentum (WML) risk factors, respectively. ** and * indicate significance at the 5% and 10% levels, respectively.

The SMB factor coefficient was positive and significant in most cases, indicating that returns on the equally weighted HF and LF portfolios were dominated by those from the smaller and high HF companies, which is consistent with the findings in Galdi and Lopes (2013). Moreover, this coefficient was higher for the LF portfolio indicating that it tends to have smaller companies, which is also consistent with smaller companies having worse fundamentals (Fama and French, 1993). There was no significance for the HML factor coefficients suggesting that companies in the HF and LF portfolios cannot be characterized as value or growth stocks, corroborating evidence that the behavior of this factor in the Brazilian market varies with the period and portfolio studied (Machado et al., 2017; Machado and Medeiros, 2014; Cordeiro and Machado, 2013; Rayes et al., 2012; Machado and Medeiros, 2011). These results are about the same with or without the WML risk factor. Finally, the WML coefficient was negative and significant for the LF portfolio in the sub-period when the full IFRS adoption had been completed, providing some additional evidence that companies that had worse returns in the 12 months prior to portfolio formation dominated the return on the LF portfolio.

The portfolio long in the HF portfolio and short in the LF portfolio (HMLF) showed only a marginally significant and negative alpha for the Carhart (1997) model with all betas negative and significant, suggesting that this is a countercyclical portfolio with a potential for value destruction for the investor. The SMB factor coefficient was also negative and significant, indicating that medium and large companies concentrate stocks with better fundamentals than small companies. Once more, there was no significance for the HML factor coefficients but there was an indication of a momentum effect for HMLF with the positive and significant coefficient for the WML factor. If value-weighted portfolios were employed in lieu of the equally weighted portfolios, which favor smaller stocks, they would sway the results even more towards larger companies. Finally, the other results for the period beginning in July 2011, after completion of the accounting convergence to international standards, are in Panel B of Table 3 and are analogous to those presented in Panel A, with the notable exception of the loss of significance of the HF portfolios alphas.

Overall, these results confirm H2 that states that a high F-Score strategy is not able to generate alpha, even though it presents higher average and median returns and lower total and beta risks. These results, even in the absence of alpha, highlight the importance of corporate accounting fundamentals to investors.

5. Conclusions and implications

This article employed the Piotroski (2000) F-Score metric that assesses the quality of a firm's fundamentals to verify if they are related to the generation of abnormal returns. The gradual adoption of the IFRS is included in the sample period that initiates in July 2008 and ends in June 2018. The analysis was repeated for the period between July 2011 and June 2018 in which the adoption of the IFRS for listed companies had been completed. The sample includes an average of 146 companies per year. Equally weighted portfolios were built with companies according to their F-Scores at the end of June of each year with information available at the end of December of the previous year in order to avoid de look-ahead bias.

Only the high F-Score portfolio displayed a positive and significant alpha for the full sample period but it disappeared in the period initiating in 2011. The evidence on the alpha generation potential presented here was not conclusive, as it depended on the period studied and confirms the hypothesis that high F-Score portfolios may not generate alpha. This is consistent with what Hyde (2014) reports for Brazil but not consistent with what Hyde (2018, 2014) reports for other countries. The evidence regarding market risk (beta) was more robust and showed that the portfolio with companies with better fundamentals presented lower beta than the one with worse fundamentals, which is consistent with Asness et al. (2019). The high F-Score portfolio presented greater average and median returns than the low and medium F-Score portfolios, which supports the findings of Abarbanell and Bushee (1998) for greater returns for companies with better fundamentals. Equal weighting and the significant coefficients for the size premium risk factor suggest that large companies do not dominate the return of the high F-Score portfolio, which is in line with the Brazilian findings in Galdi and Lopes (2013). The risk factor of the premium for value stocks was not significant and did not appear to be related to portfolio composition according to the F-Score. The portfolios with the lowest F-Score presented a negative and significant coefficient for the momentum risk factor in the sub-period initiating in 2011, suggesting persistence of negative returns.

These results imply that portfolios composed of companies with higher F-Score and that preferably focus on stocks of medium or smaller companies have the potential to offer an attractive average return with less market risk and a lower risk of catastrophic returns, even though one should not expect to attain a positive and significant alpha. This portfolio is defensive and may be particularly relevant for less sophisticated individual investors that do not have the time, talent and resources to carry out a proper fundamental analysis. The F-Score may also be a criterion to form an index or ETF. The analysis presented herein also contributes to show that a high F-Score portfolio is not a value stock portfolio. This study was also the first to address the F-Score in a period of homogeneous accounting standards for Brazilian listed companies. Finally, it should be noted that the equal weighting of portfolios indicated that companies with good fundamentals and medium size might be a good choice for the investor.

Some suggestions for future research may be set forth. First, as the sample period is always relatively short in Brazil, simulation techniques can be employed on the return series of the F-Score portfolios to obtain an alpha distribution and have a more robust inference about it. Alternatively, it may be that omitted factors explain the achievement of a positive and significant alpha in the full sample period. Examples of candidates for such factors would be the Betting Against Beta (BAB), which reflects the tendency to buy low beta stocks, while avoiding high beta ones, and the Quality Minus Junk (QMJ) factor, which reflects a tendency to buy profitable, growing, safe and high dividend yield companies, proposed by Frazzini and Pedersen (2014) and Asness et al. (2019), respectively. Moreover, the two additional factors of the Fama and French (2015) five-factor model could also be considered. These additional factors would possibly eliminate the significance of alpha in all cases for companies with high F-Score because they also presented lower betas, which is a common feature between these companies and factors.

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Management Accounting Practices, Quality, and Performance in the Context of a Natural Monopoly

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Abstract

Objective: This paper aims to analyze the relationship between the use of management accounting artefacts and size, performance, and perceived service quality provided by Brazilian electric power distribution public utility concessionaires, a sector configured as a natural monopoly, marked by a large number of regulations and restricted to a limited number of performance strategies.

Method: The research involved 22 concessionaires from a universe of 63; for the relationship analyses, the non-parametric chi-squared, Kruskal-Wallis, Mann-Whitney U, and Kendall's τ tests were used.

Results: Results show a higher frequency in the use of traditional artifacts and suggest that the use of artifacts is related with the company size. No relationship could be verified though between the use of these artifacts and performance, nor with service quality. It may be concluded that in this context of natural monopoly, information obtained through artifacts do not lend themselves to the improvement of operations, even if a small number of organizations have taken initiatives in this sense.

Contribution: Various studies have investigated the relationship between management accounting practice (artifacts) and organizational performance in different contexts, however, very little is known about this relationship in highly regulated sectors.

Keywords: Management accounting. Management accounting artifacts. Electric utility companies.

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1. Introduction

The electricity sector is a natural monopoly, that is, its structure is based on the fact that the maximization of results and full efficiency in the use of resources in this economic activity are only possible when performed in conditions of exclusivity (Figueiredo, 2016). In this context, based on Law 8.987 of February 13th, 1995, which deals with the concessions and permissions for rendering public services, the adoption of differentiated tariffs was established, thus opening up a new phase for the services related to the distribution of electricity in the country: the State took on the role of regulator and supervisor of infrastructural services, aiming to reduce costs and charges and, at the same time, aiming for the quality of the services provided to society.

Based on this new institutional configuration, the National Electric Energy Agency (Aneel) would intend to align the companies' management with the provision of qualified and efficient services at competitive prices. Thus, among the main aspects of the new regulatory framework, the agency was concerned with determining the quality standards of the energy distribution services, monitoring the concessionaires' operations and fixing tariffs, considering that the determination of a ceiling price would encourage concessionaires to seek productivity through cost reduction (Pessanha, Souza, & Laurencel, 2007). For the concessionaires, the financial performance would tend to improve as operational efficiency increases, the levels of losses drop, default decreases, the transmission and distribution systems are improved and the number of regular consumers increases (Silvestre, Matos, & Filgueira, 2010). In view of this scenario, it is argued that the management accounting practices (or artifacts) – a comprehensive description of artifacts, activities, tools, management philosophies, tools, costing methods, management models, assessment methods, or costing systems management accounting professionals use in their activities (i.e., variable and standard absorption costing; present value and simulation, Benchmarking, Kaizen, Just-in-Time, etc.) (Soutes & Guerreiro, 2007) - would offer essential support to the decision-making process at the level of the concessionaires, mainly because it permits a detailed examination about the performance of activities, projects, products and the general economic-financial performance (Atkinson, Kaplan, Matsumura, & Young, 2015; Crepaldi & Crepaldi, 2014).

Based on the profitability and growth challenges of the electricity distribution companies, it can be assumed that a direct association exists between their economic-financial performance (in addition to size and perceived quality) and the use of artifacts, especially the so-called "modern" artifacts, as those artifacts are able to grant further grounds and security to decision makers regarding the reduction of losses in operations and the generation of value than the so-called traditional artifacts, these being more related to the determination of costs and the collection of information for financial control and planning.

Thus, this research starts from the following question: **Is there an association between the use of modern accounting artifacts and the size, quality of services provided and economic-financial performance in these companies?** The objective is to investigate the relationship between the use of these artifacts and the variables "size", "perceived quality", and" performance " in the scope of the power distribution concession companies.

Amidst the studies that investigate the relationship between management accounting practices and the organizational performance in various contexts, including Milk, Diehl, & Manvailer, 2015; Gonzaga, Luz, Guimarães, & Valerio, Junior, 2010; Espejo, Portulhak, & Martinez, 2015; Klein & Anderson, 2017; Soutes & Guerrero, 2007; Sulaiman, Ahmad, & Alwi, 2004), little is known about this relationship in the context of highly regulated sectors, i.e., natural monopolies. Moreover, there are no studies yet that explore how those practices influence the quality perceived by customers, a measure of value generation from the perspective of the strategy. Finally, this research contributes with *insights* to company managers in the sector, specifically on possible complementarities between financial and quality measures - thus contributing to the verification of the financial impact based on the generation of value - and on how the use of modern artifacts can help in the identification of low-cost initiatives that can contribute to the increase of perceived quality, which can bring intangible returns via reputation.

In the next section, we present a review of the literature, together with the respective hypotheses; followed by the method and the description of each analyzed variable, sampling procedure, data collection, and analysis procedures; the analysis of results, including further studies of the data obtained, and the conclusion, where mainly the findings are emphasized, which take the form of theoretical contributions, as well as suggestions for further research and fundamental references (mostly scientific papers and documents) for the research.

2. Literature Review

The set of artifacts and the verification of their use in this research context was based on the work of Soutes (2006) and the document *International Management Accounting Practice Statement* (IMAP #1): Mana*gement Accounting Concepts* cited by the same author(*International Federation of Accountants*, 1998). The classification of the artifacts into traditional and modern was also adopted based on the contributions of Sulaiman et al. (2004) and Soutes and Guerreiro (2007); this classification is legitimized by previous studies, such as Bjoornenak and Olson (1999), but it is also widely accepted in other research on the subject as verified through various citations.

Regarding the classification, this rests on the evolutionary stages of management accounting practices, in which are classified in traditional artifacts those present in the 1st and 2nd stages are classified under traditional artifacts, while those in the 3rd and 4th stages of the evolution are considered modern artifacts.

- **1st stage:** artifacts aimed at determining the cost and financial control, i.e., absorption costing, variable costing, standard costing, return on investment.
- **2nd stage:** artifacts focused on information for control and management planning, i.e., transfer price, constant currency, present value, budget, and decentralization.
- **3rd stage:** artifacts aimed at reducing resource losses in the operational process, i.e., activity-based costing, target costing, benchmarking, kaizen, just in time (JIT), theory of constraints, strategic planning, activity-based management (ABM).
- **4th stage:** artifacts aimed at creating value through the effective use of resources: economic value added (EVA), simulation, GECON, balanced scorecard, value-based management (VBM) (Soutes, 2006; International Federation of Accountants, 1998).

2.1 Use of modern artifacts and growth/company size

In relation to studies on the relationship between the use of modern artifacts and organizational size or growth, a significant convergence of results cannot be verified yet.

In a comprehensive review of the literature on the practice of managerial accounting in companies from China, India, Malaysia and Singapore, Sulaiman *et al.* (2004) found the predominant use of traditional artifacts to the detriment of modern artifacts. Although the authors argue about the insufficient information resulting from traditional artifacts like standard costing, budget, and break-even point in a sectoral context of high competition, they also recognize the potential costs of implementation of so-called modern artifacts in the sample, specifically in traditional manufacturing companies operating in hardly innovative sectors. Thus, considering the competitive dynamics as a factor that stimulates the use of modern artifacts, the authors draw attention to the need for awareness-raising about the existence of these artifacts, in addition to the lack of expertise and support from high management for their effective implementation. Based on these results, one can argue that the use of modern artifacts can take place according to the requirements of the business environment, i.e., in more dynamic sectors.

The study by Teixeira, Gonzaga, Santos, and Nossa (2011), based on the two hundred largest companies in the state of Espírito Santo and the use of artifacts, does not show a significant association between the use of modern artifacts and size; however, there are indications that the amount of assets is positively associated with a greater number of artifacts used and the intensity of this use. This conclusion complements the findings of Sulaiman et al. (2004) that the use of modern artifacts would be more related to the growth potential of the organization (based on the dynamics of the sector), rather than the size itself.

In an exploratory study involving nine publicly traded family companies in Brazil, Grande and Beuren (2011) sought to identify variations in management accounting practices from the management reports in the period between 1998 and 2007. Throughout this period, the authors identified the predominance of practices more focused on determining financial costs and control and reducing waste, stages 1 and 3 of the IMAP report #1, (*International Federation of Accountants*, 1998). Practices more related to the provision of information for planning and management control, as well as for the creation of value through effective resource use, that is, more complex practices that are more linked to strategic aspects, were partially verified, although not consolidated. Based on this study, it is verified that, even in a sample of large companies, the influence of family standards hardly matters in a professional organizational structure. Moreover, given the size of the analyzed companies, there is no direct relationship between the use of more modern practices and growth, suggesting that there is no direct relationship between size and the use of practices in this category.

Espejo, Portulhak and Martins (2015) investigated the management control practices in 45 federal university hospitals and showed that, in thirteen of the hospitals analyzed, there is a "low adherence" to artifacts. Among the most used practices, strategic planning and isolated analysis of revenues, costs and expenses, cost centers and service groups were identified. More advanced practices were identified in only two of the large hospitals. Thus, even when considering different samples of companies in different sectors, it can be verified that these results corroborate the developments pointed out in Grande and Beuren (2011).

By means of an organizational life-cycle approach, Paulo and Cintra (2018) noted how the use of these practices changes over the life-cycle of a firm in a sector marked by strong competitive dynamics, identifying that the company, in each of the life cycles, used management artifacts as the basis of its growth, but in a reactive and *ad hoc* manner, that is to say, in response to the problems that emerged with the growth of the company and the complexity of its operations. These results illustrate a partial relationship between size/growth and the use of modern artifacts.

Based on the contributions presented here, it can be concluded that there is no clearly direct relationship yet between the organizational size and the use of modern management accounting artifacts. Nevertheless, they shed light on the aspect of competitive dynamics and the complexity of problems and issues experienced based on the growth as factors that certainly influence the use of modern artifacts. Considering the activity limits of distribution companies within the new regulatory framework, i.e., delimitation of tariffs, requirement of quality standards, it can be inferred that the use of modern artifacts is much more preponderant for the growth strategies of these companies. Thus, the following hypothesis can be derived for the research in question:

H1: A positive association exists between the use of modern management accounting artifacts and the size in electric energy concessionaires.

2.2 Use of modern artifacts and company performance

Discussing the relationship between the use of modern artifacts in companies and organizational performance, Ittner and Larcker (1995) point out that the use of accounting practices cannot be linked to a competitive advantage, that is, to superior performance in relation to competitors. In a subsequent study (Ittner & Larcker, 1997), the authors showed, from a sample of companies from different countries, that the performance obtained from accounting practices or strategic control mechanisms varies from sector to sector; by arguing the companies' need for creative and flexible responses, the authors also showed that, in various contexts, the use of strategic controls can reduce the company's performance.

In Brazil, the study by Soutes and Guerreiro (2007) similarly pointed out that companies that used modern artifacts also displayed distinguished performance indices. No relationships were identified though between the use of artifacts and variables such as size, activity sector and shareholder control. In another sample of companies, Guerreiro and Soutes (2013), analyzing the relationship between *time-based management* techniques and organizational performance, did not identify an association between the use of these more complex techniques and the return on assets, a key indicator of productivity. This result leads us to believe that, despite the use of such practices, there are restrictions or bottlenecks beyond the organizational environment.

Gonzaga, Luz, Guimarães and Valerio Júnior (2010), when relating the size of the companies and the use of artifacts (i.e., *benchmarking*, budget, *balanced scorecard*, standard costing, strategic planning, absorption costing, transfer price, and variable costing) showed a positive relationship between the quantity and intensity of artifact usage and the value of the companies' assets, that is, a direct relationship was identified between the use of artifacts and performance.

In a study in Minas Gerais involving 68 agricultural cooperatives, Reis and Teixeira (2013) found that 19 of them, which used modern artifacts, presented average revenues and assets about 2 to 3.4 times higher than those using more traditional artifacts; these results lead us to believe that the use of modern artifacts contributes to organizational performance, although the reasons and underlying aspects need to be better investigated. In this same line, Morais, Coelho and Holland (2014), when examining the association between the use of artifacts and the goal of maximizing value in publicly traded companies in Brazil, illustrate that the amount of artifacts implemented does not contribute to maximizing the company's performance, but rather to its continuous modernization. Therefore, a more detailed discussion of this relationship is needed, involving the context of analysis of these artifacts, the speed of effective implementation (and institutionalization of these artifacts), as well as the main factors that influence their implementation in view of the competitive context.

From the above studies, a clear relationship between the use of modern artifacts and performance cannot yet be verified, a fact that entails the need for further verifications, in addition to greater consideration of the competitive context. In this case, due to regulatory limitations regarding tariffs and quality standards required of energy distribution companies, it can be argued that they can increase their performance through the use of modern management accounting practices, especially by means of decisions that influence the operational and financial efficiency. Thus, the following hypothesis was established:

H2: there is a positive relationship between the use of modern artifacts of management accounting and the economic-financial performance of electric energy concession companies.

2.3 Use of modern artifacts and quality

Despite the relationship of complementarity between quality management and management accounting, considering its effects on the performance of companies (Sedevich-Fons, 2018), in general, no studies were identified that analyze the relationship between companies' use of modern accounting artifacts and the perception of product and service quality. Nevertheless, some studies identified in this line served as support to ground the relationship between the use of artifacts and perceived quality, that is, the evaluation of product and service quality by the end customer.

One of the first studies to relate management accounting practices and quality is also Ittner and Larcker (1995) who, through extensive research involving companies in the automotive and computer sectors, showed that quality, as a management philosophy, is directly associated with the informational support of modern management accounting practices. Similarly, Ittner and Larcker (1997) showed, based on a sample of companies from different countries, the relevance of accounting information support to management actions focused on quality and that this information or necessary controls vary among sectors.

More recently, in a research conducted in the Brazilian context, specifically in the hotel sector, Lunkes et al. (2018) pointed to a trend to use non-financial measures, more focused on innovation and activity-based management, despite the predominance of the use of traditional management accounting practices. Considering the operational context of the hotel sector, marked by seasonality, demand volatility, perishability, reduced service time, high levels of investment in fixed assets and fixed costs, in addition to diverse and intensive labor, it can be concluded that quality is a key measure to guide and evaluate the multiplicity of operations as a means of differentiation or loyalty. This aspect illustrates a natural inclination to adopt accounting practices that adhere to the need of customers, as there are few possible strategies to increase revenues, to the detriment of optimization strategies. This same logic can be extrapolated to sectors such as energy, in which the setting of price limits (Pessanha et al., 2007) ends up limiting strategies to increase revenues. Thus, assuming that companies in the energy sector would tend to use informational subsidies through modern artifacts to ensure better controls and quality actions in their services in line with regulatory standards, the following hypothesis is suggested:

H3: A positive relationship exists between the use of modern management accounting artifacts and the consumer's perception of the service quality provided by electric energy concessionaires.

Based on this literature review, the next section presents the methodological aspects of the research, including descriptions of the approach, description and process of data collection and analytical procedures.

3. Method

In view of the research objective, a quantitative approach was adopted, using both secondary and primary data. The secondary data included sectoral documents obtained from the websites of the National Electric Energy Agency (Aneel), the Brazilian Association of Electric Energy Distributors (Abradee), and the reports are published on the websites of the companies, the concessionaires, while the primary data were obtained through a questionnaire sent to professionals working in the accounting, administrative and financial areas, who were knowledgeable on the management accounting routines and practices of the respective companies where they worked.

Regarding the sample, it should be highlighted that Brazil has 101 electricity distributors, 63 of them holding concessions and 38 licenses, in addition to 13 rural electrification cooperatives whose operation is governed by precarious authorization and going through regularization to receive a concession or license (Aneel, 2016a). Initially, the 101 distributors were considered, however, due to the low response rate, it was decided to work with the 63 concessionaires. Of these, 73% are private equity firms. As for size, 59% are large (>1 TWh) and 41% small. Thus, for procedural purposes, non-probabilistic sampling was considered, a situation in which the elements are chosen deliberately, but whose results are not representative of the population (Fonseca & Martins, 2012). In this line of reasoning, we adopted the quota sampling technique to maintain the proportionality of fundamental characteristics present in the population in the final sample (Curwin & Slater, 2007; Cochran, 2007). Quota sampling is a sample deliberately selected based on the judgment of the researcher, restricted to two stages: the generation of categories or quotas of control elements of the population and the selection of sample elements, based on convenience or judgment (Malhotra, 2012). Thus, 22 concessionaires were selected from a universe of 63 companies (35% of the population), observing their size (small or large) and the origin of capital (public or private), as shown in Table 1.

Table 1
Dimensions of the research universe and sample

Size	Private				Public			
	Universe	%	Sample	%	Universe	%	Sample	%
Large	25	54%	8	53%	12	71%	5	71%
Small	21	46%	7	47%	5	29%	2	29%
Total	**46**	**100%**	**15**	**100%**	**17**	**100%**	**7**	**100%**

Regarding the subjects' profile, it should be emphasized that three of them each answer for two companies. Thus, there are 19 respondents, 16 of whom work in the accounting area and the others in planning and/or control. Thirteen of them have been working in the current company for more than ten years, and the average time of experience after obtaining the undergraduate degree is 12 years. As for the degree of knowledge about the artifacts, 73% affirmed they had knowledge and 27% said they had little knowledge about the artifacts. Only the respondent from the concessionaire CPFL claimed to have in-depth knowledge on the subject. A brief characterization of the respondents is shown in Table 2.

Table 2
Profile of research subjects

Respondent	Concessionaire	Position	Educational background	Experience in the company (years)
1	COELCE / AMPLA	Planning and Control Manager	Accountancy	2
2	CELG Distribuição S/A	Economic and Financial Planning Superintendent	Economic Sciences	13
3	CEMIG	Controllership Superintendent	Accountancy	30
4	COPEL	Accounting Manager	Accountancy	13
5	LIGHT	Accounting Manager	Accountancy	7
6	CEEE D	Accountant	Accountancy	11
7	CEMAR / CELPA	Budget coordinator	Accountancy	1
8	CEB Distribuição	Accountant	Accountancy	6
9	ELETROCAR	Accounting Manager	Accountancy	37
10	BANDEIRANTE / ESCELSA	Accounting Manager	Accountancy	9
11	Muxfeldt, Marin e Cia. Ltda.	Accounting Supervisor	Accountancy	20
12	Força e Luz Coronel Vivida Ltda.	Administrative Adviser	Administration	30
13	CHESP	Accounting department manager	Accountancy	40
14	Nova Palma Energia Ltda.	Accountant	Accountancy	2
15	DME Distribuição S/A	Accounting Manager	Accountancy	27
16	Iguaçu Distribuidora de Energia Elétrica Ltda.	Accountant	Accountancy	30
17	COCEL	Accountant	Accountancy	16
18	Hidroelétrica Panambi S/A	Accounting Supervisor	Accountancy	15
19	CPFL Energia	Accounting Coordinator	Accountancy	19

The questionnaire, prepared based on the list of artifacts presented in Soutes (2006), aimed to gather information about the companies' knowledge and use of the artifacts. It was applied throughout the second semester of 2017.

Combining the primary and secondary data for analysis, Table 3 below describes the respective data sources, analysis variables and their breakdown.

Table 3

Variables used in the research

Variables	Specification of the variables	Source
Accounting artifacts	Activities, tools, instruments, philosophies and management models used by management accounting professionals in the practice of their functions (Soutes, 2006).	Data obtained from a questionnaire based on Soutes (2006) and *International Federation of Accountants* (1998)[1]
Performance	$Efficiency = \frac{PMSO_{A^2}}{PMSO_{R^3}} - 1$	ANEEL (2016a; 2016b; 2017)
	$Profitability = \frac{EBIT_{A^4} - EBIT_{R^5}}{BRL^6}$	ANEEL (2016a; 2016b; 2017)
	Overall performance continuity indicator (DGC): examines the level of continuity of the service the distributor provided in relation to the limits set by ANEEL for its concession area and in comparison to the other distributors. For the calculation, the following indicators are considered: *DEC*[7] and *FEC*[8].	ANEEL (2013; 2016a; 2016b; 2017)
Aneel Consumer Satisfaction Index (Iasc)	Residential consumer satisfaction indicator regarding the services provided, consisting of five variables: perceived quality, perceived value, overall satisfaction, trust in the supplier and fidelity.	ANEEL (2016b; 2017)
Size of the concessionaire	Companies are considered large when the billing exceeds 1 TWh (terawatt hour), and small when equal to or lower than 1 TWh.	ANEEL (2016a)
Origin of capital	Stock control can be public or private.	ABDEE

Obs.: [1]A non-updated list of these artifacts was chosen due to the possibility to compare the results with other studies that used the inventory based on Soutes (2006), departing from IFAC (1998). [2]$PMSO_A$ = Adjusted indicator of personnel, material, services, and others for the past 12 months. [3]$PMSO_R$ = Regulatory indicator of personnel, material, services, and others for the past 12 months. [4]$EBIT_A$ = adjusted earnings before interests and taxes for the past 12 months. [5]$EBIT_R$ = regulated earnings before interests and taxes for the past 12 months. [6]*BRL* = Net remuneration base. [7]*DEC* = Equivalent Duration of Interruption per Consumer Unit: number of hours a consumer had no electric energy during a certain period. [8]*FEC* = Equivalent Interruption Frequency per Consumption Unit: identifies how many times, on average, electric energy was interrupted at the consumer unit.

In relation to sector-specific performance measures, profitability is obtained by the quotient of the difference between the realized operating profit (Ebit) and regulatory operating profit (realized less regulatory) by the net remuneration base (amount of investments made by companies in the provision of services to be covered by tariffs charged to consumers). Thus, the higher the index, the more profitable the enterprise. Efficiency, in turn, is obtained through the quotient between the efficiency of personnel, material, services, and other expenses (realized PMSO) and the regulatory PMSO, a level considered as a *benchmark* for energy distribution companies. Thus, the higher the value obtained from this quotient, the lower the company's efficiency in cost management. On the other hand, the overall performance continuity indicator, an operational indicator, is calculated by means of the simple arithmetic mean of the ratios between the values realized and the annual regulatory limits of the indicators equivalent duration of interruption per consumer (DEC) and equivalent frequency of interruption per consumer unit (FEC). Thus, DGC indices lower than 1 are desirable, as this is a regulatory limit for interruptions in power transmission.

The perceived quality of energy distribution services is measured by a general residential consumer satisfaction indicator composed of five variables: perceived quality, perceived value, overall satisfaction, trust in the supplier and fidelity. Perceived quality consists of 17 items, grouped into three dimensions: information to the client, access to the company and reliability of the services; perceived value evaluates the user's perception in the economic dimension (3 items); overall satisfaction, broad satisfaction with the company and distance between the company under analysis and a company that is perceived as the ideal (3 items), trust in the provider from the point of view of the consumer (4 items), and loyalty, as measured from the analysis of the intent to exchange (3 items). Each of these five variables uses a distinct evaluation scale and each indicator is calculated using Partial Least Squares (PLS) modeling and then weighted in the Aneel Consumer Satisfaction Index (Iasc). The data to calculate these indicators are collected each year through interviews in randomly selected households.

For the statistical analysis of the hypotheses, the nonparametric tests highlighted in Table 4 were used.

Table 4
Tests used to treat the hypotheses

	Treatment	
H1	A positive association exists between the use of modern management accounting artifacts and the size in electric energy concessionaires.	Chi-squared test (χ^2)
H2	A positive relationship exists between the use of modern management accounting artifacts and the economic-financial performance of electric energy concessionaires.	Mann-Whitney test (U)
H3	A positive relationship exists between the use of modern management accounting artifacts and the consumer's perception of the service quality provided by electric energy concessionaires.	Mann-Whitney test (U)

Nonparametric tests are applicable to the analysis of small samples (N<30) and do not depend on population parameters such as mean, variance, standard deviation etc., derived from their respective sample estimates (Fonseca & Martins, 2012; Bruni, 2012). To obtain group profiles among the associated variables, the Kendall test was used (Field, 2009). To develop the analyses, IBM *softwareStatistical Package for the Social Sciences* (SPSS) version 18 was used.

In the next section, the data analysis is presented based on a documentary survey and a questionnaire in the energy companies' planning and controllership areas.

4. Analysis of Results

Based on an initial descriptive analysis of the use of the management accounting artifacts in the selected sample, among the modern artifacts, the predominance of strategic planning (19 companies), *benchmarking* (18 firms), and the *Balanced Scorecard* (19 companies) was verified; with regard to the use of traditional artifacts, these being used more than the modern ones, the budget (20 companies), variable costing (18 companies), return-on-investment (16 companies) and value-based management (VBM) (15 companies) stand out; the least used artifacts, all of which are classified as modern, are: *kaizen* (2 companies), Gecon (2 companies) and Just-in-Time (3 companies). The predominant use of traditional over modern artifacts is noticed, as 16 companies (73% of the sample) use mostly traditional artifacts, differently from results like Soutes and Guerreiro (2007), in which 66% of the companies under analysis used modern artifacts. This is a relevant finding as, assuming that the regulatory influence described by Pessanha et al. (2007) and Silvestre et al. (2010) required the use of modern artifacts, more directed to reducing resource losses in the operational process and value creation through operations (Soutes, 2006; *International Federation of Accountants*, 1998), it was expected that most of the companies investigated would make use of these artifacts rather than of more traditional ones. In addition, the variables previously defined for the study are more directly associated with the purpose of the so-called modern artifacts.

When verifying the respondents' knowledge about the management accounting artifacts, it was observed that 73% of them have knowledge; the other respondents revealed either little or no knowledge.

Regarding the reliability of the responses regarding the use of artifacts, identified by the Cronbach's alpha test, a value of 0.9 was obtained, thus indicating an excellent level for statistical inferences with 90%, higher than what is generally accepted, that is, 0.7 (HAIR et al., 2009).

4.1 Use of modern artifacts and company size

To test hypothesis H1, we used the Chi-Squared test (χ^2), aiming to detect a significant association between two categorical variables (Field, 2009). As the χ^2 coefficients in the table of critical values depend on the level of significance adopted and the number of degrees of freedom, a 5% significance level (α) was used. For the sake of analysis, the responses favorable to the use of modern artifacts were restricted to grades 4 and 5 on a scale from 1 to 5 (Table 5).

Table 5
Calculation of contingency and Chi-squared test of association between use of modern artifacts and the size of the enterprise

Size	Yes (grades 4 and 5)		No (grades 1, 2 and 3)		Total
	Answers	Chi-squared	Answers	Chi-squared	
Large	90	1.85	79	1.58	
Small	42	2.67	75	2.29	
Total	**132**	-	**154**	-	**286**

4.2 Use of modern artifacts and performance

To test H2, we considered the cross-analysis of the companies' financial indicators for the year 2016 (efficiency, profitability and DGC) with the use or not of modern artifacts. The following rule was adopted for a proper assessment: grade 1 (yes) if the average response on the use of modern artifacts is higher than 3, and 0 (no) if not. To test this hypothesis, the Mann-Whitney test (*U*) was used. According to Bruni (2012), this test is the nonparametric version equivalent to the parametric *t*-test (Student), and should be used in the analysis on two samples, regardless of whether they were extracted based on equal means. The *U* values, calculated from that test, evaluate the degree of interlacing of the data for the two groups after sorting.

The p-value test indicates the probability that more extreme statistical values than what was observed will occur, under the premise that the null hypothesis is true. To examine the null hypothesis against the alternative hypothesis, the scale of evidence suggested by Fisher was used, in which this null hypothesis is rejected for those cases in which the p-value is inferior to 0.05 (Morettin, 2009).

4.2.1 Efficiency indicator

The statistical comparison of the modern artifacts and efficiency indicator variables revealed that the result for the p-value was higher than the significance level (0.8212 > 0.05 with U = 56), concluding that there are no significant differences between the values of the efficiency indicator and the companies that use modern artifacts or not (Figure 1).

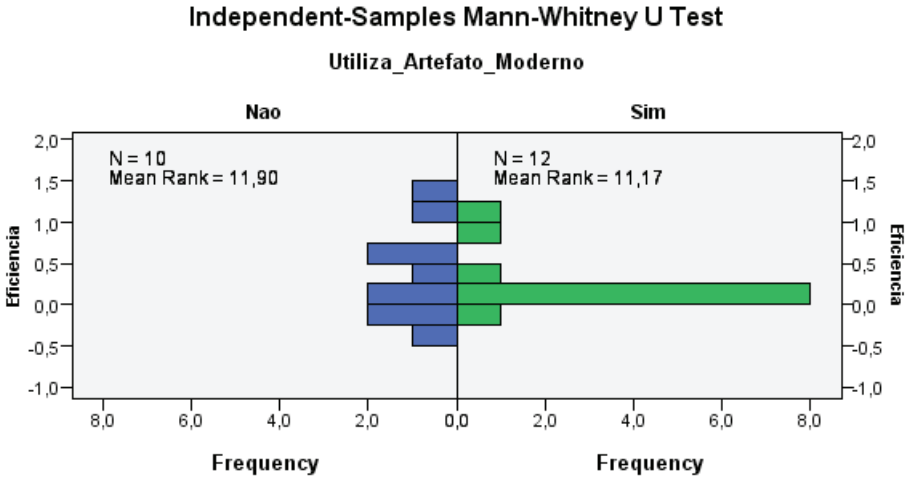

Figure 1. Mann-Whitney efficiency test for independent

4.2.2 Profitability indicator

The evaluation of the variables modern artifacts and profitability indicator revealed that the result obtained for the p-value was higher than the level of significance (0.2030 > 0.05 with u = 79.5), indicating, therefore, no significant differences between the values of the profitability indicator and the companies that use or not modern artifacts (Figure 2).

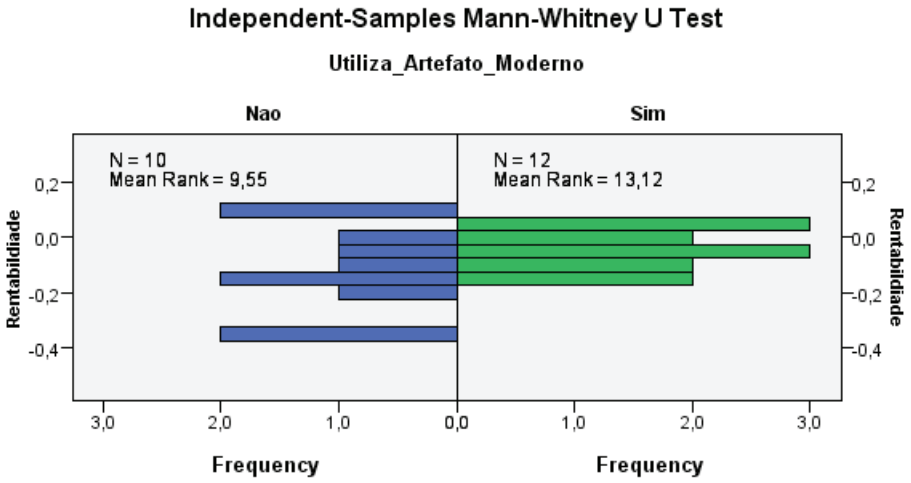

Figure 2. Mann-Whitney profitability test for independent samples

4.2.3 Overall Performance Continuity Indicator (DGC)

When applying the statistical test to the variables modern artifacts and DGC, a p-value higher than the level of significance (0.8212 > 0.05 with u=63.5) was evidenced, thus deducing that there were no relevant differences between the values of the DGC indicator and the companies that use or not modern artifacts (Figure 3).

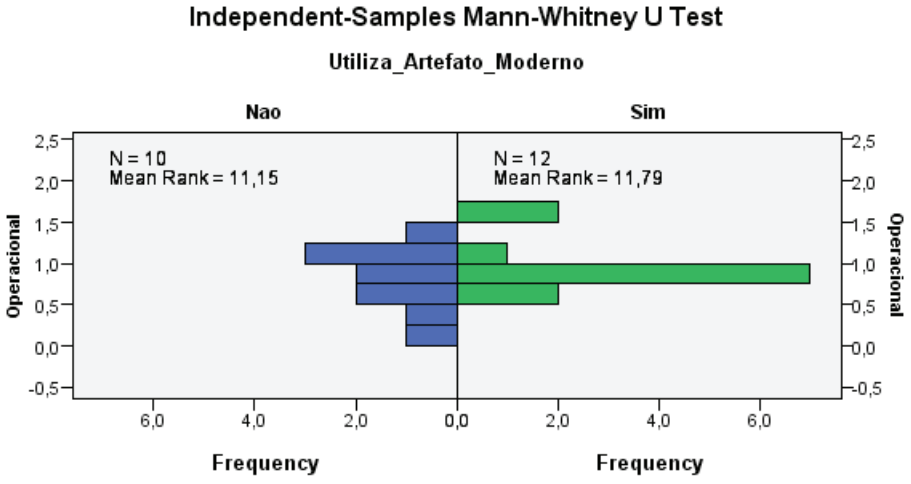

Figure 3. Mann-Whitney operationality test for independent samples (DGC)

The results of this item demonstrate that the use of modern artifacts does not imply better economic-financial performance, converging with the results found by Reis and Teixeira (2013), according to which there is no relationship between the use of modern artifacts and differentiated financial performance, that is, the group classified as traditional presented the same performance averages as the group classified as modern. On the other hand, the results presented here diverge from those found in Soutes and Guerreiro's research (2007), in which the Brazilian companies included in the studied sample used artifacts classified as modern and presented a differentiated financial performance.

In that sense, based on the description of the performance indicators in the methods section, it can be argued that the need to frame the performance within regulatory limits may be a limiting factor to the adoption or incorporation of artifacts. Day-to-day control activities, in this sense, can make the search for managerial improvement via modern artifacts a non-priority aspect, as the regulatory measure itself serves as the "guide" of management efforts, or the search for balance between different indicators is the main objective to be achieved. Thus, it is assumed that more personalized tools are used.

4.2 Use of modern artifacts and perceived quality

To investigate the hypothesis that the use of modern accounting artifacts would imply a better perception of the consumer as to the quality of the services provided by the concessionaires (H3), the Mann-Whitney test was adopted. The result of the statistical test displayed in Figure 4 proves that there are no significant differences between the values of consumer satisfaction indices and the use of modern artifacts, as the p-value was higher than the level of significance (0.0692 > 0.05 with U=32).

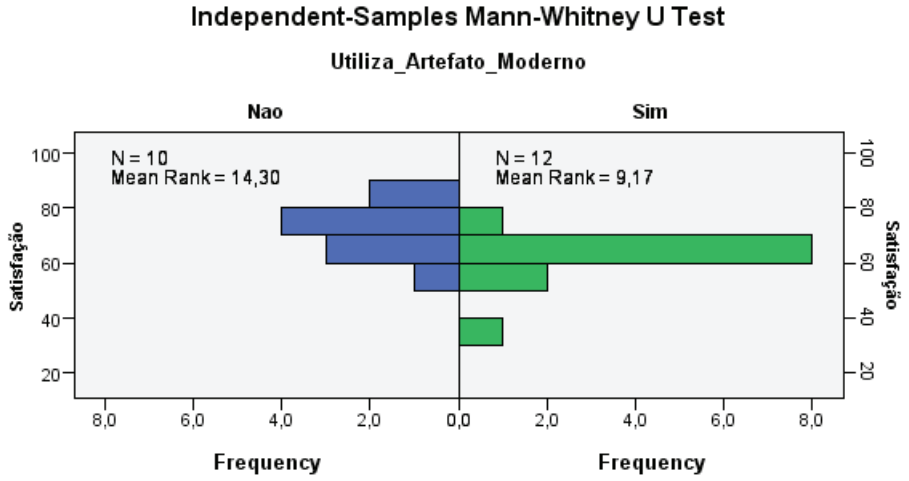

Figure 4. Mann-Whitney test for independent samples (consumer satisfaction)

In view of these considerations and the results obtained, it can be argued that, although the use of the modern artifacts implies a better basis for decisions regarding the reduction of operational costs and value creation for the end customer through operations, their use within the surveyed companies is not preponderant for compliance with the regulatory quality standards.

On the other hand, it is worth discussing some of the indicators: in much of the country, there is no way for the consumer to switch suppliers, which ultimately distorts the fidelity variable (intention to change). In addition, global satisfaction envisages consumer knowledge or discernment about the potential evolution of the company's operations and services, which can also lead to distortions in the evaluations. Therefore, quality indicators may be dissociated from what the modern artifacts can provide in terms of support for strategies to create value for consumers.

Hence, it is speculated that business management as a whole is more focused on meeting the sectoral regulations, which do not necessarily reflect the conditions or value attributes for energy users, which characterizes the government and regulatory agencies as priority *stakeholders*.

4.4 Complementary analyses

As a complement to the analysis of the variables, the Kendall correlation test (τ) was adopted. Kendall's *Tau* is a non-parametric correlation coefficient, similar to Spearman's correlation coefficient, however, used when one has a small set of data and a large number of tied ranks (Field, 2009). This coefficient is used to measure the association between two variables at the ordinal level and its value varies between +1 and -1, Both the sense, whether positive or negative, and the intensity of this relationship can be determined (Malhotra, 2012). Thus, we have H0: τ = 0, when there is no correlation between the two variables and H1: τ 0 0, when there is a correlation between the two variables. If the p-value is below a given significance level (*p-value* < 0.05), the null hypothesis is rejected for that significance level. Table 6 shows the accepted hypothesis, the intensity of the association and the sense of the relationship.

Table 6
Kendall correlation test

Variable	Variable	Kendall τ	P-value	Hipótese
Efficiency	Obs. Modern Artifact	0.0485	0.7556	H0
Efficiency	Obs. Traditional	0.0493	0.7545	H0
Profitability	Obs. Modern Artifact	0.0749	0.6305	H0
Profitability	Obs. Traditional	0.0493	0.7546	H0
Profitability	Efficiency	-0.6711	<,0001*	H1
DGC	Obs. Modern Artifact	0.1363	0.3806	H0
DGC	Obs. Traditional	0.1522	0.3342	H0
DGC	Efficiency	0.3764	0.0151*	H1
DGC	Profitability	-0.2101	0.1750	H0
Satisfaction	Obs. Modern Artifact	-0.2276	0.1417	H0
Satisfaction	Obs. Traditional	-0.2585	0.0997	H0
Satisfaction	Efficiency	-0.3486	0,0239*	H1
Satisfaction	Profitability	0.1482	0.3371	H0
Satisfaction	DGC	-0.2130	0.1667	H0
Qty. Modern Artifacts	Efficiency	0.0774	0.7322	H0
Qty. Modern Artifacts	Profitability	0.1505	0.5037	H0
Qty. Modern Artifacts	DGC	0.3568	0.1031	H0

Obs.: (*) Test significant at 5%.

According to the results shown, the lower the DGC indicator, the lower the efficiency indicator ($\tau = 0.3764$, *p-value* = 0.0151); the higher the company's profitability indicator, the lower the performance indicator ($\tau = -0.6711$, *p-value* < 0.001), and the lower the efficiency indicator, the higher the satisfaction indicator ($\tau = -0.3486$, *p-value* = 0.0239). There is no correlation between the number of modern artifacts used and the economic-financial performance of the concessionaires (*p-value* > 0.05). It is concluded that the DGC and profitability indicators are predominantly correlated, with the efficiency indicator, knowing that the efficiency indicator is the only variable correlated with customer satisfaction. The data suggest that company efficiency can be influenced by a satisfactory financial performance, which in turn can ensure greater consumer satisfaction by targeting resources to quality actions.

According to Aneel (2016A), not infrequently, difficulties related to the distributors' finances stem mainly from the low efficiency in managing operating costs, rather than from the companies' debt volume.

5. Conclusion

This research aimed to analyze the relationship between the use of modern accounting artifacts and the size, economic-financial performance and quality of services provided by a sample of Brazilian electricity distribution concessionaires.

To characterize the accounting artifacts the companies used, data analysis was segregated by stages, considering a higher frequency around the traditional artifacts. Strategic planning is present in 19 of the 22 companies; budget in 20 of them; *benchmarking* in 18 and *Balanced Scorecard* in 19 companies, these being the most used artifacts. On the other hand, Kaizen, in two of the companies; Gecon in two and *Just in Time* in three of them, are the least used artifacts. Overall, it can be concluded that very few concessionaires have their management accounting focused on value creation through the effective use of the funds based on drivers such as value to the customer, shareholder value, and organizational innovation (*International Federation of Management Accountants*, 1998; Soutes & Guerrero, 2007) and that even in sectors with complex regulatory conditions, the use of modern artifacts in line with these requirements is not preponderant, as it was conceived *a priori*.

To verify the relationship between the size of these companies and the use of modern management accounting artifacts, the hypothesis H1 was tested through the Chi-Squared test, proving the existence of an association between the size of the concessionaires and the use of modern artifacts. It can be speculated that, in sectors marked by intense regulation, especially in the case of the electricity sector, organizational growth, mainly through mergers and acquisitions, may be closely related to the use of resources focused on value creation, both for the consumer and for shareholders. Thus, the use of the modern artifacts becomes essential.

Regarding the existence of an association between the use of modern management accounting artifacts and economic-financial performance, hypothesis H2, its rejection was verified through Mann-Whitney U's test, i.e., it cannot be affirmed that the use of modern management accounting artifacts is related to the economic-financial performance. Based on a comparison with previous studies, this finding converged with the research by Reis and Teixeira (2013), but diverged from Soutes and Guerreiro (2007). It should be emphasized that those authors use a plural sample with companies from different sectors, unlike this study that uses a sample of companies with a specific profile. Thus, in order to enhance the visibility of the relationship between the use of artifacts and performance, further investigations are suggested about institutional influences on the drivers of these companies' operating costs, starting from the premise that charges deriving from regulatory frameworks do not necessarily require more sophisticated functions of management accounting practices to support management decision making. On the other hand, if the use of the modern artifacts in this regulatory context is essential, it can be argued that the adoption and institutionalization of these practices in the analyzed companies deserve a more detailed look. In this sphere of analysis, legal demands may supplant the need for management accounting practices more aligned with value creation by management.

To evaluate the relationship between the use of artifacts and the level of quality of the services provided by these companies, we applied hypothesis H3, according to which the use of the modern artifacts contributes towards a better consumer perception of the services provided by the concessionaires. The result of Mann-Whitney's U test rejected this hypothesis, which leads to the conclusion that there are no relevant differences between the coefficients of the Satisfaction Index and the use of modern artifacts. The absence of a relationship between the use of the modern artifacts and the quality perceived by the consumers of the companies in the sample leads us to believe that quality indicators are independent of the use of management accounting practices more focused on value creation, with low-cost actions such as transparency as an important factor of perceived quality.

According to Table 5, adopting the Kendall correlation test, it can be concluded that there is no correlation between the number of artifacts and the economic-financial performance of the concessionaires. The DGC and profitability indicators are significantly correlated with the efficiency indicator though, which, in turn, is exceptionally correlated with customer satisfaction. Therefore, a further causal check is suggested between the efficiency of companies and their consequent financial performance, and the guarantee of a better perceived service quality by the consumer.

Given these considerations, it is emphasized that the main contribution of this study is the fact that most of the companies in this investigation do not yet perceive the modern artifacts as relevant to the creation of value to the consumer or shareholder, or as a useful source of management support to the regulatory limitations inherent in a natural monopoly.

Despite the findings, some limitations should be considered with regard to this research: the fact that we worked with a non-probabilistic sample, which means that the results are valid only for the sample studied and the inherent inferences are restricted to the group in question. The quantitative analysis involved only modern artifacts. Therefore, caution is recommended with regard to the extrapolation of the research findings and also with regard to comparisons with other studies related to the use of management accounting artifacts.

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The relevance of the fair value of derivatives in financial institutions after the adoption of IFRS

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Abstract

Objective: This study analyzes whether the change in the fair value of derivatives, associated with the adoption of IFRS, has an impact on the market value of Brazilian and global financial institutions in the period between 2005 and 2015.

Method: The research is empirical-analytical and, for the analysis of the proposed models, we used the panel data technique and performed fitness tests for the sake of better estimation. The 20 Brazilian financial institutions with shares traded on BM&FBOVESPA were selected. For the other countries, the institutions in the *Bloomberg* database were analyzed, totaling 140 jurisdictions and 1,853 financial institutions.

Results: The results showed that it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, affects the market value of Brazilian financial institutions. For the global sample, a relevant relationship was found, at the level of 10%, and it can be stated that the change in the fair value of derivatives, associated with the adoption of IFRS, affects the market value of global financial institutions.

Contributions: This study contributes to an understanding of the role of derivatives and the adoption of IFRS in the market value of Brazilian and global financial institutions, which is relevant given their importance and associated risks.

Key-words: derivatives, international accounting, IFRS, accounting information.

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1. Introduction

In 2008, Brazil and the world were the stages for some of the most serious cases of misuse of derivative financial instruments. The companies that most suffered from the consequences of this use include Sadia and Aracruz Celulose in Brazil, which are important companies in the Brazilian capital market. According to a Relevant Fact disclosed by Sadia S.A. on September 25, 2008, the company estimated losing around 760 million reais due to the settlement of foreign exchange derivative positions. Similarly, on November 3, 2008, Aracruz Celulose S.A. disclosed estimated losses up to that moment equal to 2.13 billion dollars with the liquidation of the same type of operations. The losses were so severe that the companies were later incorporated and today are no longer traded on the stock exchange in their original form.

According to the *Bank for International Settlements* (BIS), (2009), the sharp currency devaluation observed in Latin America after mid-September 2008 resulted in large losses for some of the largest companies in Brazil and Mexico. In Mexico, losses with derivatives reached 4 billion dollars in the fourth quarter of 2008 while, in Brazil, where official values have not yet been released, the expected losses amount to at least 25 billion dollars.

In addition to the great losses that occurred in the Latin American derivatives market during the 2008 crisis, other financial "catastrophes" had already occurred due to the improper[1] use of these instruments since the 1980s. According to Hull (2016), in 1995, the operations of Nick Leeson overthrew a 200-year-old British bank, Barings; in 1994, the operations of Robert Citron led Orange County, a city in California, to lose about 2 billion dollars. John Rusnak's U$ 700 million losses for Allied Irish Bank became known in 2002. In 2006, the Amaranth *hedge fund* lost U$ 6 billion due to the risks of the operations carried out by Brian Hunter. In 2008, Jérôme Kerviel lost more than 7 billion dollars trading stock exchange index futures for Société Générale. The huge losses of UBS, Shell and Sumitomo also resulted from the activities of a single individual.

Lima and Lopes (2001) highlight that the increase in operations using these financial instruments, associated with crises of internationally renowned institutions, put these products under the scrutiny of financial institutions and regulators around the globe. All these losses cannot be considered a rule against the entire derivatives system though. This is a market that trades amounts exceeding trillions of dollars and caters very well to the needs of those who use them properly. Reports of disastrous operations are but a small portion of operations involving these instruments, but they nevertheless need to be treated with special attention (Hull, 2016).

Allayannis and Weston (2001) found significant evidence that the use of derivative contracts for the purpose of *hedging*, and not speculation, can motivate an increase in the company value, as this strategy is used to mitigate risks inherent to the business and thus minimize the volatility of the company's income.

1 ". . . derivatives can be used for *hedge* or for speculation. In other words, they can be used to reduce risks or to take them. Most losses occurred because the derivatives were misused." (Hull, 2016, p. 884)

Therefore, from the perspective of *value relevance*, movements in the fair value of derivatives, as well as their purpose, which is directly associated with the risk of operations, can constitute a relevant value, that is, their fluctuations can affect the companies' market value. According to Scott (2012), there are some reasons that may justify the change in investor behavior that comes from reactions to the accounting data that companies disclose. These reasons include the fact that market agents hold expectations regarding the future performance of the company and the accounting data are a source of information to estimate this performance. In addition, the disclosure of accounting information may affect these agents' expectations if they differ from their projections. Investors also review their expectations and assess risks in addition to earnings projections. Lopes and Walker (2012) found this relationship for accounting figures in Brazilian companies. The change in the value of fixed assets affected not only the stock price of the investigated companies but also their returns in the pre-adoption period of IFRS in Brazil.

In addition, the adoption of IFRS by financial institutions around the world may have provided better quality information about the derivatives and, thus, may assist the information users' decision-making and the better risk perception of these institutions. Van Tendeloo and Vanstraelen (2005) list the benefits of adopting IFRS as the ability for investors to make better informed financial decisions, which ultimately results in reduced company risk and lower cost of capital.

One can note, however, how catastrophic the use of derivative instruments can be without proper planning, knowledge and governance mechanisms. The result could be even more relevant if companies whose financial statements contain a significant share of financial instruments misused them, which could happen to banks. The mismanagement of these instruments in a highly volatile macroeconomic scenario can generate such large losses that they are capable of putting the global financial system at risk. Nevertheless, it is expected that institutions with greater experience in operations involving derivative financial instruments (about 75% of all derivative transactions in the world in 2015 were carried out by financial institutions, according to data from BIS, 2016) have a greater and better structure to manage such operations and are not that exposed to risks of significant losses.

Therefore, the main motivation of this research is the importance of income from derivatives for financial institutions and how sensitive these results can be to market fluctuations.

Based on the context explained above, this study aims to analyze whether the change in the fair value of derivatives, associated with the adoption of IFRS, has an impact on the market value of Brazilian and global financial institutions.

In this sense, the research hypothesis is that the change in the fair value of derivatives, associated with the adoption of IFRS, has a significant (relevant) impact on the market value of financial institutions.

This study aims to contribute to an understanding of the role of derivatives and the adoption of IFRS in the market value of Brazilian and global financial institutions, which is relevant given their importance and associated risks. In addition, the specific analysis of Brazilian banks permits exploring a sector usually excluded from research, because it has very peculiar characteristics, allowing us to identify the relevance of both the fair value of derivatives and the adoption of IFRS for these institutions.

The results showed that, for the Brazilian sample, the research hypothesis was weakly accepted, given that the interactive variable *IFRS X Der* in the complete model was significant, but with an immaterial coefficient. Hence, it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, has an impact on the market value of Brazilian financial institutions. This result can be explained by the fact that the Brazilian standard for financial institutions already considered fair value aspects and broad dislosure of derivative and financial *hedging* instruments long before the convergence. For the global sample, the results evidenced, at a 10% significance level, that the research hypothesis was accepted, given that the interactive variable *IFRS X Der* in the complete model was significant with an expected coefficient and sign, i.e., it can be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, negatively affected the market value of the global financial institutions. This result may be related to the increased volatility of the companies' income after the adoption of IFRS, resulting from the variation in the fair value of the derivatives.

2. Theoretical Platform

2.1 International Financial Reporting Standards – IFRS

The adoption of IFRS is one of the ways to break the information asymmetry and improve the accounting information because, through this GAAP, the information becomes more detailed and gains quality and, thus, favors the decision-making of economic agents.

In this sense, Barth, Landsman and Lang (2008) concluded in their research that companies that adopted IFRS improved the quality of their accounting information and provide greater relevance to their results. Thus, the authors attributed these facts to the better quality of financial reporting provided by the adoption of IFRS. For Byard, Li and Yu (2011), the adoption of IFRS has improved the environment for market analysts, as better quality information can provide more accurate recommendations from these professionals.

For Daske, Hail, Leuz and Verdi (2008), the effects of the adoption are stronger in countries where the differences between local GAAP and IFRS are greater. In addition, we note the lack of research that considers Latin American companies, which represents one of the contributions of this study.

In Brazil, the convergence with the International Financial Reporting Standards was achieved by the publication of Law 11.638 on December 28, 2007. Moreover, convergence in Brazil did not happen as harmoniously for financial institutions as in European countries, despite the fact that the Brazilian Central Bank was one of the first Brazilian institutions to manifest interest in the conversion. The Brazilian regulatory characteristic (*civil law*) made the process long and bureaucratic for non-financial companies and, for financial companies, there was an aggravating factor: the Central Bank did not permit the full adoption of IFRS and the entities under the supervision of this body have not yet fully converged, although they are also required to disclose in IFRS. Bacen has not yet adopted some standards and, therefore, the financial institutions use their own GAAP, which combines IFRS principles and specific instructions issued by the regulator (Cosif).

According to Lima (2016), the Brazilian institutional environment poses challenges to the existence of the economic benefits associated with the adoption of IFRS: (i) legal tradition based on *code law*, which is characterized by the active participation of the State in the accounting standardization process, which contributes to a less transparent environment; (ii) the low legal *enforcement*; (iii) companies using private and subsidized financing, as opposed to public issue markets; and (iv) accounting standards historically related to fiscal determinations (at the start of the transition period to the IFRS); and (v) poor protection of creditors (Araujo & Funchal, 2009); and (vi) inefficiency of the justice system (Anderson, 1999).

2.2 Derivative Financial Instruments

The origin of the derivatives is uncertain, but it is believed that they arose even in antiquity due to the need to speed up and enhance the safety of commodity trading. These instruments were created as risk transfer agreements without the transfer of the main asset (Carvalho, 1999).

In their modern form, derivatives are the financial instruments created to mitigate risks and have represented an important evolution in the capital market. Nevertheless, their use goes far beyond the containment of risks by market agents, and can also be used to take risks, which flees from their original proposal.

According to Souza (2014), derivatives are the most used tools by companies for the management of their financial risks. They play a role far beyond risk mitigators though, and may be the very source of risk.

Financial institutions, in particular banking institutions, are exposed to various financial risks due to the nature of their operations. To manage these risks, the banks use derivative financial instruments, which are considered the most efficient tools for this end. In addition to using derivatives to reduce exposure to financial risks, institutions can also conduct arbitrage and speculation operations with these instruments (Venkatachalam, 1996).

For the large investor Warren Buffet, derivatives are a weapon of mass destruction, but they have great utility to protect companies against financial risks if used intelligently (personal communication, June 17, 2015)[2]. The clever use cited by Buffet could be translated as the use of derivatives for *hedging* structures, which would be done to reduce the volatility of the company's results, and not for leverage and exposure to risks as would happen in speculation strategies.

According to Hull (2016), speculation with derivatives gives life to the market, but it must be done by companies constituted for this purpose, never by companies active in the real economy.

From the companies' perspective, in particular financial institutions, the accounting records of derivative financial instruments should always be registered at their fair value. In this respect, IAS 39, IFRS 9 and Bacen Circular Letter Nr. 3.082/2002 (which represented a significant change at the time) do not present divergences in the treatment. All of the above standards stipulate that these instruments have to be recorded in the companies' balance sheets at their fair value. For Souza (2014), however, the fair value record is not sufficient to show the risks associated with these instruments.

Derivatives can be assets or liabilities for the institutions, depending on their fair value, and their income can be accounted for in a specific line in the income statement for the year (DRE) or in the balance sheet, if they are accounted for as *hedge accounting*, reducing the volatility of the company's income and eliminating the accounting asymmetry of the net equity[3] (Chiqueto, 2014). Not every *hedge* can be accounted for as *hedge accounting* though. To receive the *hedge accounting* treatment, the operation needs to comply with the requisites of the standard. In addition, the entity may choose not to designate the derivatives as *hedge accounting*. In this case, the risks are protected, but the volatility remains in the income.

Thus, derivatives that are not designated for *hedge accounting* are accounted for in the same way as derivatives for the purpose of speculation (Chiqueto, 2014).

2 Note: In an interview with AFRWeekend on June 17, 2015, Warren Buffet described derivatives as "*weapons of mass destruction*" and further completed: "*derivatives, lend themselves to huge amounts of speculation*". . . "*That does not mean they cannot be used intelligently. We use them in our utility operation in terms of hedging input costs, for some short term contracts, converting fixed to floating rates for fixed income investments and foreign exchange, they serve a useful purpose but do have that mass destruction potential*".

3 Accounting asymmetry: asset object affects the NE and the corresponding derivative affects the income.

Hedge accounting is an optional practice and both IAS 39 and the Central Bank Standard require restrictive conditions for its adoption. According to Chiqueto (2014), entities need incentives for this accounting choice. One such incentive may be the intention to eliminate volatility from the income to increase the price of the company's shares. Another reason may be the favoring of analysts ' expectation to avoid negative stock price reactions.

Nevertheless, one can realize how sensitive the companies' income can be to the choices involving derivatives, whether to take risks or even to protect themselves against risks and prevent this from affecting their income. Therefore, this research aims to seek evidence that this important line in the financial statements can influence the market value of banks in Brazil and the world, that is, the derivatives are expected to be a relevant value.

2.3 *Value Relevance* and Derivatives

Accounting information, when relevant, can change the beliefs of economic agents and thus influence the market value of companies, as this information can give signals about the future economic benefits these agents may have access to (Almeida, 2010).

According to Ohlson (1995), accounting information is relevant to determine the company value, and some relevant value events can affect expected future income as opposed to the current income, that is, accounting values incorporate some relevant value events only after a time interval.

In addition, for Barth, Beaver and Landsman (2001), a book value is considered relevant if it associates a prediction with market values. In addition to defining the relevance of accounting information for the company's market value, Dalmácio, Lima, Martins, and Rezende (2011) argue that the initial milestone of research on the role of accounting information in capital markets was the work of Ball and Brown (1968), in which they investigated the existence of the relationship between accounting profit and stock price and verified that the accounting figures were able to offer information to the capital market. Beaver *et al*. (1979), based on the studies of Ball and Brown (1968), found a positive correlation between changes in accounting income and stock prices.

In this context, accounting information is extremely important, given that accounting is an instrument for breaking information asymmetry between the market agents (managers, investors, analysts, creditors, regulators, among others) (Scott, 2012).

According to Lima (2013), accounting information is one of the main mechanisms for breaking the information asymmetry and contributes to the investors' decision-making process. This happens when one party has more access to information than the other and this leads to increased risk, influencing the probability of losses for this investor.

According to Silva (2013), the adoption of IFRS enabled an increase in the informational content and this fact is useful for analysts, shareholders, regulators, and executives. Particularly the analysts play an important role in the capital market, as they provide information on the performance of the companies they monitor, which may contribute to reducing the information asymmetry between the agents. When the IFRS were adopted, these professionals gained access to more useful accounting information for their forecasts, as the level of disclosure increased, also according to Silva (2013). In this context, investors gained access to more accurate and therefore more useful forecasts in the decision-making process.

In addition to profit, accounting data, such as the income from derivatives, can influence the market value of the company, as operations with these instruments represent a challenge for accounting itself (Lima and Lopes, 2001) and can significantly affect the company's profit (Galdi and Pereira, 2007). In their research, Koonce, Miller, and Winchel (2015) found that choices involving derivatives in a company and their regulation influence investors' reactions.

The fair value accounting of derivative financial instruments is an important foundation of IFRS, but it may be related to the increased volatility of the companies' income and this may represent a risk to investors, which could affect the market value of these companies (Chiqueto, 2014).

Venkatachalam (1996) verified the usefulness of derivative instruments in the banks' risk management and found that changes in the fair value of these instruments help explain changes in the companies' market value. In addition, the author found that, on average, banks use derivatives to reduce the risk of items on their balance sheets, but a significant number of institutions may have used these instruments to take additional risks, rather than reduce the risk through *hedging* strategies.

Changes in the companies' market value may be associated with the market agents' perceived risk and this risk may be associated with the volatility of the companies' income. Some studies appoint that profit volatility is negatively associated with companies' market value, such as Allayannis and Weston (2001).

2.4 Aspects of Basel III on Risk and Derivatives

One of the biggest financial events of recent decades, the global financial crisis (or *sub-prime* crisis) brought to the foreground an issue of extreme relevance for the capital market: the importance of financial institutions and the consequent need for proper management of their financial instruments, especially derivatives.

According to Hellmann, Murdock and Stiglitz (2000), over the past two decades, the frequency of banking system crises has been growing significantly, and these crises are important not only for the devastation they cause in a particular institution, but throughout the economy. Prudential regulation (Basel agreements) is intended to protect the global banking system against this type of problem.

In his work, Moshirian (2011) cites the role of the *sub-prime* crisis as a trigger for the profound changes in the financial sector in the world, especially with regard to the regulation and monitoring of risks inherent in the sector.

In response to these institutions' fragility in the face of the crisis, the BIS has developed a new set of capital and risk requirements, through the Basel Committee, for banks around the globe. This new phase of the Basel requirements became known as the Basel III Agreement.

This agreement is a set of new measures to strengthen the regulation, supervision, and risk management of the global banking sector. The new measures basically aim: to improve the ability of the financial sector to absorb shocks arising from economic stress; to improve risk management and governance and to strengthen the transparency of the sector's disclosures (BIS, 2015). For Bacen (2017), Basel III is intended to improve the ability of financial institutions to absorb shocks.

For Stiglitz (1993), regulation can present positive aspects for the market, reducing the possibility of events that could compromise the stability of the financial system, if it is well planned.

3. Method

3.1 Sample

Financial institutions from several countries were selected for the study. The Brazilian sample consists of the 20 financial institutions with shares traded on BM&FBOVESPA, from 2005 to 2015. The mandatory disclosure in IFRS by these institutions began in 2010. Thus, the period permits an analysis of the derivatives' *value relevance* before and after the institutions' adoption of the IFRS. The data were collected in the Bloomberg database, in Explanatory Notes to the financial statements published by the institutions available on the BM&FBOVESPA website and in the IR of each company. All the financial data of the banks in the Brazilian sample were collected in *reais*.

For the other countries, the world banks present in the *Bloomberg* database were analyzed with data referring to the period from 2005 to 2015. The period was chosen due to the deadline for the adoption of the International Financial Reporting Standards (IFRS) by most countries. All financial data were collected in dollars for the banks of the world sample. Financial institutions from 140 jurisdictions were analyzed, totaling 1,853 financial institutions.

The segregation into two samples (Brazilian banks and banks from other countries) aims to verify whether the change in the fair value of the derivatives linked to the adoption of IFRS is relevant specifically for the financial institutions in Brazil compared to those of other countries.

3.2 Model and Variables

This theoretical-empirical research uses the multivariate panel data analysis technique with robust errors for all models. In addition, Chow's F-test, the Breusch-Pagan and the Hausman test were performed to verify the fitness of these models.

As this is a *value relevance* study, the impact of the accounting variables Earnings per Share (EPS) and Book Value per Share (BVPS) on the Stock Price (P) of the financial institutions in the sample was investigated. To assess the derivatives' relevance, as well as the impact (relevance) of the adoption of IFRS, the change in the Fair Value of these instruments (*Der*) and the *dummy* variable for the adoption of IFRS were considered for the institutions of the two samples. To assess whether the change in the fair value of the derivatives associated with the adoption of IFRS (joint analysis) is relevant, the interaction of the two variables *Der* X IFRS was considered.

The breakdown of each variable can be checked in Table 1 below.

Table 1
Research Variables

Variable	Symbol	Definition	Expected Sign	Source Brazil/World	Authors
		Dependent			
Price	Price	Quote of Main Asset on Local Exchange in reais/dollars	+	Bloomberg	Collins, Maydew, and Weiss (1997)
		Independent			
Earnings per Share	EPS	Net Profit divided by the amount of outstanding shares	+	Bloomberg	Collins, Maydew, and Weiss (1997)
Net Equity per Share	BVPS	Average Net Equity divided by the amount of outstanding shares	+	Bloomberg	Collins, Maydew, and Weiss (1997)
Δ Fair Value of Total Derivatives	Der	Δ Fair Value of Total Derivatives ((Result with Derivatives)$_t$ - (Result with Derivatives)$_{t-1}$)	-	Explanatory Notes/ Bloomberg	Allayannis and Weston (2001)
IFRS	IFRS	Accounting system used for the production of information (*dummy* 1 for IFRS and 0 for other systems)	+	Explanatory Notes/ Bloomberg	Barth, Landsman and Lang (2008)
IFRS X Δ Fair Value of Total Derivatives	IFRS X Der	Interactive Variable	-	Calculated	Allayannis and Weston (2001)
		Control			
Firm Size	Siz	ln (Total Assets)	+	Bloomberg	Collins, Maydew, and Weiss (1997)
Basel index	Basel	Capital Index	+	Bloomberg	Scott (2012).
Monitoring by Analysts	Analysts	Number of analysts monitoring the company	+	Bloomberg	Carrete, Tavares and Yamaguchi (2014)
Crisis	Crisis	Sub-prime financial crisis (*dummy* 1 for the year 2008 and 0 for the remaining years of the samples)	-	Carvalho, Flores, Silva and Weffort (2016)	Carvalho, Flores, Silva and Weffort (2016)
Common Law Legal System	ComL	Legal System based on Common Law classification (*dummy* 1 for Common Law)	+	Does not apply/ JuriGlobe (2015)	Ali and Hwang (2000)
Civil Law Legal System	CivL	Legal System based on Civil Law classification (*dummy* 1 for Civil Law)	-	Does not apply/ JuriGlobe (2015)	Ali and Hwang (2000)
Mixed Law Legal System	MixL	Legal System based on Mixed Law classification (*dummy* 1 for Common Law and 0 for Civil Law)	-	Does not apply/ JuriGlobe (2015)	Ali and Hwang (2000)

Obs.: prepared by the authors.

Based on the models proposed by Venkatachalam (1996), Collins, Maydew and Weiss (1997) and Barth, Beaver and Landsman (2001), the panel data analyses for the Brazilian and global banks were developed based on the following equation:

$$P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \beta_5 (IFRS_{it} \times Der_{it}) \sum_{1}^{n} \beta_n \, Controle_{it} + \mu_{it} \qquad (1)$$

Where:

- P_{it} = Closing Price of company i's Stock on the Local Exchange at the end of year *t*.
- EPS_{it} = Earnings per Share of company *i* in year *t*.
- $BVPS_{it}$ = Book Value per Share of company *i* in year *t*.
- Der_{it} = Variation in the Fair Value of company i's Total Derivatives in year *t*.
- $IFRS_{it}$ = *Dummy* variable for IFRS Adoption in company *i* in year *t*.
- $IFRS_{it}$ x Der_{it} = Interactive variable of IFRS adoption and Variation in the Fair Value of company i's Derivatives.
- *Control* = Firm Size, Basel Index, Monitoring by Analysts (number of analysts monitoring the company), and Crisis at time *t*. Additionally, for the global banks, the legal system (*Civil Law*, *Common Law* and *Mixed Law*) was considered.

According to Collins, Maydew, and Weiss (1997), some of the changes in firm value are due to variations in the company size over time. Another control variable of the model is the Basel Index, which represents the banks' degree of leverage. This variable was used because investors adjust their expectations to risk and the Basel index was used as a measure of this risk for financial institutions (Scott, 2012).

In addition, monitoring by analysts was used, because the analysts' recommendations may influence the market value of the companies that are more monitored, given that the market can react to their recommendations, taking into account that these agents act to increase the market efficiency (Carrete, Tavares & Yamaguchi, 2014).

Another important point was to consider the global financial crisis as a *dummy* variable for the year 2008, the summit of the crisis, to isolate the effects this event brought about for the companies' value. According to Carvalho, Flores, Silva, and Weffort (2016), the year 2008 represented a period of macroeconomic crisis, with a strong impact on the world economy after the news on the collapse of the bank Lehman Brothers.

For the world model, in addition, the legal system the companies are exposed to in their country of origin was considered. Taking into account that the regulatory environment significantly influences corporate governance, Goldschmidt, Licht, and Schwartz (2005) suggest that each country's legal standard may have an impact on the trajectory of governance systems and that, depending on the legal system, some countries tend to protect investors more and others to protect creditors more. Bushman and Smith (2003) state in their survey of studies involving the relevance of accounting information and corporate governance that *Common Law* countries are often *market-oriented* and offer high protection to non-controlling shareholders. In contrast, *civil law* countries are *bank-oriented* and offer low protection to non-controllers. In addition, Ali and Hwang (2000) concluded that *bank-oriented* countries present less relevant accounting reports than *market-oriented countries.* Therefore, we will analyze the type of legal system in each country where each institution is located, considering the classification of legal systems by *JuriGlobe - World Legal Systems* (research group of Law professors from the University of Ottawa), classified into *Civil Law* (or *Code Law*), *Common Law*, *Muslim Law*, *Customary Law* and *Mixed System*.

To verify the results, the following models were tested, based on the baseline *value relevance* model and the progressive inclusion of the variables proposed in this study, according to Table 2, as follows:

Table 2
Multivariate Models

Model	Type	Brazil Effect	World Effect
Model 1	Baseline	Fixed	Random[1]
Model 2	Der	Fixed	Fixed
Model 3	Der + IFRS	Random[1]	Fixed
Model 4	Der x IFRS (Interactive)	Random[1]	Fixed
Model 5	Complete (Includes Controls)	*Pools*[2]	Random[1]

Obs.: considers the Result of each bank's total derivatives.
[1] With robust errors, random effects were more appropriate, as the Hausman test showed no significance. In addition, with fixed effects, the dummy variable "IFRS" would be excluded.
[2] The F tests of Chow and Breusch-Pagan demonstrated *Pools* as the best model specification.
Description of the models used:

Model 1: $P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \mu_{it}$

Model 2: $P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \mu_{it}$

Model 3: $P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \mu_{it}$

Model 4: $P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \beta_5 (IFRS_{it} \times Der_{it}) + \mu_{it}$

Model 5: $P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \beta_5 (IFRS_{it} \times Der_{it}) + \beta_6 Tam_{it} + \beta_7 Analise + \beta_8 Basel_{it} + \beta_9 Crise_{it} + \mu_{it}$

Model 5 (world): $P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \beta_5 (IFRS_{it} \times Der_{it}) + \beta_6 Tam_{it} + \beta_7 Analise + \beta_8 Basel_{it} + \beta_9 Crise_{it} + \beta_{10} ComL_{it} + \beta_{11} CivL_{it} + \mu_{it}$

Model 1 is in accordance with the *Value Relevance* literature. In Model 2, the Result of Total Derivatives was added to analyze whether derivatives have relevant information content(*value relevant*), that is, whether it affects the market value of financial institutions, in addition to the variables of the Baseline Model. In Model 3, the *dummy* of the IFRS adoption was included to verify the relevance of the entry of the new accounting model in the results, that is, if the adoption of IFRS impacts the institutions' market value. In addition, Model 4 considers the interactive variable (IFRS X Change in the fair value of derivatives) to verify the relevance of the interaction of IFRS adoption and the Fair Value of Derivatives in the market value of those institutions. In Model 5, the Full model is considered, with the inclusion of control variables.

4. Results

4.1 In Brazil

The results presented in section 4.1 were obtained from the analysis of the sample of banks in the world between 2005 and 2015, based on the models presented in section 3.2.

The descriptive statistics of the variables used are presented below.

Table 3
Descriptive statistics of model variables in Brazil

Variable	Obs	Mean	Standard Deviation	Minimum	Maximum
Price	173	11.78	9.20	0.13	34.48
EPS	190	1.87	2.99	(9.40)	21.43
BVPS	189	11.27	13.34	0.22	131.78
Der	162	(196.593)	2,872,624	(22,800,000)	10,100,000
Size	207	9.48	2.21	3.99	14.15
Analysts	142	7.94	7.62	–	23
Basel	187	0.18	0.05	0.05	0.38

We can perceive the limited availability of data from the number of observations. In addition, the behavioral range of the *Der* shows how these values can be volatile, demonstrated by the high standard deviation. Despite a high standard deviation and great range for the variable of interest, outliers were not treated for the Brazilian sample, due to the limited availability of data.

The Pearson correlation table of the variables is presented below.

Table 4
Correlation of the Variables of the General Model in Brazil

Variable	Price	EPS	BVPS	Der	IFRS	Size	Analysts	Basel	Crisis
Price	1								
EPS	0.6509	1							
	0***								
BVPS	0.6676	0.5969	1						
	0***	0***							
Der	-0.0906	-0.0268	-0.0104	1					
	0.3071	0.7575	0.905						
IFRS	0.1049	0.1523	0.1818	-0.1482	1				
	0.1697	0.0359**	0.0123**	0.0598*					
Size	0.5999	0.1123	0.1125	-0.1387	0.1987	1			
	0***	0.124	0.1234	0.0872*	0.0041***				
Analysts	0.8054	0.6055	0.1672	-0.1198	0.2798	0.8523	1		
	0***	0***	0.0634*	0.1664	0.0007***	0***			
Basel	-0.0389	0.1709	0.0515	0.0635	-0.1337	-0.1106	-0.1936	1	
	0.6283	0.0254**	0.5039	0.4597	0.0681*	0.1318	0.0292**		
Crisis	-0.204	-0.0259	-0.0794	0.0158	-0.3464	-0.0099	-0.0169	0.0568	1
	0,0071***	0.7227	0.2776	0.8414	0***	0.8871	0.8414	0.44	

* 10% significance, * * 5% significance, * * * 1% significance

All correlations were calculated considering the entire time series. Although the correlation matrix expresses the linear relationship between the variables of the models, this analysis does not exhaust the measure of influence among them. This does not guarantee either that the signs of the correlations are maintained in the multivariate analysis.

We can observe the positive correlation between the variables *EPS* and *BVPS* and the *Price* of the banks in the sample, indicating how these values can be Relevant Values. In addition to these, the *Size* of the company and the number of analysts who monitor it also showed a considerable correlation with the *Price*. The Financial *Crisis* of 2008 also showed influence on the *Price*. The variable of interest *Der* showed no significant correlation. The adoption of *IFRS*, then, was correlated with *EPS* and *BVPS*, which may indicate changes in these values after the adoption. There was no influence on the *Price* in the correlation matrix though.

4.2 Multivariate Models

The results of the analysis are presented in Table 5 below.

Table 5
Results of the Model in Brazil

Variable	Fixed 1	Fixed 2	Random 3	Random 4	Pols 5
	0.5771	0.2438	0.7101	0.6870	0.3490
EPS	0.4679	0.2214	0.3927	0.4084	0.6681
	0.2352	0.2883	0,0706*	0,0925*	0.6117
	0.3546	0.2665	0.4787	0.4597	0.2497
BVPS	0.1610	0.1505	0.1221	0.1225	0.2120
	0.0426**	0.0968*	0.0001***	0.0002***	0.2636
		-0.0000	-0.0000	0.0000	0.0000
Der		0.0000	0.0000	0.0000	0.0000
		0.0361**	0.0001***	0.0003***	0.0003***
			-1.7284	-1.4949	-3.2861
IFRS			0.8766	0.8639	1.1424
			0.0486**	0.0835*	0.0151**
				-0.0000	-0.0000
IFRS X Der				0.0000	0.0000
				0***	0.0003***
					1.4924
Size					0.5063
					0,0133**
					0.4028
Analysts					0.1223
					0.0072***
					16.9009
Basel					9.3882
					0.0993*
					-6.6141
Crisis					1.0629
					0.0001***
	7.2879	9.1924	7.1940	7.1329	-10.2280
Constant	1.6662	1.3887	1.7282	1.6984	5.7578
	0.0005***	0***	0***	0***	0.1033
N	165	122	122	122	95
R^2	0.1416	0.0834	–	–	0.8310
R^2 *overall*	0.5346	0.2930	0.3453	0.4229	–
R^2 *between*	0.7299	0.5071	0.6074	0.6832	–
R^2 *within*	0.1416	0.0834	0.0758	0.0945	–
F	3.1804*	7.0292***	–	–	739.2860***
χ^2	–	–	68.4506***	237.9121***	–

* 10% significance, * * 5% significance, * * * 1% significance
1st line of the variable: coefficient
2nd line of the variable: standard error
3rd line of the variable: *p-value*

The obtained results confirm the *value relevance* literature for the Baseline Model, as *BVPS* was significant and positively related to the *Price*. This relationship loses relevance though when all variables (including controls) are added.

All variables of interest were significant and related to the *Price*. The coefficients are very small though. The *Der* variable exerted a neutral influence on the Price (when the coefficient was observed). The model presents this variable as significant and positively correlated with the Price though. This result can be considered an indication that Brazilian banks use derivatives to reduce risk (Venkatachalam, 1996), reducing the profit volatility (Allayannis and Weston, 2001).

The adoption of *IFRS* had a negative and relevant influence on the *Price*, corroborating Lima (2016), in that the Brazilian institutional environment imposes challenges on the existence of economic benefits associated with the adoption of IFRS. Another important point to consider is that the Central Bank has not yet permitted the full adoption of IFRS by financial institutions, causing these institutions to use their own GAAP, which combines the IFRS principles and specific instructions issued by the regulator.

Analysts and *Size* exert great influence on *Price* and *Crisis* exerted negative influence on the Price, as expected. *Basel* also presented a significant value coefficient on the *Price*, which can signal that investors are risk-averse.

Analyzing the interaction between *IFRS* x *Der*, a neutral influence on the Price is verified (when the coefficient is observed), although the model presents this variable as significant and negatively correlated with the Price, as expected. This relationship can be explained by the fact that the Brazilian standard for financial institutions already considered fair value aspects and broad evidence of derivatives and financial *hedging* instruments long before the convergence. This confirms the assertion by Daske Hail, Leuz, and Verdi (2008) that the effect of the IFRS adoption is greater in countries whose local GAAP are more distant from IFRS.

Overall, the research hypothesis was weakly accepted for the Brazilian sample, given that the interactive variable *IFRS X Der* in the complete model was significant, but with an immaterial coefficient, that is, it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, influenced the market value of the Brazilian financial institutions.

4.3 In the World

The results presented in section 4.3 were obtained from the analysis of the sample of banks in the world between 2005 and 2015, based on the models presented in section 3.2.

In Table 6, below, the Descriptive Statistics of the variables used in the global sample are shown:

Table 6
Descriptive Statistics of the Variables in the Global Model

Variable	Obs	Mean	Standard Deviation	Minimum	Maximum
Price	15.471	1.61	1.70	-2.09	6.32
EPS	14.030	-0.42	1.29	-3.05	2.63
BVPS	13.268	8.42	0.03	8.41	8.70
Der	1.575	2.41	2.32	-2.23	7.29
Size	15.792	7.41	2.24	2.47	13.04
Analysts	20.383	3.45	7.63	–	66.00
Basel[1]	11.552	0.011	0.79	-0.01	83.35

[1]Original data were used in the descriptive statistics before the treatment for outliers.

As noticed, much more data are available than the Brazilian sample but, for the data with Derivatives, the number of *missing values* is highly relevant. The irregular availability of data in the global sample is another limitation of this research. In addition, in view of the range of the behavior of the values and high standard deviations, treatments for outliers were performed in the global sample.

Table 7 below presents the Pearson's Correlation coefficients of the variables.

Table 7

Correlation of the Variables of the General Model in the World

Variable	Price	EPS	BVPS	Der	IFRS	Siz	Analysts	Basel	Crisis	Common Law	Civil Law
Price	1										
EPS	0.7024	1									
	0.0***										
BVPS	0.4079	0.4028	1								
	0.0***	0.0***									
Der	0.1896	0.2046	0.0042	1							
	0.0***	0.0***	0.8715								
IFRS	-0.0974	-0.014	0.0218	0.3321	1						
	0.0***	0.0969*	0.012**	0.0***							
Size	0.0423	0.0304	0.0195	0.3834	0.1452	1					
	0.0***	0.0***	0.025**	0.0***	0.0***						
Analysts	0.0232	0.0132	-0.0569	0.5527	0.1683	0.5137	1				
	0.0***	0.1178	0.0***	0.0***	0.0***	0.0***					
Basel	-0.0984	-0.1119	0.033	-0.0471	0.0987	-0.1068	-0.1007	1			
	0.0***	0.0***	0.0***	0.1183	0.0***	0.0***	0.0***				
Crisis	-0.0169	-0.0086	0.0057	0.0441	-0.0181	-0.0246	-0.0221	-0.0402	1		
	0.035**	0.309	0.5144	0.0805*	0.01***	0.0***	0.0***	0.0***			
Common Law	0.316	0.2233	-0.0672	0.2435	-0.4227	-0.2438	-0.104	-0.0999	0	1	
	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	1		
Civil Law	0.1882	0.1868	0.2153	0.234	0.3499	0.0549	0.0249	0.0519	0	-0.5277	1
	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	0.0***	1	0.0***	

* 10% significance, * * 5% significance, * * * 1% significance

The correlations of the variables of the global sample were also calculated considering the entire time series. This analysis does not exhaust the measure of influence between the variables either and this does not guarantee either that the signs of the correlations will be maintained in the multivariate analysis.

It can be observed that, like in the Brazilian sample, the variables *EPS* and *BVPS* are positively correlated with the *Price* for the sample banks, indicating that the values are Relevant Values. In addition, all other variables were largely correlated with the *Price*, including the *Der*.

The adoption of *IFRS* was correlated with *EPS*, *NES*, and *Der*. In addition, it exerted influence on the *Price*, which may signal that the adoption of *IFRS* affected the market value of the companies in the sample. The correlation was small and negative though.

It is important to emphasize that for the analysis of the Brazilian sample as well as for the world sample, we cannot accept or reject the research hypothesis based on the analysis of the correlation matrix only. This analysis is a step in the exploration of the data and is intended to signal the individual behavior and the linear relationship between the variables of the models.

4.3.1 Multivariate Models

The results of the analysis of the Model in the global sample are presented below.

Table 8
Results of the General Model in the World

Variable	Random 1	Fixed 2	Fixed 3	Fixed 4	Random 5
EPS	0.2999	0.1367	0.1356	0.1358	0.3778
	0.0125	0.0344	0.0343	0.0343	0.0349
	0.0000***	0.0001***	0.0001***	0.0001***	0.0000***
BVPS	5.7282	3.0582	3.0489	3.0402	9.9140
	0.9037	1.0096	1.0101	0.9976	2.2299
	0.0000***	0.0026***	0.0027***	0.0025***	0.0000***
Der		-0.0270	-0.0282	-0.0148	0.0744
		0.0148	0.0148	0.0170	0.0264
		0.0676*	0.0584*	0.3870	0.0049***
IFRS			0.1605	0.2427	0.2174
			0.1073	0.1325	0.1309
			0.1356	0.0678*	0.0969*
IFRS X Der				-0.0269	-0.0618
				0.0284	0.0328
				0.3443	0.0598*
Size					0.0243
					0.0154
					0.1157
Analysts					-0.0011
					0.0048
					0.8132
Basel					-0.0000
					0.0000
					0.9401
Crisis					-0.2785
					0.0847
					0.0010***
CivL					1.1049
					0.1420
					0.0000***
ComL					1.2007
					0.1883
					0.0000***
Constant	-46.5020	-24.0190	-24.0240	-23.9829	-82.9189
	7.6116	8.4988	8.5019	8.4007	18.8045
	0.0000***	0.0049***	0.0050***	0.0045***	0.0000***
N	10.903	1.293	1.293	1.293	924
R^2	–	0.0361	0.0383	0.0393	–
R^2 *overall*	0.5032	0.4904	0.4843	0.4745	0.6063
R^2 *between*	0.5912	0.5579	0.5377	0.5215	0.6261
R^2 *within*	0.0379	0.0361	0.0383	0.0393	0.0605
F	–	8.7708***	7.2686***	5.8838***	–
χ^2	689.7238***	–	–	–	519.3324***

* 10% significance, * * 5% significance, * * * 1% significance
1st line of the variable: coefficient
2nd line of the variable: standard error
3rd line of the variable: *p-value*

To mitigate the impact of the *outliers*, continuous variables were *winsorized* in their highest and lowest percentiles at 1%. In addition, for better estimation, the Box-Cox transformation was carried out (Fávero, 2016).

The obtained results confirmed the *value relevance* literature for the Baseline Model, as *EPS* and *BVPS* were significant and positively related to the *Price*. This relationship is maintained in all models.

All variables of interest were significant and related to the *Price*. The variable *Der* was significantly and positively correlated with the Price, presenting an inverse to expected sign. This result indicates that banks around the world have generally used derivatives to reduce the risk (Venkatachalam, 1996), reducing the profit volatility (Allayannis and Weston, 2001).

The adoption of IFRS had a positive influence on the *Price*, corroborating Barth, Landsman, and Lang (2008), who concluded in their research that companies that adopted IFRS improved the quality of their accounting information and provide more relevance to their results.

Crisis and the Legal model (*CivL* and *ComL*) influence the *Price* and the *Crisis* exerted a negative influence on the *Price*, as expected. *Basel* also presented a significant value coefficient on the *Price*, which can signal that investors are risk-averse.

Analyzing the interaction between *IFRS* x *Der*, a significant and negative influence on the Price is verified, as expected. This relationship may not be clear though, as *Der* presented a positive sign and the adoption of IFRS may have worsened its relationship with the *Price.* This result may derive from the fact that many countries are included in the global sample and the effect of adopting IFRS may be distinct in each legislation.

Thus, at a 10% significance level, the research hypothesis was accepted for the global sample, given that the interactive variable *IFRS X Der* in the complete model was significant with the expected coefficient and sign, i.e., it can be affirmed that the change in the fair value of the derivatives, associated with the adoption of the IFRS, negatively influenced the market value of the global financial institutions. This result may be related to the increased volatility of the companies' income after the adoption of IFRS, resulting from the change in the fair value of the derivatives, as explained by Allayannis and Weston (2001).

4.4 Summary of Results

In Table 9, a summary of the results can be observed, considering the research hypothesis for the samples in Brazil and worldwide.

Table 9

Summary of Results in Brazil and the World

General Model in Brazil				
$P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \beta_5 (IFRS_{it} \times Der_{it}) + \beta_6 Tam_{it} + \beta_7 Analise + \beta_8 Basel_{it} + \beta_9 Crise_{it} + \mu_{it}$				
Hypothesis	**Expected Sign of β[b]**	**Sign of β_5[b]**	***p-value***	**Result**
H_1	–	Null	0.0003***	Rejected
General Model in the World				
$P_{it} = \beta_0 + \beta_1 LPA_{it} + \beta_2 PLA_{it} + \beta_3 Der_{it} + \beta_4 IFRS_{it} + \beta_5 (IFRS_{it} \times Der_{it}) + \beta_6 Tam_{it} + \beta_7 Analise + \beta_8 Basel_{it} + \beta_9 Crise_{it} + \beta_{10} ComL_{it} + \beta_{11} CivL_{it} + \mu_{it}$				
Hypothesis	**Expected Sign of β[b]**	**Sign of β_5[b]**	***p-value***	**Result**
H_1	–	–	0.0598*	Not Rejected

For the Brazilian sample, the research hypothesis was weakly accepted, given that the interactive variable *IFRS X Der* in the complete model was significant, but with an immaterial coefficient, that is, it cannot be affirmed that the variation in the fair value of derivatives, associated with the adoption of IFRS, had an impact on the market value of the Brazilian institutions. For the global sample, the research hypothesis was accepted, at a 10% significance level, given that the interactive variable *IFRS X Der* in the complete model was significant with an expected coefficient and sign, i.e., it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, negatively impacted the market value of the global financial institutions.

5. Final Considerations

This study aimed to investigate the *value relevance* relationship of the fair value of derivative financial instruments and whether this relationship has changed with the adoption of International Accounting Standards for financial institutions in Brazil and worldwide.

Through empirical analysis, we sought to verify whether the change in the fair value of derivatives, associated with the adoption of IFRS, had an impact on the market value of Brazilian and global financial institutions. To estimate the models, the panel data technique was used and adequacy tests were performed for the sake of better inference.

For the Brazilian sample, the research hypothesis was weakly accepted, given that the interactive variable *IFRS X Der* in the complete model was significant, but with an immaterial coefficient. Hence, it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, has an impact on the market value of Brazilian financial institutions.

This result can be explained by the fact that the Brazilian standard for financial institutions already considered fair value aspects and broad evidence of derivatives and financial *hedging* instruments long before the convergence, confirming the statement by Daske, Hail, Leuz and Verdi (2008) that the effect of adopting IFRS is greater in countries whose local GAAP is further from IFRS.

Considering the Brazilian sample, the low availability of data in Brazil makes the empirical research difficult. The Brazilian capital market is still small and few companies are publicly traded, especially banks. Only 20 banks made up the sample, and the liquidity of the stock price of these banks is very low. Only 4 of these 20 banks are regularly traded.

For the global sample, the research hypothesis was accepted, at a 10% significance level, given that the interactive variable *IFRS X Der* in the complete model was significant with an expected coefficient and sign, i.e., it cannot be affirmed that the change in the fair value of derivatives, associated with the adoption of IFRS, negatively impacted the market value of the global financial institutions. This result may be related to the increased volatility of the companies' income after the adoption of IFRS, resulting from the change in the fair value of the derivatives, as explained by Allayannis and Weston (2001). Another point to consider for this result is that many countries are included in the global sample and the effect of adopting IFRS can be distinct in each legislation.

In addition, the results showed that, in general, Brazilian and global financial institutions have used derivatives to reduce risk (Venkatachalam, 1996), reducing profit volatility (Allayannis and Weston, 2001), as the change in the fair value of the derivatives (*Der*) was significantly and positively correlated with the market value of these institutions. Regarding IFRS, the results showed that the adoption of these standards by Brazilian financial institutions had a negative and relevant influence on the *Price*, indicating that the partial adoption of IFRS by financial institutions is translated as a synonym of risk, negatively affecting these institutions' market value, against expectations.

In short, we recognize both the empirical limitation of this work and its relevance. The research considering financial institutions is relevant and lacking treatment not only in Brazil and the results found show the importance of derivatives both for risk management and for the market value of these institutions. In addition, the investigation of the effects of financial instruments on the capital market is relevant given their importance and the associated risks. Another point to be highlighted is the inclusion of a new element to the *value relevance* literature, namely, the relationship of derivatives and the adoption of IFRS with company value. The topic can be deepened and treated with different approaches in future research. In addition, the limited treatment of the database may have compromised the analysis due to the high occurrence of *missing values*. This limitation suggests a continuation of the research with a data collection through the financial statements of banks around the world, instead of the use of databases for inference.

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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.
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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.

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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.

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1 Most of these guidelines were adapted from the Manual for Submissions of the *Revista de Administração Contemporânea* – RAC, available at www.anpad.org.br.

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