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Editor's Word

Dear reader, we are delivering the third issue of 2022. I want to inform and congratulate the authors of the papers published in this edition and thank all the authors who submitted their papers but were not approved. I would also like to welcome the new Editors: Professors José Renato from the State University of Feira de Santana and Renato Gurgel from the Federal University of Rio Grande do Norte.

In this issue, the first paper is written by Laís Vieira, Natália de Oliveira, Valéria Bressan, and José Francisco. Its objective was to investigate the determinants of income diversification in Brazilian credit unions. As a result, they report that the following were significant determinants of the diversification of credit unions: Return on Equity, Net Interest Margin, and General Expenses. Furthermore, the findings indicate that more profitable cooperatives are more likely to diversify; cooperatives would compensate for a decrease in their traditional sources of income with non-traditional ones; and that one of the consequences of increased operating expenses is greater diversification of revenues.

The second paper, written by Angélica Ferrari, Paulo Roberto da Cunha, and Jéssica Petri, analyzes the relationship between auditors' behavior in organizational conflicts and trust and cooperation between internal and external auditors. The results indicate that the factors guiding a decision to trust and cooperate can be interpreted differently between internal and external auditors, in addition to being influenced by characteristics such as age, gender, and the auditor's position. The results regarding the auditors' behavior in organizational conflicts show that most internal and external auditors present attitudes aimed at resolving conflicts. This profile of auditors positively influences trust and cooperation between internal and external auditing.

The third article is about a teaching case. It is written by Anderson Silveira, Luiz Aparecido Reis, Jailson Lana and Raul Partyka. This teaching case depicts a family's adverse financial situation when the provider must retire. Even though he had an excellent monthly income, because he never thought about the future and used all resources to meet immediate needs, he did not make arrangements to generate extra income to complement his retirement income. The case adopts a fictional and playful narrative and dialogues based on the authors' experiences, presenting real-world objectives and events. Thus, this case instigates and encourages readers to reflect on the importance of financial education, addressing all aspects involving earning income, saving, conscious spending, investments, and, finally, planning for the expected sustainable retirement.

The fourth article by José Glauber dos Santos, Alessandra Vasconcelos, and Márcia De Luca examines whether financial slack influences environmental spending among publicly traded Brazilian companies. The main results showed that financial slack based on cash and availability negatively affects environmental spending, and this relationship is somewhat persistent. Additionally, financial slack based on the comprehensive measure of the Kaplan and Zingales (1997) index positively affects environmental expenditures, though this relationship is not persistent.

The authors of the fifth paper are Andson Braga, Daniel Mucci, and Myrna Lima. This paper has a double purpose. First, the authors proposed a typology of quantitative empirical research in management accounting based on two design characteristics: the presence of a control group and sample representativeness. Second, the methods' implications were discussed, considering internal and external validity trade-offs.

The sixth article is written by Mara Jane Contrera Malacrida and Ariovaldo dos Santos. It aimed to verify to what extent the distribution of the wealth generated by the largest public and private companies operating in Brazil, from the main branches of economic activity, differs in terms of the tax burden, remuneration of capital (own and third parties), and employee remuneration from 1999 to 2018. The results indicate significant differences in the distribution of the wealth generated by the main branches of the economy (i.e., industry, trade, services, financial institutions, and insurance companies) for employees, shareholders, and creditors. This result was also verified in the proportion of the wealth assigned to the Government through taxes. This study's main contributions include a significant imbalance in the distribution of the wealth generated by the different branches of economic activity and that the industrial, trade and service branches bore a much higher tax burden than banks and insurance companies over the 20 years analyzed. This negatively impacted the amount these three branches distributed to employees and shareholders compared to banks and insurance companies.

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

Without further ado, I would like to thank all the researchers who submitted their papers to REPeC and the always collaborative referees. Congratulations to those who had their papers approved because the demand is quite high, and the road to the final publication is arduous.

Thank you, readers. I hope you will enjoy this new issue.

Academic greetings.

Gerlando Lima, Ph.D.
Editor in chief.

Determinants of revenue diversification in Brazilian credit unions

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Abstract

Objective: This study investigated the determinants of revenue diversification in Brazilian credit unions.

Method: A sample of 482 singular credit unions belonging to the Sicoob, Sicredi, and Unicred systems was addressed from 2009-2 to 2018-2. The factors determining diversification were obtained using a multiple regression model in two stages, estimated by the Systemic Generalized Method of Moments.

Results: Return on Equity, Net Interest Margin, and General Expenses appeared as significant determinants of diversification in credit unions. These findings indicate that more profitable cooperatives are more likely to diversify; cooperatives would compensate for a decrease in traditional sources of income with non-traditional incomes, and that greater revenue diversification may be one of the consequences of increased operating expenses.

Contributions: This study contributes to understanding which factors lead credit unions to adopt revenue diversification strategies, which increase their income from non-traditional activities; finding new sources of income may be important to increase an institution's general income.

Keywords: Financial Institution; Non-traditional activities; Credit operations

1. Introduction

The changes that have taken place in the Brazilian and international economic systems in recent years have impacted the way financial activities are developed. For example, Brighi and Venturelli (2016) draw attention to the deregulation of the banking sector, which resulted in an expansion in the scope of its activities and a change in revenue sources from traditional to non-traditional ones. At the same time, as financial institutions expanded, they also spread their operations across multiple geographic areas.

In addition to traditional bank lending, financial institutions can engage in non-traditional off-balance sheet activities, which may include: earnings and trading fees, banking investment and brokerage fees, net service fees, insurance commissions, net earnings on asset sales, fiduciary income, net securitization, service charges on deposit accounts, other foreign transactions, and interest-free income (Nguyen, 2012). Hence, non-traditional activities can be defined as non-interest income (Araújo, Comes & Guerra, 2011). Furthermore, since the financial sector is diversified, deregulation, technological advances, and consolidations provide a rich basis for research (Jouida & Hellara, 2018).

Studies also note that credit unions diversify by expanding products and services to keep their positions in financial markets (Esho et al., 2005), explore diversification opportunities (Goddard et al., 2008), access new income sources (Mathuva, 2016), obtain savings resulting from diversification, and promote the institutions' growth (Malikov et al., 2017). These factors motivate an interest in improving understanding of the process credit unions adopt to diversify financial products in Brazil.

The National Cooperative Credit System (SNCC) stood out due to its growth from 2016 to 2020 above the National Financial System (SFN). In this sense, the SNCC's adjusted total assets (ATA) went from R$174.3 billion in December 2016 to R$371.8 billion in December 2020, whereas its share in SFN's total assets went from 2.5% to 3.71% in the same period. At the same time, the SNCC's loan portfolio went from R$95 billion (2.74% of the SFN) to R$228.7 billion (5.1% of the SFN), resulting in an accumulated increase of 134.6% (Banco Central from Brazil, 2020a). Also noteworthy are the results of cooperatives in 2020, with a 4.6% increase in income from credit operations and an 18.4% growth in service revenues. This outstanding growth in service revenues is in line with an increase in the customer base, greater diversification of products and services, and greater dynamism of credit unions in the relationship established with their members (Banco Central do Brasil, 2020b).

Another interesting aspect of SNCC concerns the processes in which credit unions were merged, considering the main factor of a decreased number of cooperatives. Assets and operations and the cooperatives' membership are unified in a merger. Merger processes are expected to lead to efficiency gains, enabling more competently meeting the demands of associates, gains in scale, as well as an increase in the scope of products and services (Banco Central do Brasil, 2020b).

Thus, considering the importance of diversification strategies for financial institutions, including credit unions, researchers started investigating the factors that determine a diversification strategy (Ferreira & Braga, 2004; Pennathur, Subrahmanyam, & Vishwasrao, 2012; Nguyen, 2012; Cuong et al., 2020). In this sense, Nguyen (2012) emphasizes that a regulation aiming to limit banking activities may no longer be needed because having the liberty to offer varied services can help financial institutions compete more effectively. Hence, considering the previous discussion, this study's objective is to answer the following question: **what are the determinants of revenue diversification strategies among Brazilian credit unions?**

Based on the guiding question, this study's objective is to investigate the factors determining revenue diversification among Brazilian credit unions. Additionally, it seeks to identify whether there is a relationship between non-traditional revenue and revenue from credit operations. Nguyen (2012) notes that the behavior between these revenues in emerging economies is poorly understood or investigated. Pennathur et al. (2012) add that studies in this field show different impacts on the risks imposed on banks that diversify into non-traditional sources of revenue; studies are usually restricted to developed nations. Hence, the extent to which these studies' results can be generalized to countries with emerging markets is limited. It is noteworthy that such a limitation is also extended to credit unions, as these are seldom investigated. Moreover, even though credit unions are financial institutions, their characteristics differ from those of banks.

Thus, based on the previous discussion, this paper aims to contribute to the discussion concerning revenue diversification among credit unions, considering that these institutions play an essential role in the development of countries insofar as they can intermediate credit resources efficiently. Cooperatives are also seen as important agents of financial inclusion, as they can take financial products and services to regions that are not supported by banking institutions, enabling greater access to credit. Additionally, these institutions contribute to generating local income, given their commitment to associates and the location where they operate.

Additionally, this study contributes to the literature addressing credit unions by providing an empirical study on the potential determinants of product diversification. Since credit unions are special financial institutions characterized by cooperation and associativism, and are important agents for local development, they should not be neglected by studies with the potential to contribute to their development. Finally, it is relevant to understand the factors that lead credit unions to adopt revenue diversification strategies to maximize revenues from other activities besides credit operations. New sources of income might be important to increase an institution's overall income.

2. Literature review

2.1 Credit cooperatives

Credit unions can be considered financial institutions, which are constituted as cooperative societies whose objective is to provide financial services to their members. Credit unions members have access to the main services banks provide, such as deposit capture (cash or term deposits), loans and financing (credit granting), financial investments, credit cards, checks, collection services, receipts, and payments on behalf of third parties under an agreement with public and correspondent private financial institutions in the country, among others (Banco Central do Brasil, 2021; Pinheiro, 2008).

A credit union is essentially an intermediary financial institution. However, the theoretical standard of treatment of financial intermediaries and cooperative businesses cannot be directly applied to the credit unions' behavior models. There are two main characteristics of credit unions that impede this application: i) members are simultaneously owners of the organization and consumers of results or suppliers of inputs; hence, we cannot assume that members seek to maximize the profits of their transactions with a cooperative; and ii) the members supply and demand financial resources, so the cooperative intermediates between its saving members and borrowing members (Smith, Cargill & Meyer, 1981).

Credit unions enable citizens to obtain services customized to their needs, and a cooperative's positive result, known as surplus, is shared among the cooperative members proportionally to the operations they conducted with the cooperative. Thus, the gains return to the cooperative community. However, cooperative members are also subject to participate in the apportionment of potential losses, proportionally to the services they used (Banco Central do Brasil, 2021).

Thus, even though Brazilian credit unions are financial institutions. They are not called banks and are characterized as member-owned nonprofit partnerships, with their nature and legal form, not subject to bankruptcy, with the objective to provide credit and services to their members (Freitas et al., 2008). Additionally, these institutions do not fail to protect the cooperativism principles (Pinheiro, 2008), which include: free and voluntary membership; members' democratic control; members' economic participation; autonomy and independence; education, training, and information; cooperation between cooperatives and a concern for the community (International Co-operative Alliance, 2022).

As the credit union's mission statement is to serve the interests of its members, its earnings may be disbursed to its members in the form of higher interest rates for deposits, or decreased loan fees, and other fees, rather than disbursements in the form of distribution of results to its associates (Hassan et al., 2018). Therefore, the distribution of any surplus can take many forms, including distribution among members proportionally to their transactions; the development of common services to benefit all members; or the development of the credit union's business, in which the credit union democratically decides among its members the distribution mechanism to be used (Mckillop & Wilson, 2011).

Bearing in mind the uniqueness of credit unions, Bialoskorski Neto, Nagano, and Moraes (2006) mention the need for discussing the methodological development of efficient processes for monitoring cooperative societies, seeking to adapt methods and analyses to the social characteristics of these enterprises. Such a discussion is essential because cooperatives are non-profit civil societies and play an important social role, whether for their members or the community as a whole. For this reason, both an economic analysis and an analysis of social performance are relevant.

An analysis of the relevance of credit unions for Brazilian economic development shows that this sector is considered of singular importance to society as it enables the application of private resources and assumes the corresponding risks for the benefit of the community in which it develops itself. Thus, they contribute significantly to sustainable local development, especially in creating savings and financing business initiatives, which benefit the creation of jobs and income distribution (Soares & Sobrinho, 2008).

Brazilian credit unions expanded their presence in Brazil through their service units, with an increase of 392 units or 5.7% in 2020. In December 2020, credit unions were present in 2,788 Brazilian cities, which correspond to 50.1% of the total, with an increase in the number of cities served in all Brazilian regions, with emphasis on the Midwest (63.8% of the cities were reached). Thus, new service units benefit the places that no longer have bank branches; the number of cities where credit unions are the only face-to-face alternative for obtaining financial services grew to 231 (December 2020). This figure corresponds to 8.3% of the cities where they operate (Banco Central do Brasil, 2020b). Therefore, the credit cooperatives' inclusive role as financial agents is highlighted, as they provide services and products to the most distant communities, often unattended by traditional banking agents (OCB, 2019).

2.2 Financial institutions' diversification

Banking deregulation, as seen in the US market, has transformed the sector along with rapid technological advancements in information flows, communications infrastructure, and financial markets. Deregulation has fostered competition between banks, non-banking and financial institutions, and markets where none existed. In response to these competitive threats and opportunities, many banks have embraced new technologies that have changed their production and distribution strategies, resulting in considerable increases in interest-free income. In contrast, many other banks continue to use traditional banking strategies so that interest-free income remains relatively minor (DeYoung & Rice, 2004).

Thus, deregulation and technological innovation enabled financial institutions to capture an increasing share of income streams. Diversification strategies were implemented through activities and product lines, among others. Additionally, diversification of activities in financial institutions is aligned to their product line, debts, or banking business (Jouida et al., 2017).

In this context, credit unions are also highlighted, which are financial institutions organized to meet the needs of their members (Goddard et al., 2008). Credit unions are institutions that differ in the range of the financial services they provide to their members, with larger cooperatives tending to provide a more diverse menu of financial services (Malikov et al., 2017). Product diversification in credit unions is observed and investigated in different markets, such as in Australia (Esho et al., 2005), the USA (Cuong et al., 2020; Goddard et al., 2008; Malikov et al., 2017), and Kenya (Mathuva, 2016).

One way to identify diversification in financial institutions is through their sources of net operating income. For example, an institution that obtains all its income from interest income (loans) is considered concentrated. In contrast, an institution that obtains its income evenly between interest income and other non-financial income is considered diversified (Stiroh & Rumble, 2006). Studies on credit unions consider the concept of product diversification depending on different sources of income, with diversification operationalized through the participation of non-interest income in total income or by adapting the Herfindahl-Hirschman Index (HHI) for revenue (Esho et al., 2005; Goddard et al., 2008; Mathuva, 2016).

There are several reasons why focus versus diversification is essential in the context of financial institutions. First, financial institutions deal with various, often conflicting, regulations that create incentives to diversify or focus their asset portfolios, such as imposing capital requirements tied to asset risk, branch restrictions, asset investments, etc. Furthermore, the very nature of a financial intermediary's activities makes focus versus diversification an interesting economic issue to be explored, such as monitoring information from borrowers (Acharya, Hasan & Saunders, 2006).

In this sense, more diversified financial institutions can minimize their information monitoring costs, reducing total costs, as various diversification strategies can produce information that improves borrowing through activities such as underwriting of securities, brokerage, and other commercial services. Furthermore, diversification within financial institutions is believed to play an important role in providing resources and reducing the chances of costly financial difficulties (Doan et al., 2018). Hence, the fact that the financial institution works with non-traditional activities can promote banking efficiency (Araújo, Comes & Guerra, 2011).

An issue also emphasized in revenue diversification is the potential relationship between traditional and non-traditional revenue. A positive relationship between traditional and non-traditional income may indicate that the shift to non-traditional activities is beneficial for banking institutions, as it contributes to the improvement of its loan income, coupled with the fact that the freedom to offer a variety of services can also help to more effectively compete with non-bank financial institutions (Nguyen, 2012). However, this positive relationship may also indicate that interest-earning products may have associated fees. Therefore, increasing the volume or frequency of traditional activities could generate a corresponding increase in non-traditional income (Cuong et al., 2020). Thus, non-financial income would rarely occur without concomitant changes in interest income, variable inputs, fixed inputs, and the financing structure (DeYoung & Rice, 2004).

However, some argue that the relationship between traditional and non-traditional revenue can be negative. One explanation for such a relationship would be the fact that banking institutions increase their involvement in non-traditional activities to compensate for a drop in margin income (Nguyen, 2012). Additionally, there is the hypothesis that as non-financial income increases, banks may abandon traditional intermediation, which would result in decreased financial income and simultaneous drops in credit and interest rate risk (Pennathur et al., 2012). Finally, in the case of credit unions, it may happen that cooperatives are still benefiting from the growth of their traditional business, having less incentive to expand into non-traditional and less familiar activities (Cuong et al., 2020).

Thus, some argue that activities that generate non-interest income and are imperfectly associated with those that generate interest income may induce profitable growth and provide a better balance between risk and return (Doan et al., 2018). As proposed by Stiroh (2004), the reason is that a greater correlation between interest and non-interest income suggests greater cross-selling and exposes the various segments of the banking business to the same economic or financial shocks, reducing the potential for diversification benefits.

3. Methodological procedures

3.1 Study design, sample, and data collection

This is a descriptive study, i.e., based on the description and accuracy of the facts and phenomena of a given context (Triviños, 1987). Furthermore, the approach to the problem is quantitative, as it aims to collect and tabulate data for statistical tests and regression analyses. Finally, as for its procedures, this study is classified as a documentary study as documents are used as a data source.

The object of study is singular credit cooperatives belonging to the Sicoob, Sicredi, and Unicred systems, the three largest Brazilian cooperative systems. The cooperatives in these three systems were chosen due to these institutions' similar characteristics, which facilitate comparisons and analyses. According to an overview presented by the Central Bank of Brazil (2018c), in December 2018, individual credit unions from the three systems represented 64.6% of singular credit unions in the sector.

Data concerning credit unions were obtained from the website of the Central Bank of Brazil (2018a). Thus, according to the list of credit unions under the Central Bank (Bacen) supervision, there were a total of 964 cooperatives in operation in Brazil on December 31st, 2018, two of which were confederations (Unicred and Cresol). At the end, 35 central and 927 singular credit unions were identified.

The initial population consisted of 927 singular cooperatives. The following were excluded though to adequate the sample: i) cooperatives that did not belong to the systems analyzed here; ii) cooperatives classified as capital and loan, which are those that do not capture deposits; iii) cooperatives that did not present information in any period under analysis; and iv) cooperatives that were merged during the period under analysis. In the end, we obtained a non-probabilistic sample of 482 singular credit unions, representing 52% of the population.

The analysis period comprised from June 2009 to December 2018, after Complementary Law No. 130, from April 17th, 2009, was enacted. This law was a milestone for the cooperativism sector, as it ensured greater security and regulatory stability and consolidated a diversified financial service provision (Banco Central do Brasil, 2014). The analysis ceased in 2018 to avoid potential abnormal effects resulting from the Covid-19 pandemic. An example of the effects of the pandemic on cooperatives is the considerable percentage of renegotiation of the credit portfolio to adapt credit operations' payments to borrowers' new financial conditions (Banco Central do Brasil, 2020b).

The analysis considered six-month periods because of how information regarding the credit union's financial statements was made available. The database comprised 19 semesters, from December 2009 to December 2018, with a panel composed of 9,158 observations. Note, however, that the first semester of 2009 was not included in the analysis because some variables concerned variations between periods.

3.2 Analytical model

This section presents and discusses the model adopted in this study, which was performed using the Stata® statistical package. To analyze the constraints imposed on the revenue diversification strategies adopted by Brazilian credit unions, a multiple linear regression model, estimated by the Systemic Generalized Method of Moments (System GMM) developed by Blundell and Bond (1998) was used; it is an improvement of the GMM estimator in differences.

Difference GMM and GMM system estimators are designed for panel analysis and incorporate some assumptions, such as the process can be dynamic; there may be an arbitrary distribution of individual fixed effects; there may be endogenous variables; idiosyncratic disturbances may have specific individual heteroscedasticity patterns and serial correlation; idiosyncratic disturbances are not correlated between individuals; some regressors may be predetermined, but not strictly exogenous, and the panel can be short (Roodman, 2009).

Thus, it is a robust method to solve econometric problems, with an emphasis on the problem of endogenous variables, which can be corrected using internal instruments from the data set itself (Roodman, 2009), considering that external instruments may not be available (Cameron & Trivedi, 2005). GMM System was also estimated in two stages and with the Windmeijer correction to obtain better estimates.

The following equation was estimated:

$$DIV_{it} = \beta_1 ROE_{it} + \beta_2 MARGIN + \beta_3 DESPGR_{it} \\ + \beta_4 RISk_{it} + \beta_5 DEP_{it} + \beta_6 \Delta LNA_{it} + u_{it}$$

(1)

Where i = 1, ..., N represents the cooperatives in the sample and t = 1,..., T represents the years under analysis (2009-2 to 2018-2); β is the estimated slope coefficient for each independent variable; $u_{it} = \alpha_i + \varepsilon_{it}$ is the compound error term in which a_i is the unobserved individual effect and ε_{it} is the random error term. DIV is the variable financial products diversification obtained by the participation of revenue not coming from credit operations in total operating income; ROE is the return on equity; MARGIN refers to income from credit operations on total assets; DESPGR is the ratio of operating expenses to total assets; RISK refers to the allowance for doubtful accounts on total credit operations; DEP is the natural logarithm of deposits; ΔLNA is the variation of the natural logarithm of assets.

The following tests were applied to validate the model and obtain consistent results:

1. *Unit Root Test*: is used to verify whether the instrumental variables are not correlated with the fixed effects, which is the case when the process is stationary (Blundell & Bond, 1998). Thus, the Phillips-Perron (PP) test was applied. The null hypothesis considers that all panels contain a unit root, and the alternative hypothesis considers that at least one panel is stationary. Hence, the null hypothesis is expected to be rejected.

2. *Arellano Bond Autocorrelation Test*: is used to verify autocorrelation in the idiosyncratic error term. According to Roodman (2009), a negative and significant first-order autocorrelation is expected, but not a second-order autocorrelation, that is, non-significant. Therefore, the null hypothesis assumes that there is no first- or second-order autocorrelation.

3. *Sargan/Hansen test*: is used to validate GMM and assumes that the instruments are exogenous. Given the model's over-identification, the objective is to verify the joint validity of moment conditions and identify constraints. The null hypothesis assumes that instrumental variables and residuals are not correlated. In this case, two tests can be used: the Sargan and the Hansen Tests (Roodman, 2009). Roodman (2009) also notes that the results are coincident when there is conditional homoscedasticity. However, if there is a suspicion of non-sphericity in the errors, the statistic proposed by Sargan is considered inconsistent, in which case the Hansen Test is indicated; it is considered superior, with a two-stage estimate.

4. *Hansen's Difference Test*: it verifies the validity of the subset of instruments, also known as the C statistic or C test. The null hypothesis assumes that the instruments' subsets are exogenous. When the hypothesis is not rejected, the additional conditions for using the Systemic GMM are valid (Roodman, 2009).

Finally, after applying the tests and validating the models, we analyzed the relationships among the proposed variables. As for the variables that were used in the models, their descriptions and formulas are described in section 3.3 below.

3.3 Description of the variables

The dependent variable is represented by the percentage of income from non-traditional activities (DIV), considered a proxy for diversification and used in several studies addressing this subject (Stiroh & Rumble, 2006; Mercieca et al., 2007; Goddard, McKillop & Wilson, 2008; Lee, Yang & Chang, 2014; Pennathur et al., 2012). Thus, the higher this indicator, the more important non-traditional revenue is for the development of cooperative activities. For Goddard et al. (2008), this variable captures the effect of the direct exposure to revenue diversification, which is described in Formula 2.

$$DIV = \frac{Income\ not\ coming\ from\ Credit\ Operations}{Operating\ Revenue} \qquad (2)$$

This variable was used as a proxy for product diversification by Stiroh and Rumble (2006), Mercieca et al. (2007), Goddard et al. (2008), Pennathur et al. (2012), and Lee et al. (2014).

Based on the literature, six independent variables considered determinants of product diversification were used. These variables are presented below.

Return on Equity (ROE): according to the literature, this is a proxy for the cooperatives' performance, presenting an endogenous relationship with diversification, which results from simultaneity between them (Goddard et al., 2008; Lee et al., 2014). Pennathur et al. (2012) showed that profitability might affect diversification among financial institutions, highlighting a positive financial relationship in India, an emerging country. In this sense, their findings suggest that better-managed financial institutions would be more likely to venture into non-traditional activities to increase their economies of scope and become more competitive (Pennathur et al., 2012). Thus, a positive relationship between ROE and diversification is expected. Return on equity is obtained according to Formula 3.

$$ROE = \frac{Surplus}{Net\ Worth} \qquad (3)$$

Net Interest Margin (MARGIN): this variable is used as a proxy for traditional banking activities (credit operations), expressed as a percentage of total assets. This variable in the model seeks to capture the relationship between revenues from traditional credit and non-traditional operations. A positive relationship between them suggests that changes in the volume of traditional activities can directly lead to changes in non-traditional activities (Cuong et al., 2020). On the other hand, a negative relationship occurs when financial institutions increase their involvement in non-traditional activities to compensate for a decline in traditional activities. Note that an empirical relationship between income from credit operations and those coming from non-traditional activities tends to be weak, with the presence of endogeneity between the variables resulting from the simultaneity between them (Nguyen, 2012). Thus, a negative relationship between this variable and diversification is expected. Formula 4 shows how the net interest margin was operationalized.

$$MARGIN = \frac{Income\ from\ credit\ operations}{Total\ Assets} \qquad (4)$$

General Expenses (DESPGR): according to Bressan, Braga, Bressan, and Resende Filho (2010), this variable is used to measure the costs associated with the management of the credit union's assets, indicating the degree of operational efficiency or inefficiency. Araújo, Gomes, and Guerra (2011) found that interest-free revenues are important to determine the efficiency of banks from the perspective of cost minimization. On the other hand, DeYoung and Roland (2001) point out that diversification may lead to an increase in fixed costs for commercializing other products and services. Therefore, the relationship expected for this variable is uncertain. According to Nguyen (2012), it can be used in the model according to Formula 5.

$$DESPGR = \frac{Operating\ Expenses}{Total\ Assets} \tag{5}$$

Credit Risk (RISK): a variable of credit risk or the quality of loans of credit unions is included to verify how such a risk affects the cooperatives' choices to diversify their products. Pennathur et al. (2012) found that domestic, private banks with poor performance and higher credit risk tend to diversify into non-traditional sources of income. In addition, it is necessary to consider the poor quality of loans, indicated by the recognition of provisions for losses. Therefore, diversification is expected to compensate for the loss of interest on granted but not paid loans (Pennathur et al., 2012; Nguyen, 2012). Thus, a positive relationship between credit risk and diversification is expected. The proxy for credit risk is operationalized according to Equation 6.

$$RISK = \frac{Provisios\ for\ doubtful\ accounts}{Credit\ Operations} \tag{6}$$

Deposits (DEP): this variable is used to verify the effect of the institution's debt structure on diversification (Nguyen, 2012). It is represented by the natural logarithm of the total deposits. We work with the logarithm of the deposits to minimize the amplitude of values and avoid problems in the models' estimation. DeYoung and Rice (2004) emphasize a positive relationship between deposits and income not coming from credit operations. Relationships with depositors have two possibilities: i) provide customers with fee-based services; and/or ii) allow financial institutions to exploit inelastic demand from depositors by selling these services at higher prices. Thus, a positive relationship is expected between this variable and diversification.

Business Growth (ΔLNA): this variable is represented by the variation in the natural logarithm of credit union assets. Financial institutions with high asset growth may be more interested in seeking non-traditional sources of revenue, thus diversifying operations (Pennathur et al., 2012). Thus, a positive relationship is expected between this variable and diversification.

4. Analysis of results

4.1 Descriptive analysis

Table 1 presents the descriptive data of the variables used in the proposed model.

Table 1

Descriptive Statistics of the Quantitative Variables

	DIV	ROE	MARGIN	DESPGR	RISK	DEP	ΔLNA
No. of Observations	9.158	9.158	9.158	9.158	9.158	9.156	9.158
Minimum	0.0074	-0.6849	0.0104	0.0136	0.0016	5.3323	-0.7225
Maximum	0.8365	1.7983	0.2410	0.6300	1.1291	21.6093	1.8593
Median	0.4137	0.0657	0.0647	0.0951	0.0422	17.5280	0.0907
Mean	0.4123	0.0663	0.0678	0.1025	0.0521	17.3805	0.1002
Standard Deviation	0.1360	0.0674	0.0239	0.0412	0.0447	1.7694	0.1127
Coefficient of Variation	0.3298	1.0164	0.3532	0.4014	0.8593	0.1018	1.1252

Source: study's data

The variable Diversification (DIV) showed low variability. The coefficient of variation was 32.98%, suggesting homogeneity among the cooperatives. The median of diversification was 0.4137; more than half of the cooperatives have 41.37%, or more, of their income come from interest-free operations, that is, non-traditional activities. The highest diversification index was 0.8365, suggesting a highly diversified cooperative. On the other hand, the minimum diversification index was 0.0074, indicating low diversification. A minor variation is found when analyzing how the variable behaved on average over the period under study.

The average proportion of revenue coming from non-traditional activities (41.37%) in this sample highlights the importance of this type of revenue for credit unions in an emerging economy such as Brazil. Similarly, Nguyen (2012) emphasizes that non-traditional revenues represent approximately half of all operating revenue generated by US commercial banks and a significant amount of total revenue in many mature economies.

The variable Return on Equity (ROE) presented a coefficient of variation of 101.64%, suggesting heterogeneity in the cooperatives' performance. The median performance was 0.0657. The maximum indicator was 1.7983, and the minimum was 0.6849, indicating a negative performance. Analysis of the average behavior of the variable over the period reveals a high variability, with the worst performance verified in the second half of 2018.

As for the variable Net Interest Margin (MARGIN) obtained a coefficient of variation of 35.32%, suggesting homogeneity in the cooperatives' net interest margin. The median net interest margin was 0.0647. The maximum indicator was 0.2410, and the lowest was 0.0104. The behavior of this variable is presented in Figure 1.
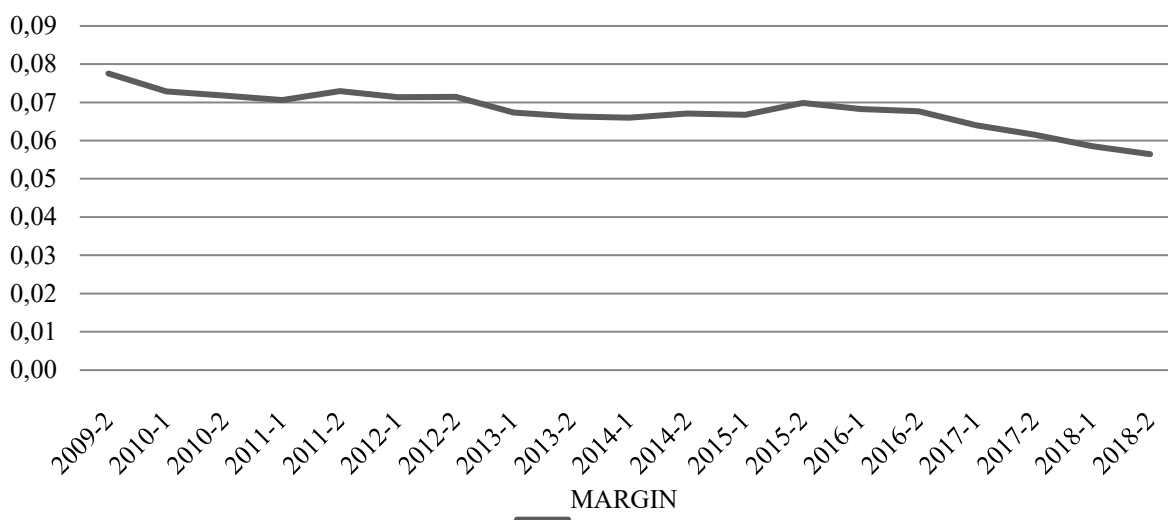
Figure 1. Behavior of the Credit Unions' Net Interest Margin

Source: study's data

Analysis of the average behavior of the net margin variable over the period shows a decline in the net interest margin from 2015-2 onwards, mainly arising from an increase in cooperative assets and lower growth of credit operations. For example, while total assets increased by around 11% from June 2018 to December 2018, revenues from credit operations increased by 6% only.

The variable General Expenses (DESPGR) portrayed a coefficient of variation of 40.14%, not presenting significant dispersion. The median of expenses was 0.0951. The maximum indicator of operating expenses was 0.6300 and the minimum was 0.0136. Analysis of how the variable behaved over the period indicated low variability. The minimum expense recorded occurred in the first half of 2018.

The variable Credit Risk (RISK) presented a coefficient of variation of 85.93%, suggesting heterogeneity in the cooperatives' credit risk. The median credit risk was 0.0422; that is, 50% of the cooperatives present a risk below 0.04. The maximum risk indicator was 1.1291; however, the minimum risk was 0.0016. As for how the variable behaved over the period, a growing trend in credit risk was verified from the second half of 2013 onwards.

However, as noted in the Banco Central do Brasil's (2018c) report, the quality of the cooperatives' credit assets is superior to those remaining in the SFN, though this difference has decreased over time given a significant growth of the SNCC's credit portfolio and a slight change in the cooperative members' profile. Therefore, the expectation is that the quality of the SNCC's credit assets will be even closer to that of the SFN. According to the report, there was an increase in problem assets in the portfolio during the crisis period (2015-2016). The cooperatives already show more stability though, after a decrease was experienced in the period of greater risk, though at a higher level than in 2013/ 2014.

The variable Deposits (DEP) exhibited a coefficient of variation of 10.18%, suggesting homogeneity in the cooperatives' debt structure. The median of the debt structure was 17.52. The maximum indicator was 21.6093, whereas the minimum reached 5.3323. The way this variable behaved over the period indicates a linear growth trend.

Finally, the Business Growth variable (ΔLNA) showed a coefficient of variation of 112.52%, suggesting heterogeneity in the cooperatives' business growth. The median growth was 0.0907. The maximum growth was 1.8593, whereas the minimum was -0.7225, indicating a decrease in assets. The variable's behavior over the period shows a sharp decline in the second half of 2012, with successive declines from 2013 onwards.

4.2 Econometric analysis

Considering the endogenous relationship between the dependent variable, represented by Diversification (DIV), and the independent variables, Return on Equity (ROE) and Net Interest Margin (MARGIN), as well as the study's longitudinal structure, we used a regression model of panel data estimated by the Generalized Systemic Moments Method (Systemic GMM) developed by Blundell and Bond (1998) to analyze the factors determining the credit unions' diversification strategies.

Before estimating GMM System, multicollinearity in the model was verified using the Variance Inflation Factor (VIF), and a Spearman correlation matrix was generated. The mean VIF was 1.67, indicating low multicollinearity between the variables. The correlation matrix is presented in Table 2.

In general, the correlations between the explanatory variables were low, except for the variable Net Interest Margin (MARGIN), which showed the highest correlation with General Expenses (DESPGR) and Deposits (DEP). However, it is noteworthy that this variable is of fundamental importance for the model. As highlighted by Nguyen (2012), the relationship between income from non-traditional activities and income from loans (credit operations) has important implications for a business strategy and the regulatory policy of financial institutions; further studies are suggested to address these implications among emerging economies. Thus, this variable remained in the econometric model.

Table 2

Matrix of Correlation

	ROE	MARGIN	DESPGR	RISK	DEP	ΔLNA
ROE	1.0000					
MARGIN	-0.1257***	1.0000				
DESPGR	-0.3191***	0.6266***	1.0000			
RISK	-0.2510***	0.1546***	0.4954***	1.0000		
DEP	0.2107***	-0.5349***	-0.2391***	0.0661***	1.0000	
ΔLNA	0.1526***	-0.0751***	-0.1161***	-0.1243***	0.0566***	1.0000

*** = significant at 1%.

Source: study's data.

The diagnostic analysis of the model, considering the two-stage GMM System, according to the unit root test, first indicated the model's suitability by showing the existence of panels with stationary series according to the Phillips–Perron (PP) test. As expected, negative and significant first-order autocorrelation and non-significant second-order autocorrelation were found in the analysis of autocorrelation of the error term. As for the instruments' exogeneity, the Hansen test was used (with more robust modulation) and, as expected, proved to be non-significant, as the test's null hypothesis is that the instruments are exogenous. Additionally, Hansen's difference tests were used, which were also not significant, confirming that the subsets of instruments are exogenous, enabling the use of the GMM System.

Therefore, given the validation tests, the effectiveness of the estimation method for the dataset was confirmed. The results of the model estimations through the two-stage GMM System are presented in Table 3.

Table 3
System GMM Estimation Results

Dependent Variable: Div	
	GMM SISTÊMICO
ROE	0.0708**
	(-0.0322)
MARGEM	-0.7383**
	(-0.3081)
DESPGR	0.2359**
	(-0.1187)
RISCO	-0.0119
	(-0.0642)
DEP	-0.0017
	(-0.0024)
ΔLNA	-0.0077
	(-0.0141)
Constant	0.4653***
	(-0.0528)
AR(1)	-17.8291***
AR(2)	-0.6725
Sargan test	433.8127**
Hanses test	373.987
Dif-Hansen test (level)	43.91
Dif-Hansen test (iv)	6.87
No. of observations	9156
No. of groups	482
No. of instruments	383

Notes: the lags of the first differences were used as instruments and in the levels of the variables ROE and MARGIN. The other regressors were assumed to be exogenous. VIF identifies whether the regressors are collinear, with a value of 1.67. The Sargan test indicates that the instruments are correlated with the residuals, while the Hansen test indicates that the instruments are not correlated with the residuals; the latter is more robust. AR(1) was significant and negative, while AR(2) was not significant. Dif-Hansen attests to the orthogonality conditions of the instrument subset. The standard errors are in parentheses; the tests present the statistic value, and the statistical significance is indicated as *10%; **5%; ***1%.

Source: developed by the authors.

The results from estimating the GMM System model indicate that the variables Return on Equity (ROE), Net Interest Margin (MARGIN), and General Expenses (DESPGR) are factors that determine diversification.

Return on Equity (ROE) was used as a proxy to capture the credit unions' performance. This variable was positive and significant at 5%; thus, it indicates that ROE is positively associated with the credit unions' diversification strategies. The findings corroborate the study by Pennathur et al. (2012), which emphasizes that financial institutions with higher administrative quality are more likely to venture into non-traditional activities to increase their economy of scope and promote their competitiveness. Thus, credit unions with higher profits tend to diversify, i.e., cooperatives with better performance could offer more products and services to their members, provide better services and keep members faithful to the institution.

The Net Interest Margin (MARGIN) was used as a proxy to capture activities with traditional credit operations. The variable was significant at 5% and had a negative sign, indicating that MARGIN is negatively associated with credit unions' diversification strategies. Thus, an increase in traditional income is associated with a decrease in non-traditional income. This finding aligns with that of Nguyen (2012) for commercial banks between 1997 and 2004, though it differs from Cuong et al. (2020) regarding American credit unions.

A potential explanation for this relationship between traditional and non-traditional incomes among credit unions is that there is no joint growth between these incomes, which would justify the negative relationship. In contrast, Cuong et al. (2020) verified that traditional cooperatives' income is associated with service fees; therefore, an increase in interest-bearing activities would also generate an increase in fee income.

Perhaps, this negative relationship indicates that non-traditional sources of income may represent business opportunities still not fully explored but with great potential to be addressed by cooperatives in the future. As suggested by Cuong et al. (2020), the reason is that cooperatives can still take advantage of the growth in their traditional activities, having less incentive to expand into non-traditional activities. Furthermore, this negative relationship can indicate potential benefits of diversification since it does not expose the business' various activities to the same shocks (Stiroh, 2004).

In this regard, Figure 2 shows the average growth rate of cooperatives' revenues from traditional and non-traditional activities. Note that, of the 18 periods analyzed here, 10 periods presented the non-traditional revenue's higher growth rate compared to traditional revenue.
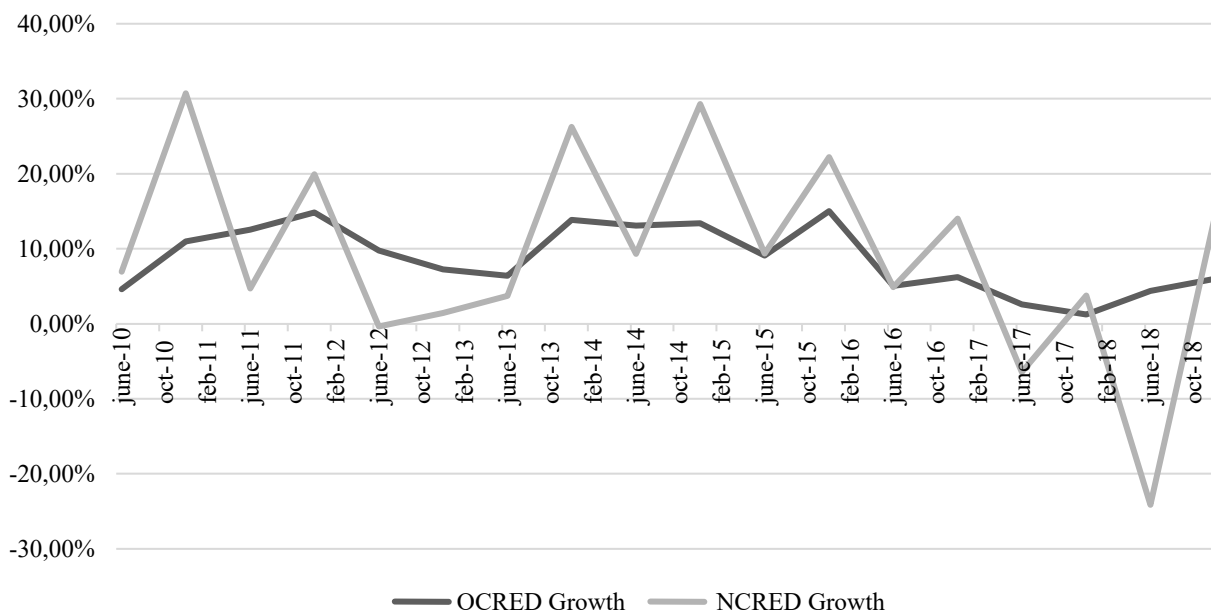
Figure 2. Growth of Income coming from Credit Operations (OCRED) and Income Not Coming from Credit Operations (NCRED)

Source: developed by the authors

As for the variable General Expenses (DESPGR), used as a proxy to capture the costs associated with managing all assets, i.e., the credit unions' efficiency or inefficiency was positive and significant at 5%. Thus, the level of DESPGR is positively associated with diversification. The literature has not reached a consensus regarding this relation, though. Araújo, Gomes, and Guerra (2011) note that interest-free (non-traditional) revenues are important instruments to determine the efficiency of banks.

On the other hand, DeYoung and Roland (2001) assert that diversification may be related to an increase in fixed costs. This is because the main input to producing more loans is variable (interest expenses), while the main input to producing fee-based products is usually fixed (employee expenses). Thus, fee-based activities require greater operating leverage than lending activities (DeYoung & Roland, 2001). In this sense, one of the consequences of increasing credit unions' income diversification may be an increase in operating expenses unions' income. Hence, expenses are a conditioning factor for diversification.

5. Final Considerations

Expansion in the scope of financial institutions' activities is notorious, as credit unions (non-profit entities) have used this strategy to increase the products and services provided to their members. Thus, diversification becomes a relevant subject of study in these institutions. In this context, this study aimed to investigate the determinants of income diversification among Brazilian credit unions, emphasizing a potential relationship between non-traditional and traditional incomes.

The results showed the relevance of non-traditional revenues for credit unions. These revenues are responsible for 41.23% of the cooperatives' total operating revenue. Therefore, similar to financial institutions in mature economies, credit unions also have an expressive proportion of income not coming from credit operations, reinforcing the importance of understanding the factors determining revenue diversification.

A regression model was estimated to meet this study's objective. The dependent variable was the proportion of non-traditional income, which is a proxy for diversification, whereas the independent variables were: return on equity, net interest margin, general expenses, credit risk, deposits, and business growth.

As a result, we found that the variables that determine diversification are: return on equity, net interest margin, and general expenses. Thus, the conclusion is that return on equity is positively associated with diversification, showing that cooperatives with higher profitability are more likely to diversify. The explanation is that more profitable cooperatives have more resources to invest in diversification, providing their members with a broader range of products.

The net margin showed a negative relationship with diversification, suggesting that revenue not coming from credit operations is driven by a decrease in traditional sources of income, i.e., by credit operations, or there is no joint growth between traditional and non-traditional revenues. Hence, a reduction in income from credit operations or the opportunity to provide new products may motivate credit unions to expand their product portfolios.

Therefore, general expenses showed a positive and significant relationship with diversification, indicating that an increase in operating expenses may occur to boost the cooperatives' diversification of activities; thus, operating expenses determine the cooperatives' diversification.

Finally, this study is expected to contribute to understanding the factors that determine credit unions' diversification, emphasizing the relationship between traditional and non-traditional activities in financial institutions operating in an emerging economy. However, this study presents some limitations: variables external to the cooperatives that possibly influence diversification were not addressed here; only one diversification measure was tested, and only the three main Brazilian cooperative systems were addressed. Thus, future studies are suggested to test other proxies for diversification and other factors that possibly impact diversification and verify whether there were changes in the cooperatives' revenue diversification process during the Covid-19 pandemic. Additionally, other risk measures can be explored, considering that it was not significant in this study. According to the literature, this is one of the main factors leading institutions to diversify their operations.

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Influence of auditors' behavior during organizational conflicts on the trust and cooperation established between internal and external auditors

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Abstract

Objective: To analyze the influence of auditors' behavior during organizational conflicts on the trust and cooperation between internal and external auditors.

Method: This descriptive and qualitative survey addressed a sample of 226 internal auditors and 267 external auditors working in Brazilian companies. Based on the factors generated by the factor analysis of the trust and cooperation elements, multiple linear regressions were performed considering the non-confrontation, solution-oriented, and control dimensions for the auditors' attitudes toward organizational conflicts.

Results show that internal and external auditors hold different perspectives on the factors guiding the decision on whether to trust and cooperate. Auditors are also influenced by age, sex, and position. As for their behavior when facing organizational conflicts, most internal and external auditors present attitudes directed toward solving conflicts. This profile positively influences trust and cooperation between internal and external auditors.

Contributions: this study indicates the importance of identifying the profile of auditors and its impact on audit processes, contributing to decision-making in the governance field, to optimize the resources invested in the auditing process.

Keywords: Internal audit; External audit; Cooperation; Trust; Organizational conflicts.

1. Introduction

Corporate governance and the Sarbanes-Oxley Act (SOX) expanded relationships between internal and external auditors. Among the main explanations for this expansion is the requirement for external auditors to issue an opinion on the existence of a comprehensive, efficient, and effective control structure, clearly documented and consistently applied to avoid material misstatements in financial statements (Gramling et al., 2004; Paino et al., 2015).

Professional standards concerning the audit function suggest that the means for internal and external auditors to achieve their respective objectives are similar. Hence, they can eliminate repetitive tasks and avoid unnecessary duplicated work (Saidin, 2014). Although internal and external auditors' primary objectives are different, common interests provide a basis for them to cooperate.

Usually, auditors face important dilemmas when performing their tasks (Morais & Franco, 2019). On the one hand, auditors intend to be thorough with their work to convey confidence. On the other hand, however, they want to decrease costs, be more efficient, avoid excesses that generate dissatisfaction in organizations and limit efficiency, in addition to minimizing risks (Morais & Franco, 2019). The literature has addressed potential solutions for these impasses, considering factors such as trust and cooperation in the relationship between internal and external auditors.

It is complex for external auditors to trust the work of internal auditors, and it does not necessarily depend on a single factor (Gray & Hunton, 2011). Studies have addressed isolated factors, however, that influence the decision of external auditors on whether to trust the work of internal auditors. These factors include criteria to assess the work of internal auditors (Haron et al., 2004), the importance of factors influencing the level of dependence of external auditors on internal auditors (Suwaidan & Qasim, 2010), trust of internal auditors (Mihret & Admassu, 2011), and dependence of external auditors on the work performed by internal auditors (Brody, 2012; Paino et al., 2015). Additionally, studies report the perceptions of internal auditors regarding their level of trust in the external audit process (Endaya, 2014; Saidin, 2014; Morais & Franco, 2019).

Quality internal audit, in terms of competence, objectivity, and team performance at work, contributes to the effectiveness of external auditing (Al-Twaijry et al., 2004). In this sense, cooperation and trust between these professionals and good communication and networking can contribute to knowledge sharing, tools, and methodologies that provide appropriate, fast, and transparent support to make timely decisions in auditing (Morais & Franco, 2019).

Both organizational and individual factors impact trust in the relationship between internal and external auditors. As for individual differences, Brody (2012) highlights that one's work style and experiences may impose barriers to communication and cooperation, impacting judgment on the level of trust in the work performed by internal and external auditors. Furthermore, behavior in the organizational context has become a critical variable in the emergence of organizational conflicts. Based on Putnam and Wilson (1982), organizational conflicts involve a strategic or planned interaction on the part of individuals, so they tend to make choices about their behavior as a result of their own goals and other individuals' goals.

Communication linked to behavior when facing conflicts is a two-way street, so it is interesting to investigate the perceptions of internal and external auditors about barriers imposed in this relationship (Brody, 2012). In addition, internally or externally, the development of the auditing role presupposes a need for studies to explore new situations and factors that possibly impact the efficiency and effectiveness of this function. Circumstances related to cooperation between internal and external auditors have not yet been extensively studied; hence, it is a gap that deserves more attention and needs to be addressed in the academic milieu.

Given the previous discussion, this study is intended to answer the following guiding question: **How does the auditors' behavior during organizational conflicts influence trust and cooperation between internal and external auditors?** To answer this question, the study analyzes the influence of auditors' behavior during organizational conflicts on trust and cooperation between internal and external auditors.

Evidence indicates that the factors promoting trust and cooperation between internal and external auditors differ (Morais & Franco, 2019). Furthermore, assuming that behavior when facing organizational conflicts can be analyzed under a non-confrontational and communicative attitude or oriented towards solution or control, we expect that the level of trust and cooperation between auditors will vary according to their attitudes. Including the role of communication in the relationship established in the auditing process enables us to look beyond the auditors' aspects or those of auditing firms. Conflict is considered inevitable and generalizable within organizational contexts (Katz & Kahn, 1978); however, most organizational researchers tend to ignore the communication factor (Putnam & Wilson, 1982).

This study differs from the remaining and contributes to an analysis of the Brazilian context, contributing to a line of research interested in analyzing factors that influence the audit function. In addition, investigations on the characteristics of auditors in the face of organizational conflicts expand analyses of the work style in the audit function (Brody, 2012) and strengthen the debate on how the analysis of behavior amidst conflicts can provide elements to favor the interaction between internal and external auditors.

Auditing is an activity that reassures its various stakeholders, giving them greater security (Adams, 1994). Thus, investigations into factors related to cooperation and trust in the relationship between internal and external auditors tend to contribute to decision-making in governance bodies, in addition to solving concerns related to the optimization of resources invested in the audit. Also, this study's objective of analyzing the reciprocal relationship between internal and external auditors allows considering different perceptions and experiences, improving this study's evidence.

This paper is divided into 5 sections: introduction, literature review and research hypothesis, methodological procedures, presentation, and analysis of results and conclusions. Section 2 presents the literature review that guided the definition of the research hypothesis. Section 3 contains the methodological aspects, involving the definition of the population and sample, the research constructs and instrument, and the procedures for data analysis. Section 4 presents the results and respective analyzes according to the research constructs. Finally, section 5 summarizes the conclusions.

2 Literature Review and Hypothesis

2.1 Trust and cooperation between auditors

Cooperation between internal and external auditors is vital because it helps external auditors to improve the efficiency and relevance of audit reports and provides additional information needed to assess risk control practiced by internal auditors. Such a conception, related to cooperation, is transmitted to society through a set of global auditing standards that introduce, in an already complex environment, judgments that external auditors should perform regarding internal audit activities (Bame -Aldred et al., 2013). The decision on whether to trust is critical and requires professional judgment though and can be influenced by several factors (Bame-Aldred et al., 2013; Paino et al., 2015).

External auditors consider cooperating with internal auditors beneficial because it can lead to more accurate information and a more efficient auditing process (Ramasawmy & Ramen, 2012). Additionally, errors may be minimized or even eliminated (Al -Twaijry et al., 2004), while external auditing fees may decrease and influence competition in the auditing market (Felix et al., 1998; Haron et al., 2004; Abbass & Aleqab, 2013; Saidin, 2014).

As for internal auditors, Zain et al. (2006) identified that they assess their contribution to the external audit based on effective audit committees with adequate resources. Complementarily, Al-Twaijry, et al. (2004) found results that the degree of cooperation between internal and external auditors fundamentally depends on the quality of the internal audit function. Internal auditors tend to perceive the level of cooperation between internal and external audits to be limited though, while external auditors perceive such cooperation more positively (Al-Twaijry et al., 2004).

Some criteria are important to establish cooperation and trust between external and internal auditors in the auditing process. For example, the scope of the function and technical competence of internal auditors (Haron et al., 2004; Morais & Franco, 2019), the maturity that results from internal auditors' age, the number of years of the internal audit, implementation of international standards into professional practice, internal auditors' certification and experience, the quality of the work performed by the internal auditors (Sarens & Christopher, 2010; Bame-Aldred et al., 2013), and the quality of the auditing committee itself (Al-Twaijry et al., 2004; Desai et al., 2010).

External auditors tend to believe that less effort will be needed during an audit when they depend on internal auditors' work, mainly because internal auditors retain the knowledge of the company's operations, processes, and procedures (Clark et al., 1980). Additionally, the external auditors' work style influences their decisions on whether to depend on internal auditors and the extent of audit procedures (Brody, 2012). In this same context, internal auditors perceive that the trust expressed by external auditors in their work does not change fees; rather, it decreases the extent to which external auditors need to work (Saidin, 2014).

The knowledge of internal and external auditors is not necessarily in conflict. On the contrary, by working together, auditors can create important and convenient synergies (Sarens et al., 2009). In addition, cooperation provides greater security in decision-making (Morais & Franco, 2019) and greater efficiency without the process losing effectiveness (Brody, 2012). Therefore, external auditors should establish effective cooperation agreements with internal auditors and trust in their work the most as possible (Ramasawmy & Ramen, 2012) while still sharing responsibilities (Sawyer et al., 2003) and, consequently, compromising independence.

In this context, good communication is necessary for good cooperation (Brody, 2012; Paino et al., 2015), efficient environment control, and to promote greater trust in the relationship between external and internal auditors (Zain et al., 2006). Barriers in communication between external and internal auditors may compromise audit efficiency though (Paino et al., 2015) and result in adverse experiences that tend to compromise cooperation in future relationships (Brody, 2012).

2.2 Behavior during organizational conflicts and trust and cooperation in audit

To explore the effects of the external auditors' work style, perceived barriers to communication and the effect of client risk management on the dependence on internal audit work, Paino et al. (2015) identified that the external auditors' work style and communication barriers are significantly related with the dependence of external audit on internal audit. In addition, the authors identified that the role of the external auditors (manager *versus* senior) influences their judgment regarding whether to trust the internal auditors' activities.

The work style of auditors is related to how they manage conflicts or disagreements. For example, external auditors with a more passive working style generally do not argue with their clients. Instead, they often prefer to rely on the internal auditors' work without extending audit procedures. However, external auditors with a more active working style tend to dig deeper to substantiate the conflict and show high levels of skepticism. Therefore, they are more willing to work with internal auditors rather than just relying on their work (Paino et al., 2015).

Conceptually, organizational conflicts can be understood as disagreements that may lead to incompatible goals, values, or behaviors (Putnam & Wilson, 1982). In addition, Putnam and Wilson (1982) consider that conflict involves strategic or planned interactions. Therefore, individuals tend to make choices about alternative behaviors, considering their goals and other individuals' anticipated goals.

Conflict strategies refer to verbal and non-verbal communicative behaviors that enable dealing with conflicts. However, such strategies are behavioral choices people make rather than an individual's characteristic style (Putnam & Wilson, 1982). The decision to adopt a specific conflict strategy is governed mainly by situational constraints rather than personality, encompassing variables such as the nature of the conflict, organizational structure, environmental factors, and the relationship among the participants (Putnam & Wilson, 1982). The latter is responsible for involving specialization issues, and roles played in the organizational context. For Putnam and Wilson (1982), behaviors based on organizational conflicts tend to be subdivided into three approaches: (i) non-confrontation, (ii) solution-oriented, and (iii) control.

Individuals who fit the non-confrontational approach tend to choose indirect strategies to deal with a conflict, seeking to avoid or withdraw from disagreements and use communicative behaviors, such as silence, to cover up differences and hide negative feelings. The solution-oriented approach involves individuals who opt for direct communication, with behaviors that aim to find a solution, integrate the needs of both parties, and give in or compromise contradictory issues. Finally, individuals characterized by the control approach establish direct communication to discuss disagreements, persistently arguing, taking control or assuming the interaction, and defending someone's opinion (Putnam & Wilson, 1982).

Regarding how barriers previously experienced in communication and cooperation influence a potential dependence on the internal auditors' work, Brody (2012) identified that, besides client risks and internal audit quality, external auditors' trust may depend on their willingness to confront management or avoid conflict, as well as their perceptions of whether it is pleasant or unpleasant to work with internal audit teams.

The audit process involves ongoing communication between external auditors and clients, specifically internal auditors. In this sense, communication barriers can affect the quantity and quality of interaction (Brody, 2012). Thus, overcoming a conflict often depends on the conflict management method auditors choose. For example, while individuals who consider conflict harmful tend to avoid or analyze it with suspicion, in addition to encouraging consensus and repressing disagreements, others may view conflict as unpleasant though productive and constructive (Brody, 2012).

The literature argues that different individuals respond differently to the same situation according to their style of managing conflicts in the organizational context. According to Brody (2012), individuals less willing to actively engage with internal auditors may issue antecedent judgments that lead to the end, showing a greater willingness to accept the internal auditors' work and evaluate the audit function as reliable and valuable. However, individuals more willing to actively engage in other works with the internal auditors tend to make prior judgments that lead to further investigation and greater work demand.

That said, the strategies adopted by external and internal auditors in organizational conflicts are expected to change the perception of the elements behind trust and cooperation in the audit function. Hence, this study's hypothesis summarizes this expectation.

H$_1$: The auditors' behavior in organizational conflicts influences trust and cooperation between internal and external auditors.

3. Methodological Procedures

3.1 Population and sample

The study population included internal and external auditors working in Brazilian companies. To identify external auditors, the list of independent auditors from the *Cadastro Nacional de Auditores Independentes (CNAI)* [National Registry of Independent Auditors], Federal Accounting Council (CFC) was used. Within the scope of internal auditors, we considered auditors certified by the *Instituto dos Auditores Internos do Brasil (IIA Brasil)* [Institute of Internal Auditors of Brazil], in addition to those whose position reported in the LinkedIn® network is internal auditor. The study population comprised 1,619 internal auditors and 4,404 external auditors.

Considering the total number of internal and external auditors, the study sample was based on an initial search for active registrations on LinkedIn® for two months. Therefore, 1,438 internal auditors and 2,756 external auditors were contacted. The final sample consisted of the valid responses of 226 internal and 267 external auditors.

3.2 Study's constructs and instrument

The instrument applied to internal and external auditors included the constructs of trust and cooperation and organizational conflicts, in addition to questions intended to characterize the respondents. The questionnaire was structured on the Google Docs platform and made available through the link: https://docs.google.com/forms/d/e/1FAIpQLSd0GfIwXcrD77V4u7AQs-i8sqR4jdjhwTIyRKxDhacUBE1bOA/ viewform

The study constructs, used to synthesize the variables, are described in Table 1.

Table 1
Study variables

Construct	Description	Questions	Scale	Reference
Sample characteristics	Age	5 questions	-	-
	Sex			
	Position			
	Experience in Auditing			
	Work in one of the Big Four*			
Trust and Cooperation	Elements considered in the decision to trust or cooperate.	21 statements	7-point Likert Scale "Not Relevant at all" – "Totally Relevant"	Morais and Franco (2019)
Organizational conflicts	Measurement of interpersonal strategies when facing organizational conflicts, subdivided into three dimensions: (i) non-confrontation, (ii) solution orientation, and (iii) control.	Non-confrontation 12 items	7-point Likert Scale "Totally disagree" – "Totally agree'	Putnam and Wilson (1982)
		Solution-oriented 11 items		
		Control 7 items		

*Concerning only the external auditors.

Issues related to the organizational conflict construct are subdivided into three dimensions, based on which one can identify the strategies employed by auditors when facing organizational conflicts. Auditors may obtain a score between 12 and 84 in the non-confrontation dimension. Next, a score between 11 and 77 may be obtained in the solution-oriented dimension, indicating a low to high solution-oriented profile. Finally, auditors may score between 7 and 49 in the control dimension, ranging from low to high profile. Table 2 summarizes the issues inherent to each dimension.

Table 2

Instrument to analyze organizational conflicts

Dimension	Statements
Non-Confrontation	I avoid topics that are a source of dispute.
	I avoid unpleasant situations.
	When I suspect a person wants to discuss a disagreement, I try to avoid it.
	I keep quiet about my opinions to avoid disagreements.
	I withdraw when someone confronts me about a controversial issue.
	I avoid disagreements when they arise.
	I keep my opinion instead of arguing.
	I try to smooth over disagreements, making them seem unimportant.
	I ease conflict by claiming our differences are trivial.
	I underestimate the importance of the disagreement.
	I reduce disagreements by saying they are insignificant.
	I make our differences seem less severe.
Solution-oriented	I harmonize my ideas with those of others to create alternatives to resolve a conflict.
	I suggest solutions that combine a variety of viewpoints.
	I compromise my ideas a little when the other person also compromises.
	I offer creative solutions when discussing disagreements.
	I suggest that we work together to create solutions to disagreements.
	I try to use everyone's ideas to generate solutions to problems.
	I offer exchanges to reach disagreement solutions.
	I tend to give in a little if the other person comes to me during the process.
	I find opposition amid our differences.
	I integrate arguments into a new solution from issues raised in a dispute.
	I will go little by little to reach an agreement.
Control	I insist that my position be accepted during a conflict.
	I emphasize my point by slamming my fist on the table.
	I raise my voice to get someone else to accept my position.
	I assert my opinion forcefully.
	My arguments dominate until the other person understands my position.
	I insistently defend my position on her.
	I stand firm in my opinions during a conflict.

Source: adapted from Putnam and Wilson (1982).

Table 2 shows that the items that compose the dimensions of the organizational conflict construct are based on aspects of the communication adopted by the auditors when facing conflicting situations.

3.3 Data analysis

Descriptive statistics were initially used in data analysis, considering the questions that characterized the sample and the organizational conflict construct. Next, exploratory factor analysis was performed for the items referring to the construct of trust and cooperation in the relationship between internal and external auditors. Using factor analysis, we sought to synthesize the relationships between a set of interrelated variables to identify common factors (Fávero et al., 2009). Hence, the 21 elements of trust and cooperation were grouped into common factors. Finally, the factors generated by the factor analysis are analyzed in terms of descriptive statistics and, later, were used as dependent variables in the main analysis.

The main analysis, which seeks to analyze whether the behavior of auditors in organizational conflicts is related to trust and cooperation between internal and external auditors, involves the operationalization of Equations 1 and 2. Initially, the trust and cooperation factors are related to the auditors' characteristics, according to Equation 1.

$$Dep = \beta_0 + \beta_1 TA + \beta_2 ID + \beta_3 SX + \beta_4 EXP + \beta_5 CA\_Senior \\ + \beta_6 CA\_Manager + \beta_7 CA\_Director + \varepsilon \tag{1}$$

Where:

Dep = corresponds to the dependent variable, alternating between the factors obtained by the factor analysis regarding the items trust and cooperation: (i) Collaboration and Work Sharing; (ii) Work Operationalization; and (iii) Expertise.

TA = corresponds to the type of auditor. It is a dummy variable in which 1 is assigned to internal auditors and 0 to external auditors.

ID = corresponds to the auditors' age.

SX = corresponds to the auditors' sex. It is a dummy variable in which 1 is assigned to Women and 0 to men.

EXP = corresponds to the auditors' experience with auditing.

CA_Senior = corresponds to auditors Senior. It is a dummy variable in which 1 is assigned to auditors Senior and 0 otherwise.

CA_Manager = corresponds to auditors Managers. It is a dummy variable in which 1 is assigned to auditors Managers and 0 otherwise.

CA_Director = corresponds to auditors Directors. It is a dummy variable in which 1 is assigned to auditors Directors and 0 otherwise.

ε = random error term.

Next, the variables concerning the three dimensions of the Organizational Conflicts construct were included: Non-Confrontation (CO_NC), Solution Orientation (CO_OS), and Control (CO_C), according to Equation 2.

$$Dep = \beta_0 + \beta_1 TA + \beta_2 CO\_NC + \beta_3 CO\_OS + \beta_4 CO\_C + \beta_5 ID + \beta_6 SX + \beta_7 EXP \\ + \beta_8 CA\_Senior + \beta_6 CA\_Manager + \beta_7 CA\_Director + \varepsilon \tag{2}$$

Where:

CO_NC = corresponds to the non-confrontation dimension when facing organizational conflicts.

CO_OS = corresponds to the solution-oriented dimension when facing organizational conflicts.

CO_C = corresponds to the control dimension when facing organizational conflicts.

All the models were operationalized using the multiple linear regression technique by the Ordinary Least Squares method.

4. Presentation and analysis of results

4.1 Sample characterization

Table 1 presents the sample's characteristics according to internal auditors (Panel A) and external auditors (Panel B).

Table 1
Sample characterization

Panel A: Internal auditors					
Experience					
Sex	1-5 years	6-10 years	11-20 years	21-30 years	+ 30 years	Total
Female	17	20	13	3	1	54
Male	64	44	45	17	2	172
Total IA	81	64	58	20	3	226

Panel B: External Auditors							
Experience							
Sex	Firma	1-5 years	6-10 years	11-20 years	21-30 years	+ 30 years	Subtotal	Total
Female	BigFour	11	11	4	1	0	27	52
	Not BigFour	5	14	3	3	0	25	
Subtotal		**16**	**25**	**7**	**4**	**0**		
Male	BigFour	19	47	26	6	5	103	215
	Not BigFour	15	21	45	19	12	112	
Subtotal		**34**	**68**	**71**	**25**	**17**		
Total EA		50	93	78	29	17		**267**

Note. IA: Internal auditors; EA: External auditors

Regarding gender, there is a predominance of male auditors, both in the context of internal and external audits. This finding is consistent with the profile of auditors, in which the profession tends to be predominantly occupied by men.

Regarding professional experience in the audit field, most respondents are at the beginning of their careers; few respondents reported an experience of more than 20 years. Furthermore, in the context of external auditing, women are clearly less experienced in the field. This finding may be explained by current changes in the profile of auditors.

Finally, the performance of external auditors in Big Four accounting firms does not tend to be a factor differentiating them from auditors working in non-Big Four firms in terms of professional experience.

4.2 Descriptive statistics of the auditors' behavior when facing organizational conflicts

Table 2 presents the descriptive statistics regarding the behavior profile of internal and external auditors when facing organizational conflicts according to sex.

According to Table 2, both internal auditors and external auditors lean towards the solution-oriented dimension when facing organizational conflicts. In addition, it seems that the auditors' sex does not influence this tendency. Furthermore, the auditors showed a lower level of non-confrontation and control behavior when facing organizational conflicts.

In general, the mean score obtained by the internal auditors in the solution-oriented dimension was above 56 in a maximum of 77 points, which corresponds to 72.7%. Therefore, within the scope of external auditors, the mean score above 55 points characterizes them with 71.4%.

Table 2

Descriptive statistics of the auditors' behavior when facing organizational conflicts

		Panel A: Internal auditors									
		Mean		**SD**		**Median**		**Minimum**		**Maximum**	
Dimensions	**Interval**	M	W	M	W	M	W	M	W	M	W
Non-Confrontation	12-84	33.6	33.5	13.8	11.0	30	33.5	12	14	84	57
Solution-oriented	11-77	57.4	56.7	9.4	8.29	58	57	12	34	77	72
Control	7-49	23.4	24.6	7.6	6.92	22.5	25	7	9	49	43

			Panel B: External Auditors									
			Mean		**SD**		**Median**		**Minimum**		**Maximum**	
Dimensions	**Interval**		M	W	M	W	M	W	M	W	M	W
Non-Confrontation	12-84	Big4	35.4	32.6	16.0	9.7	32	31	12	18	84	64
		NBig4	31.3	36.7	12.1	12.2	30	35	12	20	77	62
Solution-oriented	11-77	Big4	54.2	55.0	10.6	10.5	56	57	21	27	77	69
		NBig4	53.0	55.3	9.7	7.3	53	57	15	34	74	73
Control	7-49	Big4	25.0	24.4	7.9	6.6	25	24	7	13	49	38
			23.9	22.2	7.0	7.0	24	22	7	11	42	37

Note. SD: Standard Deviation; M: Men; W: Women.

The predominance of profiles leaning toward the solution of conflicts shows that both internal and external Brazilian auditors tend to directly communicate during conflicts, expressing behaviors that facilitates finding a solution, either by reconciling the needs of both parties or reaching a compromise (Putnam & Wilson, 1982). Furthermore, in line with Paino et al. (2015), the work style of the auditors addressed here can be defined as active, as they tend to delve deeper into issues underlying conflicts to substantiate them.

These observations are confirmed by the percentages obtained: 39.2% of internal auditors and 41.6% of external auditors showed a predominance of a non-confrontational profile. Finally, in terms of control, the percentage of internal (48.9%) and external (51.0%) auditors in this profile can be considered a complement to the active profile characteristic of auditors since this dimension encompasses direct communication, with persistent argumentation and taking control or interaction (Putnam & Wilson, 1982).

4.3 Exploratory factor analysis of trust and cooperation

Table 3 presents the trust and cooperation items distribution according to factors. The answers' validity and reliability were verified to confirm the sample's adequacy. According to Hair et al. (2009), the factor loadings depend on the size of the validation sample. For a sample of over 350 respondents, values from 0.30 are considered significant to ensure statistical robustness. Normality was verified using the Bartlett sphericity test (0.000) and the Kaiser-Meyer-Olkin (KMO) value (0.93).

According to the variance explained, the factor understood as collaboration and work sharing (47.35%) appears as the most important factor for establishing trust and cooperation in the relationship between internal and external auditors. This factor aggregates items related to the audit work performance from a high interaction level between internal and external audits. More precisely, the joint action of both audits regarding the development of audit planning, work coverage map, and convergence between the techniques used can improve trust and cooperation between the groups of auditors. Additionally, it is clear that sharing information, in addition to communication, are important factors influencing the decision on whether to trust and cooperate in the audit function.

Table 3

Factor analysis of the trust and cooperation items

Extracted Factors	Items	Factor Weights			
		F1	F2	F3	h²
Factor 1 Collaboration and Work Sharing	15. If necessary, both audits jointly adjust the audit plans.	0.857			0.760
	13. Participation in the joint development of the full coverage map of the internal and external audit work.	0.819			0.742
	14. External audit and internal audit are jointly assessed for the effectiveness and efficiency of coordination, including total costs.	0.808			0.731
	16. Sharing Risk Assessments.	0.770			0.693
	17. Joint discussion of audit, risk management, and internal controls issues.	0.749			0.697
	12. Holding joint and periodic meetings to ensure coordination and minimize duplicated efforts.	0.716			0.678
	19. Not duplicate work performed by internal audit or external audit if work is of the same nature and scope.	0.660			0.486
	18. Include recommendations proposed by internal audit or external audit in your follow-up work.	0.618			0.577
	20. Communication of discrepancies between internal audit and external audit to management.	0.576			0.477
	10. Using similar techniques, methods, and terminology between external audit and internal audit.	0.445			0.436
Factor 2 Work Operationalization	05. Good knowledge of the audited entity (client) processes, operations, and procedures.		0.837		0.792
	09. Obtaining sufficient, appropriate and consistent audit evidence with the opinion expressed.		0.832		0.778
	06. Good knowledge of the risk management processes and internal controls of the audited entity (client).		0.814		0.790
	08. Preparing complete and consistent audit reports.		0.788		0.733
	04. Following international standards of auditing practices.		0.633		0.679
	21. Internal audit work is effectively planned.		0.631		0.534
	11. Provision of all reports and other documents to an external audit or internal audit.		0.483		0.507
Factor 3 Expertise	02. Professional certification.			0.852	0.781
	01. Appropriate academic training.			0.688	0.625
	03. High professional experience in external audit/internal audit.			0.590	0.663
	07. Using auditing software to perform the audit.			0.586	0.520
	Total eigenvalues	**9.94**	**2.61**	**1.12**	
	% explained variance	**47.35**	**12.43**	**5.34**	

The items related to the operationalization of the audit work were grouped in factor 2, with an explained variance of 12.43%. In this factor, trust and cooperation between internal and external auditors tend to depend on a good level of knowledge about auditing processes and standards, in addition to providing and obtaining adequate and sufficient evidence and preparing complete and consistent reports.

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Finally, items related to the auditors' expertise, such as obtaining professional certifications, training, technological improvement in the audit process, and experience, showed an explained variance of 5.34%. Thus, aspects of the auditors' level of competence tend to impact trust and cooperation between internal and external auditing; however, it is not the factor with the highest explanatory power.

Some of these findings are consistent with those reported by Morais and Franco (2019). The competence of Portuguese auditors was also interpreted as the factor with the least explanatory power regarding the decision to trust and cooperate. Such evidence contradicts previous studies (Haron et al., 2004; Al-Twaijry et al., 2004; Mihret & Admassu, 2011) that support that competence and experience are factors associated with trust between internal and external auditors.

As opposed to Morais and Franco (2019), Brazilian auditors tended to decide about trust and cooperation mainly based on elements related to the interaction between internal and external audits (Factor 1). In turn, the auditors in the Portuguese context perceive the items concerning work operationalization as more important to influence trust and cooperation in audit processes.

Next, a statistical analysis is performed to address the factors identified in the factor analysis according to sex and the accounting firms' structure (the latter, for external auditors only). Table 4 presents a summary of the results.

Table 4
Descriptive statistics of the trust and cooperation factors

Panel A: Internal auditors											
Factors			**Mean**		**SD**		**Median**		**Minimum**		**Maximum**	
	Intevarl		M	W	M	W	M	W	M	W	M	W
Factor 1	10-70		57.0	59.8	12.5	9.9	60	63	10	35	70	70
Factor 2	7-49		39.6	39.9	4.0	2.7	41	41	7	31	42	42
Factor 3	4-28		23.9	23.6	4.0	3.7	25	24	6	9	28	28
Panel B: External auditors											
Factors			**Mean**		**SD**		**Median**		**Minimum**		**Maximum**	
	Intevarl		M	W	M	W	M	W	M	W	M	W
Factor 1	10-70	Big4	52.5	50.5	13.7	13.3	57	55	19	24	70	70
		NBig4	53.3	54.0	12.3	9.6	55	54	12	37	70	70
Factor 2	7-49	Big4	36.0	37.4	6.9	5.9	37	39	6	18	42	42
		NBig4	36.9	39.9	6.3	2.2	39	41	6	34	42	42
Factor 3	4-28	Big4	21.3	23.7	5.3	4.3	22	25	6	9	28	28
		NBig4	23.1	24.2	4.6	4.1	24	26	6	14	28	28

Note. SD: Standard Deviation; M: Men; W: Women. Factor 1: Collaboration and Work Sharing; Factor 2: Work Operationalization; Factor 3: Expertise.

Even though the mean values of each factor are similar for both internal and external auditors, the minimum values characteristic of women working in internal and external auditing for the three factors stand out. Women generally rate aspects related to trust and cooperation from the second point on the 7-point Likert scale ranging from "Not at all relevant to Totally relevant". This finding suggests that women consider that no element is "not relevant at all" to determine whether to establish trust and cooperation between internal and external auditors.

Furthermore, the performance of external auditors working in one of the Big Four firms cannot be interpreted as a condition that distinctly impacts the level of trust and cooperation between auditors.

4.4 Analysis of the relationships

Table 5 presents the analysis of the relationship between the trust and cooperation factors and the auditors' characteristics, such as type (internal or external), age, gender, experience, and position.

Table 5

Results of the relationship between the auditor's characteristics and the trust and cooperation factors

	Collaboration and Work Sharing	Work Operationalization	Expertise
	Coefficient (Est. *t*)	Coefficient (Est. *t*)	Coefficient (Est. *t*)
Type of Auditor (IA/EA)	**5.104*** (4.10)**	**2.692*** (5.71)**	**1.237*** (2.79)**
Age	0.043 (0.46)	0.021 (0.49)	**0.066** (2.10)**
Sex	1.207 (0.96)	**1.382*** (2.89)**	**0.937** (2.02)**
Experience	0.072 (0.63)	0.011 (0.25)	-0.021 (-0.56)
Position_Senior	-1.330 (-0.63)	-0.996 (-1.31)	-0.862 (-1.14)
Position_Manager	-1.309 (-0.61)	**-1.937** (-2.42)**	-1.214 (-1.58)
Position_Director	-0.723 (-0.28)	-0.636 (-0.75)	-0.201 (-0.24)
R^2	0.045	0.087	0.047
Mean VIF	2.87	2.87	2.87
Durbin Watson	1.94	1.98	1.99
Model's significance	0.000	0.000	0.003
No. of Observations	493	493	493

* Significance at 0.10; ** 0.05; *** 0.01.
Note. IA: Internal auditor; EA: external auditor; VIF: Variance Inflation Factor.

The results reveal that the type of auditor (dummy variable, where 1 represents internal auditors and 0 external auditors) in the general sample is positively and significantly associated at 1% with collaboration and work sharing, work operationalization, and expertise. In this sense, internal auditors, more than external auditors, indicate that collaboration and work sharing, work operationalization, and expertise can improve trust and cooperation between internal and external audits.

According to Morais and Franco (2019), a greater perception of internal auditors regarding the trust and cooperation factors may be related to their understanding of organizational processes and standards, believing in the benefits of cooperation and its contribution to completing the external audit process (Ramasawmy & Ramen, 2012).

Regarding the auditors' characteristics, gender tends to impact the relationship of trust and cooperation, especially concerning work operationalization, in which a significant relationship was verified at the 1% level, as well as expertise at 5%. These findings enable us to infer that women distinctively assess the elements regarding trust and cooperation between internal and external auditors.

Furthermore, cooperation and trust based on the auditors' level of expertise may be related to their age. As a result, older auditors may interpret the importance of elements related to experience, training, and certifications differently when deciding whether to trust and cooperate. Finally, a negative and significant relationship at the 5% level was identified between the performance of auditors in management positions and trust and cooperation in relation to the work operationalization factor. This result is somewhat consistent with the evidence provided by Paino et al. (2015) that the role of external auditors influences one's judgment on whether to internal auditors' activities.

The non-significant results between the auditors' professional experience and the trust and cooperation factors contradict some previous studies (Desai et al., 2010; Sarens & Christopher, 2010) but corroborate the evidence obtained by Morais and Franco (2019) in Portugal.

Next, the dimensions related to the behavior of auditors when facing organizational conflicts were included (according to Equation 2) to verify whether the predominance of certain attitudes can change the level of trust and cooperation between internal and external auditors. Table 6 presents the results.

Table 6

Results concerning the relationship between organizational conflicts and trust and cooperation

	Collaboration and Work Sharing	Work Operationalization	Expertise
	Coefficient (Est. *t*)	Coefficient (Est. *t*)	Coefficient (Est. *t*)
Type of Auditor (IA/EA)	4.327*** (3.60)	1.885*** (4.22)	0.776* (1.79)
CO_Dimension1	0.034 (0.76)	**-0.093*** (-3.99)**	**-0.032** (-1.97)**
CO_ Dimension2	**0.433*** (5.95)**	**0.272*** (6.02)**	**0.179*** (6.01)**
CO_ Dimension3	**0.170** (2.09)**	0.000 (0.03)	0.017 (0.64)
Age	-0.008 (-0.10)	0.007 (0.20)	0.053* (1.81)
Sex	0.992 (0.79)	1.231*** (2.82)	0.841* (1.92)
Experience	0.051 (0.48)	-0.025 (-0.57)	-0.040 (-1.14)
Position_Senior	-1.594 (-0.80)	-0.950 (-1.30)	-0.870 (-1.22)
Position _Manager	-1.309 (-0.66)	-1.747** (-2.36)	-1.128 (-1.57)
Position _Director	1.277 (0.51)	0.045 (0.06)	0.405 (0.48)
R^2	0.188	0.293	0.178
Mean VIF	2.42	2.42	2.42
Durbin Watson	1.91	1.97	1.92
Model's significance	0.000	0.000	0.000
No. of observations	493	493	493

* significance at 0.10; ** 0.05; *** 0.01.
Note. IA: internal auditor; EA: external auditor; CO_Dimension1: Non-confrontation dimension of the Organizational Conflicts construct; CO_Dimension2: Solution-oriented dimension of the Organizational Conflicts construct; CO_ Dimension3: Control dimension of the Organizational Conflicts construct; VIF: Variance Inflation Factor.

Table 6 highlights the values related to R^2 found in the models after the inclusion of variables related to the behavior of auditors facing organizational conflicts. The inclusion of these variables allows us to infer that the behavior of auditors presents greater explanatory power on the elements considered important for trust and cooperation between internal and external auditors compared to the auditors' characteristics.

The first model shows a positive and significant relationship at 1% and 5% with the solution-oriented (CO_Dimension2) and control (CO_Dimension3) dimensions, respectively. Furthermore, the involvement of auditors in organizational conflicts, expressing attitudes that indicate a tendency towards solution-oriented and control tends to improve trust and cooperation based on collaboration and work sharing.

Regarding the second and third models, a negative and significant relationship is found between the non-confrontation dimension (CO_Dimension1) and the trust and cooperation factors related to work operationalization and expertise. These results show that auditors with a profile oriented towards non-confrontation tend to decrease the level of interaction between internal and external auditors.

Conversely, the positive and significant relationship between the variables indicates that auditors with profiles oriented towards conflict resolution (CO_Dimension2) manage to improve the level of trust and cooperation in the work operationalization and expertise factors.

That said, this study's hypothesis H_1 failed to be rejected, considering that the behavior of auditors in organizational conflicts influences trust and cooperation between internal and external auditors.

5. Conclusions

This study analyzed the influence of auditors' behavior in situations of organizational conflicts on the level of trust and cooperation between internal and external auditors. A questionnaire was sent, via the LinkedIn® network, to internal and external auditors working in Brazil to identify the important factors influencing trust and cooperation in the audit process and the behavior of auditors when facing organizational conflicts. The responses of 226 internal auditors and 267 external auditors, collected between March and April 2020, were considered valid.

The results presented three factors that are common to internal and external auditors regarding trust and cooperation: (i) collaboration and work sharing, (ii) work operationalization, and (iii) expertise. Collaboration and work sharing proved to be the most relevant factor for establishing trust and cooperation between auditors. Thus, there is a high level of interaction between Brazilian internal and external auditors, with good communication between the parties, and the ability to express differences and gather efforts to devise plans and audit processes, which are the main characteristics guiding the decision on whether to trust and cooperate.

As for the differences concerning the auditors' area of activity, this study supports that internal auditors perceive collaboration, work sharing, work operationalization, and expertise as factors that contribute to establishing a relationship of trust and cooperation between the parties. Furthermore, the auditors' characteristics, such as gender, age, and position, may be aspects that influence auditors to trust and cooperate during audit processes.

The profile of auditors when facing organizational conflicts directed towards a search for solutions can improve the level of trust and cooperation between internal and external auditors. Thus, the ability to resolve conflicts, whether by reconciling positions or reconsidering previously established opinions, are characteristics that impact the audit process.

In addition, the position of auditors regarding avoiding situations that generate conflicts and choosing not to express opinions about divergences may decrease the level of trust and cooperation pertinent to work operationalization and expertise. Thus, non-confrontational behaviors or behaviors not aimed at conflict resolution may not promote trust and cooperation between internal and external auditors.

This study's evidence is relevant for regulatory bodies, accounting firms, and audit committees due to the importance of observing the profile of auditors when facing conflicts. Additionally, the results can contribute to building collaborative audit teams, both internally and externally, which can positively impact audit quality.

The implications for the scientific field concern a greater understanding of the factors influencing the level of cooperation and trust in the relationship between internal and external auditors, especially among Brazilian auditors. Additionally, it advances the analyses related to audit efficiency and quality, looking at the impact of behavioral factors, such as the profile of auditors when facing organizational conflicts.

Future studies may address trust and cooperation from the perspective of non-auditors, such as directors or managers who use the information provided in audit functions. Hence, further research addressing the profile of auditors when facing organizational conflicts is suggested to relate the profile of auditors to the efficiency and quality of the audit process itself.

Finally, caution is needed regarding the generalization of this study's results. First, the possibility that one's attitude towards organizational conflicts, as reported by the internal auditors, is influenced by their employment contract is highlighted. Thus, the findings regarding the internal auditors' perceptions may result from factors intrinsic to the companies' internal processes or even to the senior management's needs and objectives. Furthermore, the option to analyze organizational conflicts regarding communication criteria (Putnam & Wilson, 1982) restricts the interpretation of results, not allowing a more specific analysis, such as relating them to the behavior of auditors when making accounting decisions.

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Money burns a hole in your pocket: a case of financial education

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Abstract

Purpose and method: This teaching case portrays a family's adverse financial situation, a time when the breadwinner is about to retire. Even with an excellent monthly income, this individual never thought about the future and used all resources to meet immediate needs, not generating extra income to complement his retirement income. This fictional case is described using a playful narrative and dialogues based on the authors' experiences, depicting real-world objectives and situations. Hence, it instigates and promotes a reflection on the importance of financial education with all the aspects that involve earning income, saving, spending consciously, investments, and, finally, aiming for a sustainable retirement.

Outcomes and contributions: This paper highlights financial education and its importance in ensuring one's economically viable (and sustainable) future. The income, expenditure, and investment tripod is expected to become a virtuous circle. This teaching case is suggested for courses addressing finances, budgeting and financial management, and others related to personal finance and even transversal teaching.

Keywords: financial education, personal finance, investments, teaching case.

1. The case

It is spring; a sunny and fragrant day begins. In the autumn season, Itajaí has a pleasant temperature, and the weather on Beira Rio Avenue is suitable for exercising. As usual, Jorge gets up at five in the morning, has his breakfast, and comes down from his apartment to meet Marcelo, his personal trainer, who is already waiting for him. Advised by Jorge's cardiologist, Marcelo includes moderate physical activity, guiding the practice according to Jorge's health problems.

A few weeks ago, Marcelo noticed his student tense. He is not used to asking about his students' personal lives, but with Jorge, it is different. The two have cultivated a friendship and partnership that has lasted for five years since Jorge underwent heart surgery.

- Good morning, Jorge, is everything ok?

- Good morning, Marcelo. Yes, everything is fine!

- Today, we'll walk along the river, and then we'll do some stretching to relax. Is that ok?

- As you say, you're the boss! Jorge says in a sort of moody tone.

So, Marcelo takes advantage of the unpretentious walk and asks what is happening.

- You seem a little tense these last weeks. You know you should take care and avoid being anxious or stressed.

- Yeah, but my life hasn't been easy lately! I've got an official communication from the company's human resources that I must retire within 180 days. As a rule, this is the deadline for me to plan my departure and train my replacement who is already in the selection process, by the way.

- How cool, Jorge! It's time for you to enjoy life and reap the fruits of your work. You've always given your best to the company and are recognized for your accomplishments, your story will remain a legacy.

Jorge was very tense and did not want to go into details though. Aware that this process would not be easy, he had some idea of how he would feel away from the company. Only that he did not expect it to be right now. After his exercises, he went to the company and had another day of meetings. The meetings lasted more than expected, but his mind was somewhere else. He could only think about the talk he would have with Raquel at noon to tell her the news – he usually avoided telling bad news to his wife at night.

When he got home, the meal was ready and they sat to eat right away. Raquel is used to her husband's habits and, at the end of their lunch, she asks:

- What is going on? You've acting weird for weeks... And today you came home for lunch... it means there is something you want to tell me.

- Yes, you know me too well. The thing is that I'm about to retire, now what?

- What do you mean? Raquel asks.

- I got the news yesterday. According to the company's new rules – which are intended to ensure the employees' wellbeing – those completing 65 must retire. Because of my position, I have six months to do the transition.

- Jorge, what now? What are we going to do?

- I don't know, Raquel! I knew this time would come, but I'm afraid I won't be able to proceed with our plans and dreams, not to mention to keep the quality of life we got used to over all these years.

- You know it's not like that! You'll get a generous employment termination payment, so we can't complain, right? At our age and we never worried about saving money for this moment, but we've lived well... you've always made more than R$10,000 a month, a good salary. We only thought about working and working and never planned for this moment, but it's here.

- Yes, but it wasn't supposed to be now! We're in the middle of a pandemic, with debts that resulted from you closing your store, our grandchild is about to be born, and all the bills we have to pay...

2. The trajectory

Jorge Fagundes is recognized in the business milieu. He is from a time when once an individual got a job in a company, s/he did not think about changing jobs. His colleagues consider him a workaholic because he works more than 10 hours/day and answers emails on Sundays and holidays. Despite his many duties and demanding routine, he is always courteous and in a good mood. Whenever possible, he likes to have a cup of coffee and have an informal conversation. He does not conform to the frowning manager stereotype and considers it essential to learn about what goes on in the company's corridors.

As he is called in the company, Dr. Fagundes is also admired for being in control of a food company for a long time, while the competition replaces managers every 24 months, on average. He was responsible for diversifying products and acquiring companies in the sector – his greatest pride – in a time when the competition did not consider such strategies. Everything ensured his success, leading the company to make a profit. As a result, VRI Alimentos S.A. became a leader in the national market, a very competing sector.

Jorge was born in Salete, a small town with less than 10,000 inhabitants. It is located in the Alto Vale do Itajaí region, SC, Brazil, and its economy is based on pig farming. His father, of Portuguese origin, was one of the largest pig farmers in the state. Jorge was a hardworking son. He studied Business Administration and specialized in an American university.

VRI Alimentos hired Jorge as a trainee immediately upon his return to Brazil. He worked in various sectors: accounting, logistics, and controllership, and was finally sent to the executive management. In this corporate role, he was responsible for diversifying products and accelerating the company's growth through important acquisitions during his tenure in the early 2000s. The result of his administration was so positive that Jorge received several bonuses spent on trips abroad. This period required an extra dose of dedication; however, VRI became the leader in the Brazilian food market, in terms of volume and market share.

On a personal level, Jorge started a family, married Raquel Maria Fagundes 40 years ago, and had two daughters, the 38-year-old twins, Maria Fagundes and Sofia Fagundes. He gets emotional easily when he tells his story and experiences and talks about "the women in his life" – an affectionate way to refer to Raquel and his two daughters. Sofia graduated in Architecture and met a Spanish architect during her specialization in Europe. They married there and are expecting their first daughter to be born on the same day as her grandfather Jorge; the family is bursting with joy. Maria, on the other hand, is the one that resembles her father the most. She graduated in Business Administration and, like her sister, attended a Master's program in Europe. She returned to Brazil a year ago.

Nevertheless, there is something Jorge never worried about, his retirement. He did not have the habit of saving money, much less investing long-term. On the contrary, as he always held important positions in the company, he always received good salaries. He used his earnings to enjoy his spare time, offering comfort and leisure to his family - trying to compensate for not spending much time with his family in everyday life. On the other hand, Jorge has always been very concerned about his daughters' education, and they always studied in the best schools. With such intense life, he never took good care of his health. Hence, five years ago, Jorge had a heart attack and underwent surgery to implant two heart bypasses.

Jorge's wife, Raquel, owned a delicatessen store in the city's mall. For years, this was her occupation and something she liked to do even though the store did not have many customers and was not very profitable. Unfortunately, due to the Covid-19 pandemic, she had to close the store. The downtime due to social distance measures and rent costs and taxes made the store succumb and declare bankruptcy. Nowadays, Raquel takes care of the home. However, closing the store left a trail of labor and tax debts. The sale of the inventory was sufficient to pay the employees' FGTS and INSS. However, the mall's rent and condominium costs were negotiated to be paid in 10 monthly installments, tax debts were distributed in 60 monthly installments, while debts with suppliers are still under negotiation – the first offer was 24 monthly installments, corrected for inflation.

3. Living on the edge

Jorge became a respected and competent professional and was strict with the company's accounts. Everything was different though when it came to his accounts. It does not mean he is a bad payer, but his entire salary is committed to installments and bills.

Raquel likes to dress well and is always in fashion. The salesgirls and managers of the city's designer stores fill her social media with photos and promotions, and not infrequently, her house's living room is filled with bags with clothes to sample. In addition, the family owns an extensive collection of cell phones. Even before these devices present technical problems, newer models replace the outdated ones, ending up in a drawer. However, it does not stop there. Cars are replaced every two years with recent and increasingly modern models. The difference between a used and a new car is always paid in installments. The sellers already know the family's habits and regularly schedule new sales for Mr. Fagundes, considering the latest car models.

Sometimes, the family is unable to make ends meet: the credit card bill is paid overdue. Typically, this problem occurs between October and November. The reason is that the family has many celebrations during these months: Raquel's birthday and the twins' birthday 15 days later. So the manager of Raquel's favorite restaurant calls Jorge and makes a reservation of their usual table, including their favorite sparkling wine for the toast.

The jewelry saleswoman is intimately acquainted with Raquel's good taste. So, she visits her with a suitcase containing the most beautiful and expensive pieces. Of course, the saleswoman's gimmick is:

- *You can pay in ten installments.* She says in a joking mood.

And continues.

- *Hey Raquel. You'll have it paid for before the next birthday!*

As a last resort, the bank manager is always on the lookout. The family has access to fast credit. They sign up for new credit whenever needed without considering the interest rates or terms. The important thing is that the installments stay "within the month's budget". Hence, year after year, Jorge never worried about tomorrow.

4. No man is a prophet in his own land

Maria, the daughter who resembles her father the most, has always observed the family's economic problems and does not like their consumption pattern. However, not by chance, she studied Business Administration and specialized in finances.

Even though she has always been concerned about the out-of-control situation and warned her family many times, she has never been heard. Financial problems were covered up with new loans, and her father's high salary always gave them a false impression that all was well.

When her mother calls and tells her about her father's retirement, Maria feels that that false impression of security will disappear. So she decides to meet her father after work.

- *Good night dad, is everything ok?*
- *Yep, everything is well! Did your mom tell you the news?*
- *Yes, and I'm concerned!*
- *Concerned with what? With my retirement?! I'll get an employment termination payment and FGTS, and everything will be just fine.* Jorge says, outraged by his daughter's reaction.
- *Ok, yeah, but don't forget that you have only a small FGTS balance to receive. Most of it has been used to make the down payment on the beach house.*
- *Yes, I have it all written down, and it's under control.*

- Dad, we've talked about it so many times! That you needed to set aside a portion of your income, whether a portion of your salary or bonuses, and invest it. If you had at least a private pension, your situation would be different now. But you've never listened. It's like the saying goes: No man is a prophet in his own land.

- You know, we could never spare anything. Don't forget that your mom and I are from a time when inflation was out of control. By the way, do you know what was Cruzeiro Novo, Cruzeiro, Cruzado, Cruzado Novo, and Cruzeiro Real? We had to go to the groceries store and stock up on food because the store's employees would change prices twice or even three times a day. Yes, honey, the prices would go up many times on the same day.

- Dad, these are different times! We don't need to spend our entire income because of uncontrolled inflation. It's easier to plan expenses without losing purchasing power, as in the past. You've always earned very well, you could spend it and your preferred buying consumer goods, furniture, cars… You gave us a very comfortable life; this is a fact, but along with it came annual costs and expenses. Not even a portion of it was invested in income-earning resources.

- I know, but we'll adapt, honey! I still don't know what to do, but everything will be all right.

- There's something else, dad. Your credit card is overdue, and there are the loan and financing installments. You are the bank manager's best friend. Now, things will have to change. Maria reminds her father of how easy it is to hire an "expensive" loan.

- Ok, listen, your mom and I very much want to be close to and support our grandchild's first steps, you know, your niece. Now, I don't know how it's going to be after my retirement.

- I understand and support you. But, only so you know, dad, you've always spent more than you make. Other times, you'd call the bank manager to pay off your debt. But now, your retirement income won't pay even your mom's credit card bill.

5. The dilemma

Jorge is on the eve of his departure from the company where he has worked for more than 40 years. For cultural reasons, he did not care about the consequences of retiring one day. Jorge has considerable assets: an apartment, a beach house, and a country house in the rural area of the town where he lives, which he inherited. He has no investments that provide extra income, on the contrary. Moreover, Jorge never planned to sell or lease any of his leisure properties, even more now that he will have more free time after retiring.

At this point, Jorge realizes that the pension provided by the government is not enough to keep his assets, and he does not know how to keep his family's living standards he was able to offer thus far. Due to his experience, other companies have invited Jorge to work as a consultant, even competitors. The competing companies want to replicate the strategies Jorge implemented in his company. However, his cardiologist recommended taking his foot off the gas due to his annual medical checkup results. The stress caused by everyday life, which was exhausting due to his position, worsened his blood pressure, especially in recent months. He already had high blood pressure, which recently demanded heart bypasses. His heart was no longer the same, and, given his history of complications, Jorge was supposed to change his lifestyle. His doctor recommended stopping working; otherwise, he might not see his granddaughter's birth. Even worse, if his blood pressure does not change, he will have to undergo a new surgery, which is very expensive, by the way.

Jorge experiences euphoria, caused by his desire to see his granddaughter's birth and growth. At the same time, the debts knocking at his door and his fragile health cause frustration. He experiences mixed feelings and does not know how to make ends meet. How will he manage to stay close to his family, pay off the debts left by the closing of the delicatessen store, and maintain the current consumption pattern?

There is one thing Jorge cannot change: he will retire soon. With all these facts on his plate, he seeks Maria's help to deal with his long time coming financial problems and asks her for an analysis of his income and financial obligations.

The famous restaurant, where they serve the spaghetti carbonara Raquel loves, was the place Maria chose to present her report. Jorge called the restaurant and set dinner for 7 pm. He checked his schedule and planned to leave the company a little earlier than usual. He wanted to go home and take a shower, expecting Raquel to be ready. So, they went together to the restaurant where Maria was already waiting for them.

Upon arrival, Maria presented her reports and asked her mother's opinion - her father had already read the reports. The mother, always very thoughtful, asked for a few minutes to read the report her daughter had prepared. In the end, Raquel realized that she and Jorge had to make important decisions that would impact the Fagundes' lives for the rest of their days. Still, she was not entirely sure what the couple should do.

So, Maria summarized the situation:

- INSS defines dad's future income. It is estimated at R$4,750.00, which after discounts, will be approximately R$3,917.00. The employment termination payment will be a good amount, though it could be higher, considering that part of the FGTS was used to buy the beach house. Today, it is approximately R$160,000.00. Currently, investments are practically insignificant; there is only R$28,000.00. At the same time, we have negotiated debts that concern the closing of mom's store, many of which are still to be negotiated, adding to approximately R$85,587.00. There are also financing debts that add up to R$17,085.00/mo.

After a brief pause, Maria proceeds.

- There is also my niece to be born, and I know you dream of being there. However, with the Euro exchange rates soaring, a trip to Europe would easily cost you R$50,000.00. Also, a health insurance plan for both of you does not cost less than R$3,250.00/mo. I'm being optimistic, considering that, without a health insurance plan, a new heart surgery, including the doctors' fee and hospital costs, would be at least R$250,000.00.

- Note that the assets accumulated over the years, cars, the apartment, the beach house, and the country house generate only maintenance expenses, with employees, and taxes, among other things. The cost to maintain everything is R$5,687.50/mo.; that is, R$68,250.00/year.

After this explanation, Maria gave her parents the worksheet below, and Jorge received it amid whimpers, putting his hands to his head, he mutters:

- My God, what now? How am I going to make things right so my retirement does not become a nightmare?

Annex

Table 1

Summary of Fagundes' Finances

Income		INSS/IRPF		Net
Retirement income	4.750.00	-832.74		3.917.26
Severance pay				160.000.00
Assets	**Estimate**	**Debts**		**Market value***
AMAROK High.CD 2.0 16V TDI 4X4 Dies. Automatic 2020/2021	225,015.00	-94,506.30	-39,152.61	91,356.09
JETTA R-line 250 TSI 1.4 Flex 16v Automatic 2020/2021	146,011.00	-73,005.60	-21,901.62	51,103.78
Apartment in Itajaí/SC	800,000.00		-400,000.00	400,000.00
Beach house in Garopaga	500,000.00	-123,638.00	-188,181.00	188,181.00
Country house in Salete/SC – Inheritance	680,000.00		-340,000.00	340,000.00
Financial investment	28,000.00			28,000.00
Debts				
VW/Amarok pickup truck - 14 installments of R$ 6,750.45				-94,506.30
VW/Jetta automobile - 20 installments of R$ 3,650.28				-73,005.60
Beach house in Garopaba - 100 installments of R$ 1,236.38				-123,638.00
Debts from the store closing				-85,587.97
Jorge's credit card and debts in 15 installments				-41,696.60
Raquel's credit card and debts in 15 installments				-40,021.70
Budget for Europe trip, granddaughter's birth				-50,000.00
Expenses				
Employees, taxes, and maintenance – Apartment in Itajaí				-3,116.19
Taxes and maintenance – Beach house in Garopaba				-850.00
Employees, taxes, and maintenance – Country house in Salete				-1,721.31
Future expenses				
Unimed Insurance health plan (high complexity)				-3,250.00

*market value = Net equity – Opportunity cost, sale within 30 days

6. Teaching notes

6.1 Data Source

This teaching case was based on the authors' notes and experiences as financial consultants and accountants. It portrays the various passages and experiences the authors have gained over time in their professional lives. Hence, a fictional character was created to depict real-world objectives, portraying more than just a singular case of the Brazilian population. The content composing this case is presented playfully, though the plot departed from real situations reported by clients and colleagues. All character names are fictitious.

6.2 Educational objectives

This study's objective is to promote a reflection upon decisions related to income, expenses, and investment management in the short and long terms. The idea is to make students analyze the case and put themselves in the protagonist's shoes (Jorge Fagundes), and discuss the best alternatives for his family, proposing solutions for the dilemmas presented.

The following solutions are explored:

- Having the goal to regularly save a percentage of monthly income to make timely investments;
- Acquiring real estate that can create solid income sources;
- Opting for a private or individual pension plan;
- Considering higher-risk investments in the financial market; and
- Being an entrepreneur, as a professional, or having a business.

6.3 Suggestions to implement the case

The case was developed to exploit different concepts related to financial education. Because it is a transversal subject, it can be applied in technical courses in business administration, undergraduate courses in business administration, management, and accounting sciences. At other levels of higher education, applying the case is possible in the disciplines of finance, budgeting in financial management, and other related subjects, in addition to other programs addressing personal finance subjects. This case can also be applied in graduate programs, as it usually generates more in-depth debate and is interesting to encourage students to read it in advance (Partyka, De Lima, & Lana, 2021). Professors can apply the activities suggested in Figure 1 to discuss the concepts addressed here.

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Professors could approach and discuss the case in the classroom. The lesson plan suggested here includes discussion questions, as shown in Figure 1.

Task	Suggested Time
Individually read the case and reflect upon it	15 minutes
(Moderator) Present the central dilemma	10 minutes
(Moderator) Gather small groups	5 minutes
Group reflection considering the questions proposed=	30 minutes
(Moderator) The entire classroom discusses potential solutions for the questions proposed.	
- Opening	20 minutes
- Analysis	30 minutes
- Closing	20 minutes
(Moderator) Case closure	20 minutes

Figure 1. Lesson Plan

Source: developed by the authors (2022).

The suggested second lesson plan (Figure 2) presents more details according to each section with assignment questions. In this case, there is no need to read it in advance; ideally, the professor provides seven to ten minutes for the students to read each section. Next, the professor asks three questions related to the respective section to encourage a discussion and facilitate understanding of the story. The students can also read it in groups.

Time	Questions	Section
10 minutes	1. How was Jorge reacting to the news that he would have to leave the company? 2. Do you believe 180 days are sufficient for the company to train another employee? Is this period sufficient for Jorge to understand that he will no longer have a daily job?	The case
15 minutes	1. Does Jorge's expenses justify his and his daughters' lifestyle and choices? Quote the passages. 2. What portion of Jorge's income goes to comfort and family education compared to life's misfortunes?	The trajectory
15 minutes	Is it possible for an administrator to care for keeping his company's accounts up to date but be reckless with his/her personal finances? Comment. What indicators show Jorge's income was not allocated only to comfort and leisure or to the best educational schools?	Living on the edge
20 minutes	How does Jorge justify to his daughter the total expenses of his monthly income? What is the main factor raised by Jorge's daughter for the increase in expenses, considering various material and non-material acquisitions? 3. Is there a way out, considering his daughter's warning that the monthly pension Jorge would receive would not even pay for Raquel's credit card?	No man is a prophet in his own land
15 minutes	List two alternatives that, according to the text, could generate extra income for Jorge. At what point does the family's concern, besides Maria's, become apparent? Is there an easy and fast alternative, considering that Jorge's income will drop by more than 50% and the pension ceiling?	The dilemma

Figure 2. Lesson plan according to section

Source: developed by the authors (2022).

6.4 Questions suggested for discussion

1. How does overconsumption impact personal finances, and how important is financial planning to achieve balance?
2. How can indebtedness and default (and management of such situations) contribute to accumulating income?
3. What actions Jorge could have implemented during his life to ensure a peaceful retirement?
4. Jorge justified his lack of financial organization with the inflationary culture of the late 1980s. How can financial education benefit people like him?

6.5 Analysis suggested for the proposed questions

Question 1

For Lucena and Marinho (2013), personal finances correspond to the management of one's own money. It is about planning and controlling personal income, that is, determining whether financial resources will be allocated to fixed expenses, savings, or investments. The proper use of personal finance guides individuals' decision-making, helping them to achieve financial balance. A lack of education about personal finances may lead people to make decisions that negatively impact their lives (Moreira & Carvalho, 2013). In some cases, people spend more than the resources available, not controlling their budgets and not saving money. These are some of the very common and recurring mistakes leading individuals to lose control over their financial situation.

Lack of financial planning and control leads people to misuse their money. Financial planning enables individuals to make the right financial decisions and ensure financial balance, though control and discipline to manage personal expenses are essential. Dias (2013) states that financial planning is essential to acquire financial independence and build personal assets. Personal financial planning must be guided by objectives, according to the goals established. Thus, the procedures to be adopted will become evident, promoting efficient financial planning.

Dessen (2015) highlights that there is great resistance to planning and financial control, because people usually realize that they do not have enough money to do everything they would like to do. As a result, they do not work on a budget, which would require them to stop shopping. Hence, people continue making purchases, thinking they will be able to pay them off when the time comes. In this sense, Cerbasi (2016) notes that the only way to change such an outcome is by working and planning. The purpose is to establish a practical and objective financial plan, accessible to anyone, to contribute toward the construction of financial prosperity. A lack of planning and discipline, not working as planned, is a common mistake that leads people to remain poor. Therefore, people need to devise a plan and follow it to ensure a prosperous financial future.

According to Mendes (2016), the way personal financial life is planned depends on what an individual has seen and heard about money since childhood. Thus, the development of a financial mindset that forms in adulthood is based on childhood experiences. Therefore, financial planning must be discussed from a very early age, so that knowledge of this subject is improved throughout an individual's existence. Financial planning is easy to implement if it comes from financial education provided with information and guidance to facilitate understanding.

Question 2

Indebtedness occurs when a consumer intends to pay on time but is unable to. A consumer is considered in default when s/he is unable to honor her/his debts. Dias (2013) considers that personal indebtedness is linked to the way an individual manages his/her income and expenses, and occurs due to a lack of financial planning and overconsumption. In a quest for status, people sometimes compromise their finances to meet high consumption standards imposed by the social groups to which they want to belong.

According to Carla (2021), payment default concerns "the non-payment of a bill or debt. Thus, a defaulting consumer is someone with outstanding debt." Usually, it occurs when there are loans and financing contracts with installments to be honored. According to Dessen (2015, p. 102), "approximately 60% of the Brazilian families have debts via post-dated checks, credit cards, overdrafts, point-of-sale financing, personal loans, or car and insurance installments". Nothing is wrong there because people usually use the resources available to proceed with their life projects. The problem emerges when people do not plan how they are going to use these resources and compromise their families' income, delaying payments, and creating new debts to pay the existing ones. An absence of financial education in Jorge Fagundes' life compromised the management of his personal finances. Reckless behavior due to a lack of financial planning and control impedes individuals from progressing financially, hindering the achievement of goals.

Question 3

Macedo Junior (2007) reinforces this idea, explaining how important it is for people to have concrete, realistic, and achievable goals, i.e., specific objectives that are measurable, predictable, and can be prioritized. Hence, individuals must know what they want, when they want it, and how long it will take for them to achieve it. It is important to know the top priorities, while also acknowledging existing debts and financial obligations, a task facilitated by having a balance sheet.

The financial market usually offers various alternative investments, with advantages and disadvantages, in the short, medium, and long terms. Figure 2 lists the most common advantages and disadvantages of the main types of investments available in the Brazilian financial market.

Savings account

- Exempt from income tax
- Daily liquidity
- Low risk. Guaranteed by the FCG

- Low profitability
- Remuneration only on the investment's anniversary

*Credit Guarantee Fund - investments of up to R$250,000.00 are guaranteed per individual and financial institution.

- Good for individuals who wish availability and security. Contingency bookings, Short-term plans.

Source: Febraban (2019, p. 17).

Bonds

- Usually more profitable than a savings account
- There is an expert (manager) to make decisions

- Income Tax and IOF are collected upon redemption
- *CGF does not provide any guarantees
- In most cases, liquidity is not daily
- An administration fee is collected

*Credit Guarantee Fund - investments of up to R$250,000.00 are guaranteed per individual and financial institution.

- Good for individuals who want returns higher than a savings account and more flexibility to make withdrawals. Medium-term plans.

Source: Febraban (2019, p. 17).

CDB – Bank Deposit Certificate

- Usually is more profitable than a savings account
- Returns always higher than the amount invested
- Low risk. Guaranteed by the CGF*

- Income tax and IOF are collected on redemption
- Withdrawing before the expiration decreases returns

*Credit Guarantee Fund - investments of up to R$250,000.00 are guaranteed per individual and financial institution.

- Good for individuals who want returns higher than a savings account and do not intend to withdraw before the expiration date. Medium-term plans.

Source: Febraban (2019, p. 17).

Treasure Securities

- Minimum risk (100% guaranteed by National Treasury)
- Profitability greater than a savings account
- Investments starting at BRL 30.00

- Income Tax and IOF are collected upon redemption
- Selling before the expiration date may provide null return

- Good for individuals with little money to invest, but who want returns higher than a savings account and do not intend to withdraw before the expiration date.

Source: Febraban (2019, p. 17).

Bond Funds or Multimarket funds

- Expected return higher than a savings account (no guarantees)
- There is an expert (manager) to make decisions
- Different investment alternatives

- Income Tax and IOF are collected upon redemption
- No FCG guarantees
- Higher maintenance costs
- Uncertain profitability (returns may be negative)
- In most cases, no daily liquidity

- Good for individuals who want to diversify investments and are already experienced and have a surplus of resources. Long-term plans

Source: Febraban (2019, p. 17).

Stocks

- High liquidity
- There are opportunities to earn more than bonds
- Does not require much money to invest
- Dividends – companies' profit sharing

- High oscillation index
- Costs: income tax, brokerage, escrow and other fees
- Complex market to find good opportunities

- Good for individuals who want to diversify investments, are already experienced and have a surplus of resources. Long-term plans.

Source: Febraban (2019, p. 17).

Figure 2. Advantages and disadvantages of financial investments in Brazil

Source: Developed by the authors based on Febraban (2019).

There are other investment options besides investing in real estate, something that Jorge was used to, though unpretentiously, as he never considered it a source of income – instead, it was a source of his and his family's leisure. However, these other options would require Jorge to have more knowledge of the financial market, or his daughter would have to provide greater support, helping him allocate and reallocate capital depending on profitability levels, such as real estate funds. For Fortuna (2005, p. 501), a real estate investment fund" [...] is an investment that has the security of a property combined with the liquidity of securities". Here, the author notes the advantage of this type of investment: security, liquidity, and profitability. To better understand the profitability of this type of investment, we should keep in mind that investors benefit twice: i.e., by earning monthly rent and also when quotas appreciate. According to Halfeld (2008, p. 102), "partners receive quotas they can sell on to new interested parties. Rental income and real estate appreciation generate gains."

Question 4

D'Aquino (2008, p. 8) notes, "for at least two decades, Brazil was the stage of an unbelievable inflationary nightmare." There were eight currency changes between 1942 and 1994, six of which happened within twenty years. As a result, society established a distrustful relationship with money and faced difficulties controlling consumption impulses. Additionally, the Brazilian population never had access to a solid financial education; hence, its importance in children's school education.

A lack of access to financial information and knowledge leads to unwanted consequences: mistaken decision-making and lack of financial planning and information, which hinders the lives of part of the population. Richard Thaler, Nobel Prize in Economics, stated that human beings are not rational 100% of the time. Young people, for instance, have difficulty visualizing themselves in the long term and, for this reason, find it challenging to establish medium and long-term goals (Decker, 2017). In this sense, financial education emerges as a means by which individuals can learn to make good use of money, that is, learn how to make conscious and financially sustainable decisions. Such knowledge can impact society economically, socially, and environmentally through, for example, conscious consumption.

A safe path to retirement is to save or invest a portion of income every month from the very first salary (Decker, 2017). Hence, financial education aims at a balanced relationship between individuals and money, expanding their decisions and choices in the short, medium, and long terms. As a result, financial education "should be seen as a set of healthy financial habits that contribute to improving people's lives, income, and financial prospects" (Modernell, 2011, p. 22).

Jorge could use the 50-30-20 rule (or its more conservative version, 50-15-35), with 50% of income allocated to pay for essential expenses, 30% for variable expenses (or 15%) – such as leisure and superfluous, and 20% to save and invest (or 35%) (Leite, 2021; Equipe Infomoney, 2019). Thus, before delving more deeply into the concept of financial education in Brazil and its progression in recent years, one has to understand the characteristics of education as a whole in the country.

6.6 Case closure

Because this is a transversal subject applicable from technical and vocational education to graduate programs, moderators are encouraged to present and intervene in the main suggestions and conjectures suggested here to promote the development of financial education and personal finances management among Brazilians.

Financial education has reached a transversal level in Brazil and is particularly important for all disciplines. According to the Organization for Economic Co-operation and Development (OECD, 2005), financial education is how individuals and societies improve their understanding of financial concepts and products. However, because of a lack of contact with financial planning and this type of education, many individuals become involved in complicated situations, acquiring financial obligations greater than their financial capacity.

According to the National Curricular Parameters (PCNs), teaching fields are addressed in a specific manner to show students the individual relevance of each area. It does not impede these fields from being integrated though. Transversal topics are associated with disciplines dealing with relevant social issues, such as ethics, health, environment, sexual orientation, and cultural plurality (BRAZIL, 1998). Considering this aspect, we sought to address issues related to financial education without restricting it to a single field. By introducing tasks that address financial education from early education, students are more likely to acquire healthy economic and financial habits to practice in their social lives (Pregardier, 2015).

Finally, because this subject refers to real-world experiences; thus, professors are supposed to interconnect these experiences to the context of each discipline. Interdisciplinarity will elicit curiosity among the students regarding related subjects.

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Does environmental expenditure depend on financial slack? A longitudinal study in Brazil

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Abstract

Objective: To evaluate whether environmental expenditures are influenced by financial slack among publicly held Brazilian firms.

Methods: The sample included 53 firms traded on B3, presenting environmental expenditures between 2008-2018, totaling 308 observations. Environmental spending was used as the dependent variable and financial slack was the independent variable, proxied by three metrics: cash and cash equivalents, operating cash flow, and spending/investment capacity (KZ index) (Kaplan & Zingales, 1997). Pooled ordinary least squares estimations were performed, controlling for fixed effects according to industry and year, and other control variables. Time lagging was used.

Results: The main findings show a persistent and negative association between environmental spending and financial slack expressed in cash and cash equivalents. When financial slack was expressed with the more comprehensive KZ index, the association was positive but not persistent.

Contributions: By evidencing the influence of financial slack on the willingness of firms to engage in environmental expenditure, this study contributes to both academic and corporate audiences. Hence, these results indicate a correlation between corporate financial health and the allocation of funds to environmental causes.

Keywords: Financial constraints. Environmental spending. Stakeholders.

1. Introduction

The supposed relationship of dependence between environmental expenditures and financial slack permeates the conflict between those who defend the Stakeholder Theory and Shareholder Theory. On the one hand, it is acknowledged that a company's objectives should align with emerging environmental problems (Freeman, 1994; Heikkurinen & Bonnedahl, 2013; Iatridis, 2013; Middleton, 2015; Vellani & Nakao, 2009). However, on the other hand, there is resistance to financing environmental actions that, according to current thought, are not essential for a business (Fatemi, Fooladi, & Tehranian, 2015; Friedman, 1970; Hassel, Nilsson, & Nyquist, 2005; Jaggi & Freedman, 2015; Friedman, 1970; Hassel, Nilsson, & Nyquist, 2005; Jaggi & Freedman, 1992).

In this sense, the different stakeholders monitor environmental expenditures for different purposes. While some are concerned with expenditure on environmental preservation, control, and recovery, others focus on the company's ability to finance such expenses without compromising the company's operational efficiency (Derwall, Koedijk, & Horst, 2011; Fatemi et al., 2015).

Therefore, financial slack becomes an important strategic variable, highlighting the management's ability to allocate resources to activities considered non-operational. It also serves as an indicator of capitalization (sacrifice) of scarce resources (Daniel, Lohrke, Fornaciari, & Turnr, 2004; Jaggi & Freedman, 1992; Shahzad, Mousa, & Sharfman, 2016; Waddock & Graves, 1997).

According to Lys, Naughton, and Wang (2015), environmental expenditures occur when a firm's management prospects solid financial performance, supporting the thesis that "corporate charity" is sustained only when there is a financial surplus.

The literature (Boso et al., 2017; Campbell, 2007; Daniel et al., 2004; Hong, Kubik, & Scheinkman, 2012; Waddock & Graves, 1997) indicates that as financial slack grows, so does the company's willingness to make environmental expenditures.

It may be true, especially in the case of emerging economies such as Brazil. Scarce resources and financial constraints, a search for accelerated economic growth, and limitations arising from the institutional environment (e.g., restriction to capital and weak capital market development) are barriers to carrying out environmental expenditures (Boso et al., 2017; Lee, 2015).

Given the previous discussion, this study examines whether environmental expenditure is influenced by financial slack within the scope of publicly traded Brazilian companies, considering the firms listed on B3 S/A Brasil, Bolsa, Balcão. The sample comprised 53 companies presenting environmental expenditures between 2008-2018, totaling 308 observations.

The results show that financial slack based on cash and cash equivalents negatively affects spending, and this relationship is persistent. On the other hand, financial slack based on the comprehensive index proposed by Kaplan and Zingales (1997) positively affects environmental expenditure, with no evidence of persistence. The conclusion is that financial slack can influence environmental expenditures. Thus, financing environmental actions involves analyzing a firm's financial situation, but the management's final decision depends on the aspect of the slack considered in this assessment. The influence of an indicator of ample financial slack suggests an intimate relationship between economic and environmental sustainability.

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Does environmental expenditure depend on financial slack? A longitudinal study in Brazil

This study is justified by the need to bridge the view defended by the Stakeholder Theory with the thesis conceived by the Shareholder Theory. This study offers a significant theoretical contribution by relating environmental expenditures with financial slack in publicly traded companies in an emerging economy. It reports elements that mediate the preexisting conflict about a business' actual utility function, aligning owners' interests with those of other stakeholders. This study's practical contribution consists in showing that the information alluding to environmental performance must be the object of internal (measurement, report of the generated impacts - accounting and management) and external attention (financial impact and financing capacity). The correlation between environmental expenditures and financial slack suggests that these numbers must have informational utility.

2. Hypothesis Development

Environmental expenditure is defined as an economic sacrifice channeled to finance activities or assets to prevent, correct, or repair environmental impacts caused by a company. Environmental expenditure is adopted in the literature as a proxy for environmental performance because it reflects the firm's ability to decrease environmental risks, indicating its performance in this dimension (Clarkson, Li, & Richardson, 2004; Iatridis, 2013; Lys et al., 2015; Mayor & Martel, 2015).

Some studies argue that environmental expenditure is influenced by higher levels of financial slack (Campbell, 2007; Hong et al., 2012; Lys et al., 2015; McGuire, Sundgren, & Schneeweis, 1988; Surroca, Tribó, & Waddock, 2010; Waddock & Graves, 1997). Thus, a financial surplus would explain a company's diversifying objectives, focusing on non-essentially operational activities.

Financial slack can be defined as the available or potential generation of cash, which financially supports activities that can generate some kind of return for the firm and its investors (Daniel et al., 2004; Wruck, 1990).

According to Boso et al. (2017), the literature has not found a consensus on the relationship between environmental expenditure and financial slack. The results are inconclusive on environmental expenses resulting from greater availability of resources based on the financial slack. Approaches to this matter focusing on stakeholders and shareholders are the most predominant (Boso et al., 2017; Jaggi & Freedman, 1992).

Other studies (Lys et al., 2015; Nelling & Webb, 2009; Qiu, Shaukat & Tharyan, 2016) argue that environmental expenditure indicates a forecast of solid future economic and financial performance. From this perspective, environmental expenditure has a purely economic utility, contrary to the idea of corporate charity. According to D'Souza (2020), socio-environmental interests cannot be excluded from this purpose, considering the objective of maximizing results and shareholder wealth.

On the one hand, the company may not survive if it ignores demands arising from the context in which it operates – such as those of an environmental nature. On the other hand, however, some impending contextual matters may conflict with a business purpose. Thus, heeding such matters and specific interests may result in financial restrictions, delaying projects that generate profits. Moreover, such a choice may harm a company's survival (Pfeffer & Salancik, 1978).

According to Boso et al. (2017), McGuire et al. (1988), Shahzad et al. (2016), and Waddock and Graves (1997), this problem applies to environmental expenditures, which generally depend on management discretion. The company may adopt environmentally responsible practices not necessarily because it believes in the added value of these actions but only because of stakeholder pressure (Machado, Machado, & Santos, 2010).

Although the literature suggests that companies invest more in environmental responsibility when there is greater availability of financial resources (Campbell, 2007; Hong et al., 2012; Shahzad et al., 2016; Waddock & Graves, 1997), there is not a consensus on the relationship between environmental expenditure and financial slack.

Some studies (Campbell, 2007; Daniel et al., 2004; Hong et al., 2012; Waddock & Graves, 1997) suggest that decreased financial slack may lead the company to prioritize essential activities related to its economic purpose, to safeguarding the interests of shareholders (Friedman, 1970; Jaggi & Freedman, 1992).

Assuming financial slack as a measure of organizational flexibility (Boso et al., 2017; Campbell, 2007; Hong et al., 2012; Julian & Ofori-Dankwa, 2013; Lys et al., 2015; Wruck, 1990), there is a potential connection between decreased environmental expenditures and variation in a company's financial condition. These studies argue that companies engage in environmental expenditures due to a more significant financial slack. The reason is that there is greater flexibility to allocate cash to activities that are essentially different from the company's primary economic activity.

In this context, environmental expenditures would depend on financial surplus, as they represent a waste of corporate resources (Lys et al., 2015), as suggested by the Theory of the Firm, focusing on shareholders. Coupled with this is the fact that environmental expenditures do not necessarily ensure the generation of future economic benefits (Borghesi, Houston, & Naranjo, 2014; Derwall et al., 2011), leading some investors to avoid environmentally responsible companies.

According to the Theory of the Firm, shareholders consider environmental expenditures to indicate the firm's decreased value (Hassel et al., 2005; Jaggi & Freedman, 1992). Therefore, investors seek information to ensure that such expenditure can be financed and does not jeopardize future cash flows.

The Stakeholder Theory suggests that there are also value-driven investors. In these cases, environmental expenditures can be considered a variable that indicates future economic benefits (Iatridis, 2013; Lys et al., 2015). Nevertheless, Hong et al. (2012) understand that a company's financial condition should always be examined.

Therefore, the level of financial slack may limit environmental and related expenditures whether they have economic motivations or altruistic reasons. The lower the financial constraint, the greater the propensity to invest, and it may suggest better future performance (Daniel et al., 2004; Hong et al., 2012; Waddock & Graves, 1997).

Therefore, the level of financial slack may limit environmental and related expenditures, whether they have economic motivations or altruistic reasons. The lower the financial constraint, the greater the propensity to invest, which may suggest better future performance (Daniel et al., 2004; Hong et al., 2012; Waddock & Graves, 1997).

Given the above, it is assumed that prioritizing profit and maximizing shareholder value would force environmental "divestment". Hence, financial slack would indicate an investment opportunity, a chance to achieve positive future performance, or ensure financial availability for environmental expenditures (Campbell, 2007; Hong et al., 2012).

Despite the argument of organizational flexibility as a contingency of environmental expenditures, business stakeholders may not favor increased financial slack.

Borghesi et al. (2014) and Shahzad et al. (2016) note that financial surplus can induce managers' opportunistic behavior. In this case, discretion may negatively affect the assessment of investors little interested in environmental causes (McGuire et al., 1988; Shahzad et al., 2016).

Along these lines, Aldrighi and Bisinha (2010) understand that a variation in the availability of internal resources interferes with the effective level of investments in strategic areas. However, market opportunities are strong antecedents of such variations.

Considering the characteristics of Brazil, which is restricted in terms of economic development and dependent on the improvement of governance structures, investors may not consider increases in the level of financial slack positive because this could be interpreted as idle resources and an increase in opportunity costs (Aldrighi & Bisinha, 2010; Kim & Bettis, 2014).

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Does environmental expenditure depend on financial slack? A longitudinal study in Brazil

Cheng, Ioannou, and Serafeim (2014) and Zhang et al. (2018) state that environmental performance is associated with low levels of financial constraint, corroborating the notion that financial slack, a measure of organizational flexibility, would encourage environmental spending. However, Boso et al. (2017) and Julian and Ofori-Dankwa (2013) present divergent results.

Barnett and Salomon (2012), Bhandari and Javakhadze (2017), Fatemi et al. (2015), Fujii, Iwata, Kaneko, and Managi (2013), and Pekovic, Grolleau and Mzoughi (2018) present evidence that there is an optimal level of environmental expenditures that managers should pursue to avoid compromising the company economically and financially.

Considering the economic characteristics of emerging economies (Boso et al., 2017), which would prevent companies from prioritizing environmental expenditures, this study expects that such expenditures will become prominent in the face of favorable financial conditions (Campbell, 2007; Waddock & Graves, 1997). Therefore, the following hypothesis is proposed:

H_1: Environmental expenditure is positively affected by financial slack.

3. Method

Data from the companies in the sample are made available by Thomson Reuters™ secondary database. This study's universe covers the Brazilian capital market, considering the firms listed on B3 S.A. Brasil, Bolsa, Balcão. The sample comprises companies that recorded environmental expenditures in the 2008-2018 period.

Of the 410 companies in the secondary base, 53 (12.9%) presented environmental expenditures in at least one of the years analyzed, totaling 308 observations.

This timeframe was chosen for two reasons: to maximize the volume of data and because it coincided with the period when the new accounting standard came into effect in Brazil. The first year of the period (2008) is when Brazilian accounting standards converged to the International Financial Reporting Standards (IFRS), in compliance with the provisions of Law No. 11,638, from December 28th, 2007, which amended Law No. 6,404, from December 15th, 1976, called "*Lei das Sociedades por Ações*" [Brazilian Corporation Law], with technical pronouncements issued by the Accounting Pronouncements Committee (CPC). In turn, 2018 corresponds to the last accounting year, and the financial statements had been published up to the data collection.

Equation 1 is used to test the hypothesis.

$$GA_{i,t} = \beta_0 + \beta_1 FF_{i,t} + \beta_2 Size_{i,t} + \beta_3 Age_{i,t} + \beta_4 ROA_{i,t} + \beta_5 IND_{i,t} + \beta_6 \sum_{2010}^{2018} YEAR_{i,t} + \varepsilon_{i,t} \text{ (Equation 1)}$$

$GA_{i,t}$ is the first variable of interest and represents the environmental expenditure of firm i in year t equated to the net revenue of company i in year t; measure based on Boso *et al.* (2017) and Pekovic *et al.* (2018). This approach assesses the magnitude of the financial effect of environmental expenditure on the company's main source of income.

The model was also considered from the perspective of a one-year time lag for $GA_{i,t}$, that is, $GA_{i,t+1}$, to verify the persistence of the correlation.

One of this study's limitations is the fact that this variable does not discriminate between expenses, costs, investments, and environmental losses, as the database does not provide this level of detail.

$FF_{i,t}$ is the second variable of interest and represents the measure of financial slack of company i in year t. Some studies (Daniel et al., 2004; Hadlock & Pierce, 2010; Kaplan & Zingales, 1997; Lee, 2015; Li, Li, & Zhang, 2006; Shahzad et al., 2016) indicate that, as a construct, financial slack presents different variants. Thus, one can investigate the ability to finance marginal expenditures (investments), considering multiple aspects that indicate a company's better/worse financial condition.

In this study, financial slack is considered from three perspectives: availability, cash generation, and financial constraint (Daniel et al., 2004; Lamont, Polk, & Saá-Requejo, 2001; Lee, 2015). Thus, the variable is represented by $FF1_{i,t}$, $FF2_{i,t}$ and $FF3_{i,t}$, in this sequence. The first two variants consider the firm's unique aspects. Proxy $FF1_{i,t}$ comprises cash and cash equivalents in relation to the Assets of company i in year t. $FF2_{i,t}$ assumes the value of the operating cash flow equated by the Assets of company i in year t.

The suggested proxies are based on the literature addressing the effect of financial slack on firms' investments and strategies and the relationship with equity price and returns, citing Bhandari and Javakhadze (2017), Burke and Wieland (2017), Daniel et al. al. (2004), Kaplan and Zingales (1997), Khatami, Marchica and Mura (2015), Kim and Bettis (2014), Lamont et al. (2001), Lee (2015), Lys et al. (2015), Qiu et al. (2016) and Shahzad et al. (2016).

The third approach, $FF3_{i,t}$ is based on the metric called $KZ\ Index_{i,t}$, which assesses financial slack from a comprehensive perspective. It combines several indices to classify firms according to their ability to make expenditures/investments (Kaplan & Zingales, 1997; Lamont et al., 2001). $KZ\ Index_{i,t}$ was used by Baker, Stein, and Wurgler (2003), Cheng et al. (2014), Iatridis (2013), Lamont et al. (2001), and Li et al. (2006).

$KZ\ Index_{i,t}$ assumes that measures based on cash and cash flow are proxies for future investment opportunities because, at a satisfactory level, they lead to the timely application of resources in more profitable alternatives (Kaplan & Zingales, 1997). $KZ\ Index_{i,t}$ is measured according to Equation 2 (Kaplan & Zingales, 1997; Lamont et al., 2001).

$$KZ\ Index_{i,t} = -1{,}002FC_{i,t} - 39{,}368DIV_{i,t} - 1{,}135C_{i,t} + 3{,}139PE_{i,t} + 0{,}283Q_{i,t} \qquad \text{(Equation 2)}$$

$FC_{i,t}$ refers to operating cash flow; $DIV_{i,t}$ corresponds to dividends; refers to cash; and $PE_{i,t}$ represents Liabilities, all of company i in year t. $FC_{i,t}$, $DV_{i,t}$, $C_{i,t}$ and $PE_{i,t}$ were adjusted by $Total\ Assets_{i,t-1}$; $Q_{i,t}$ is a proxy for future investment opportunity and represents the market value plus the Liabilities Divide by $Total\ Assets_{i,t-1}$.

The higher the value of $KZ\ Assets_{i,t}$, the greater the restriction the company may face (Kaplan & Zingales, 1997). To make the proxy mathematically consistent in models $FF1_{i,t}$ and $FF2_{i,t}$, $KZ\ Index_{i,t}$ was multiplied by –1. Thus, the larger $FF1_{i,t}$, $FF2_{i,t}$, and $FF3_{i,t}$, the higher the level of financial slack. Khatami et al. (2015) and Lamont et al. (2001) performed a similar adjustment.

The other proxies are used to control the model and are based on Iatridis (2013), Lys et al. (2015), Nelling and Webb (2009), Orlitzky, Schmidt, and Rynes (2003), Qiu et al. (2016), Shahzad et al. (2016) and Zhang et al. (2018), which are aligned with this study's objective.

Thus, according to Equation 1, variable $Size_{i,t}$ is measured using the natural logarithm of Assets of company i at time t. β_3 is expected to be statistically significant and positive, suggesting that larger companies spend more on the environment.

Variable $Age_{i,t}$ is measured by the natural logarithm of the number of years since the foundation of company i. In this case, β_4 can be positively or negatively statistically significant. The relationship between maturity and environmental commitment is nuclear.

Variable $ROA_{i,t}$ is calculated by the quotient between the net income and the Assets of company i at time t. The expectation is that will be statistically significant and positive. As a result, higher economic returns would encourage environmental expenditures.

The dummies $IND_{i,t}$ and $YEAR_{i,t}$, were included to control fixed effects by sector and year, as in Baboukardos (2018) and Matsumara, Prakash, and Vera-Muñoz (2014). $IND_{i,t}$ identifies whether the company is part of a potentially polluting industry according to Law No. 10,165, from December 27th, 2000 (Política Nacional do Meio Ambiente); some studies support that such industries spend more on the environment (Clarkson et al., 2004; Clarkson, Fang, Li, & Richardson, 2013; Cormier & Magnan, 2007; Rover, Tomazia, Murcia, & Borba, 2012). $YEAR_{i,t}$ identifies the period.

To perform the proposed models, multiple linear regression estimations were performed with panel data using Pooled Ordinary Least Squares (POLS), including dummies by industry and year, to control the fixed effects of this order. Thus, each company in each year was considered a unit of analysis, generating a large cross-section.

Similar to Baker et al. (2003), continuous variables were winsorized at the 1st and 99th percentiles to reduce the influence of outliers in the sample. The tests described were performed using the STATA® software version 13.0. The models' Heteroscedasticity, multicollinearity, and endogeneity were verified.

4. Results

4.1 Descriptive analysis

The annual quantitative distribution of companies with environmental expenditures in the period analyzed is highlighted (Figure 1).
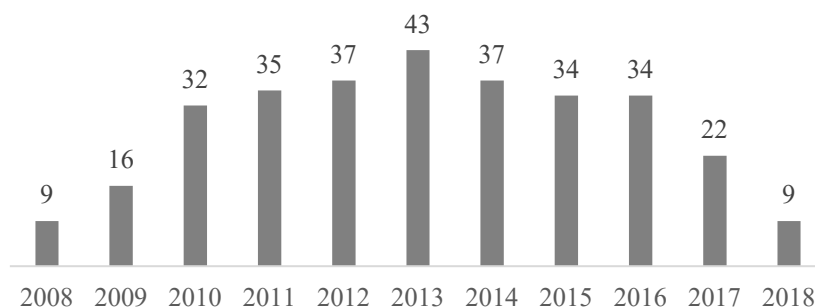

Figure 1. Annual quantitative distribution of the companies in the sample with environmental expenditures recorded in the 2008-2018 period.
Source: developed by the authors.

This context suggests that the longitudinal section can be examined at two points in time. First, between 2008 and 2013, there was an annual growth in the number of companies with environmental expenses, from 9 to 43 (377.8%). In turn, there was an inverse trend from 2014 onwards, dropping from 43 to 9 companies (79.1%) by the end of the period.

Some studies (Derwall et al., 2011; Heikkurinen & Bonnedahl, 2013; Mayor & Martel, 2015) suggest that greater engagement with environmental management, which would lead to more environmental expenditures, is due to two main factors: more sensitized markets and environmental risks and their effects on income and equity.

Note that no legal or regulatory framework in Brazil justifies the periods of increase/decrease identified between 2008 and 2018. The economic recession that hit Brazil in 2009, and aggravated in 2015, is perhaps one of the factors behind such a decline in the second half of the period (Martins & Paulo, 2016).

Consequently, the "crisis effect" would support the notion that emerging economies face greater difficulty or are less interested in financing environmental expenditure due to the country's economic and institutional aspects (Boso et al., 2017).

It is worth noting that studies addressing companies operating in Brazil indicate that, despite improvements, the informational level in the environmental dimension is still insufficient or unclear to investors (Gomes, Rebouças, Melo, Silva, & Santos, 2019; Vasconcelos & Pimentel, 2018).

Table 1 shows the distribution of the observations considering environmental expenditures and industries according to their polluting potential as of Law No. 10,165/2000.

Table 1

Environmental expenditures and polluting potential of economic sectors

	High polluting potential sector	Other sectors	Total
No. of observations of environmental expenditures between 2008-2018	82	226	308
Proportion of observations of environmental expenditures between 2008-2018 (%)	26.6	73.4	100.0

Source: developed by the authors.

Mayor and Martel (2015) and Vellani and Nakao (2009) explain that firms' environmental expenditures are related to the conservation, protection, minimization, and/or correction of environmental impacts arising from their respective economic activities. This assumption justifies the findings of Clarkson et al. (2004, 2013) and Jaggi and Freedman (1992); however, it was not identified in this sample. More than 70% of environmental expenses refer to companies operating in industries with a medium or small polluting potential. It may indicate that the environmental issue would permeate different companies in the most different economic sectors, also considering some aspects of environmental performance. On the other hand, environmental expenditures may indicate financial accountability for previous actions.

According to Law No. 10,165/2000, which provides for the *Política Nacional do Meio Ambiente* [National Environmental Policy], the following are industries with high polluting potential: i) extraction and treatment of minerals (e.g., well drilling and production of oil and natural gas); ii) metallurgical industry (e.g., steel and steel products); iii) pulp and paper industry (e.g., pulp, paper and cardboard manufacturing); iv) leather and skins industry (e.g., manufacturing of various leather and skin artifacts); v) chemical industry (e.g., production of substances and manufacture of chemical products); and vi) transport, terminals, warehouses and trade (e.g., transport of dangerous goods, transport by pipelines, ports).

The potentially polluting firms in this study's sample spent with the environment, but those conducting environmental expenditures do not necessarily belong to an industry with high polluting potential. According to Rover et al. (2012), a company's sector is no longer a determining factor in environmental practices when institutional aspects, such as the recognition of sustainable firms and sustainability reports, are taken into account.

Table 2 presents the descriptive statistics and the correlation test between the variables to test the hypothesis.

Table 2
Descriptive statistics of the variables in the models and correlation test

Panel A: Descriptive statistics						
Variable	No. of observations	Mean	Standard Deviation	Minimum	Median	Maximum
(1) $GA_{i,t}$	308	0.0086	0.0123	5.1E-07	0.0047	0.0696
(2) $FF1_{i,t}$	308	0.0876	0.0742	3.0E-05	0.0650	0.3184
(3) $FF2_{i,t}$	308	0.0828	0.0587	-0.0350	0.0777	0.2781
(4) $FF3_{i,t}$	308	-1.1397	1.8199	-4.9574	-1.2690	6.5083
(5) $Size_{i,t}$	308	23.4401	1.4493	21.1943	23.2199	26.8696
(6) $Age_{i,t}$	308	3.6052	0.7270	1.9459	3.8712	5.3181
(7) $ROA_{i,t}$	308	0.0445	0.0592	-0.1327	0.04184	0.2309
Panel B: Correlation test						
	(2)	(3)	(4)	(5)	(6)	(7)
(1)	-0,0998	-0,1023	0,0458	-0,0190	0,02189	-0,0827
p-value	*	*	NS	NS	***	NS
(2)		0,0584	-0,0684	-0,0319	0,0814	0,0366
p-value		NS	NS	NS	NS	NS
(3)			0,6118	-0,2683	-0,2303	0,5097
p-value			***	***	***	***
(4)				-0,2853	0,6730	-0,1323
p-value				***	***	**
(5)					0,4221	-0,2651
p-value					***	***
(6)						-0,0778
p-value						NS

Note: Variables 1 and 2 in the minimum column appear in scientific notation because they have very low values.
(***) significant at 1%; (**)significant at 5%; (*)significant 10%.
NS = non significant.
Legend: $GA_{i,t}$ – environmental expenses; $FF1_{i,t}$ – financial slack based on availabilities; $FF2_{i,t}$ – financial slack based on cash generation; $FF3_{i,t}$ – financial slack based on financial constraint; $Size_{i,t}$ – size; $Age_{i,t}$ – age; $ROA_{i,t}$ – return on assets.
Source: developed by the authors.

The range of environmental expenditures is high (from less than 1% to almost 7% of revenues) even though the number of observations has grown in the period's first window (2008-2013). The same behavior is observed in the proxies of financial slack. The correlation tests reveal that, in this group, environmental expenditures have a statistically significant but weak correlation with financial slack based on cash measures – cash and cash equivalents and operating flow. Among the controls, there is a correlation only between environmental expenditures and maturity.

Environmental expenditures (are infrequent among Brazilian firms listed on B3. Only 53 firms were identified with this type of expenditure. Additionally, it appears that the impact of these expenditures on revenues is small. Over the 11 years analyzed, the highest average percentage refers to 2009, recording 1.14% of company revenues, followed by 2015 (1.02%) and 2008 (1.08%). The lowest averages are observed in 2018, 2010, and 2016: respectively, 0.58%, 0.064%, and 0.074%.

Comparatively, Boso et al. (2017) analyzed companies in Nigeria, reporting an average of 6% of environmental expenditures of revenues. Pekovic et al. (2018) indicate an average of 20% in the companies in France. Baboukardos (2018) states that emerging countries face more significant barriers to financing environmental sustainability as they seek to advance economic development (Boso et al., 2017).

Regarding the proxies of financial slack, measures $FF1_{i,t}$ and $FF2_{i,t}$, based on cash and operating cash flow, represent between 8% and 9% of the Asset's value on average. With average negative $FF3_{i,t}$, as well as the median (-1.27), several companies are not in better financial condition. Note that the period analyzed is sufficiently large, and captures several changes in the market.

4.2 Hypothesis testing

Table 3 presents the analysis's results concerning the relationship between financial slack and environmental expenditures among the companies in the sample.

Table 3

Relationship between environmental expenditures and financial slack

Model 1	$GA_{i,t} = \beta_0 + \beta_1 FF_{i,t} + \beta_2 Size_{i,t} + \beta_3 Age_{i,t} + \beta_4 ROA_{i,t} + \beta_5 IND_{i,t} + \beta_6 \sum_{2010}^{2018} YEAR_{i,t} + \varepsilon_{i,}$					
Model 2	$GA_{i,t+1} = \beta_0 + \beta_1 FF_{i,t} + \beta_2 Size_{i,t} + \beta_3 Age_{i,t} + \beta_4 ROA_{i,t} + \beta_5 IND_{i,t} + \beta_6 \sum_{2010}^{2018} YEAR_{i,t} + \varepsilon_{i,}$					

Variables	Parameters					
	Model 1a	Model 1b	Model 1c	Model 2a	Model 2b	Model 2c
Constante	0.04***	0.04***	0.03***	0.05***	0.05***	0.04**
t	(3.45)	(3.27)	(3.07)	(2.82)	(2.64)	(2.48)
$FF1_{i,t}$	-0.02***	-	-	-0.03***	-	-
t	(-3.06)	-	-	(-2.61)	-	-
$FF2_{i,t}$	-	-0.01	-	-	-0.02	-
t	-	(-0.95)	-	-	(-1.17)	-
$FF3_{i,t}$	-	-	0.001***	-	-	0.001
t	-	-	(3.14)	-	-	(1.49)
$Size_{i,t}$	-0.001***	-0.002***	-0.002***	-0.002***	-0.002**	-0.002**
t	(-3.48)	(-3.24)	(-2.98)	(-2.71)	(-2.45)	(-2.36)
$Age_{i,t}$	0.004***	0.004***	0.005***	0.006***	0.005***	0.006***
t	(4.83)	(4.45)	(4.85)	(3.89)	(3.54)	(3.98)
$ROA_{i,t}$	-0.02	-0.01	-0.04***	-0.005	0.003	-0.03
t	(-1.57)	(-0.84)	(-2.98)	(-0.39)	(0.18)	(-1.36)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
F test	4.35***	4.06***	4.43***	3.74***	4.03***	3.82***
R^2	0.1356	0.1169	0.1312	0.1151	0.0946	0.0944
R^2 adjusted	0.0912	0.0715	0.0866	0.0581	0.0362	0.0360
VIF mean	3.12	3.17	3.23	3.25	3.32	3.40
Obs.	308	308	308	232	232	232

Note: **(***)** significant at 1%; (**)significant at 5%; (*) significant 10%.
Standard errors were estimated with correction for White's heteroscedasticity, as the hypothesis of homoscedastic variances was rejected.
No statistically significant correlations were detected between the residuals of the equations and predictors (Gujarati & Porter, 2011); The application of the VIF test (Variance Inflation Factor) did not heteroscedasticity significant multicollinearity problems in the models, assuming values lower than 10 (Hair, Black, Babin, Anderson, & Tatham, 2009).
Legend: $GA_{i,t}$ – environmental expenses; $GA_{i,t+1}$ – environmental expenditures lagged in $t + 1$; $FF1_{i,t}$ – financial slack based on availabilities; $FF2_{i,t}$ – financial slack based on cash generation; $FF3_{i,t}$ – financial slack based on financial constraint; $Size_{i,t}$ – size; $Age_{i,t}$ – age; $ROA_{i,t}$ – return on assets; $SET_{i,t}$ – dummy for sector; $YEAR_{i,t}$ – dummy for year.

All the models are initially significant at 1%, indicating that at least one of the independent variables is statistically different from zero. However, the low explanatory power of these models stands out, varying between 9.4% and 13.5% (R^2) and between 3.6% and 9.1% (adjusted R^2).

The results in Table 5 indicate that the models that consider the financial slack based on availabilities indicate a relationship opposite to the expected. Note the occurrence of a negative relationship between (independent) and , and (dependent), at 1%. Therefore, an increase in the availabilities of these firms decreases their respective environmental expenditures.

In this context, the management in the group of companies that spend on environmental causes has chosen to keep cash instead of investing in environmental preservation, protection, control, and correction activities. This evidence is related to the low number of companies adhering to this strategy. Furthermore, among such firms, environmental "investment" was not very representative in relation to revenue (around 1% on average). It may show some conservatism among companies' managers concerning expenditures of this nature.

According to Fatemi et al. (2015), this finding is relevant to the debate that divides studies antagonizing the view of maximizing shareholder wealth with that of maximizing stakeholder wealth (Freeman, 1994; Friedman, 1970). There is evidence suggesting a non-linear relationship between environmental commitment and performance among companies. It means that the economic-financial performance of firms has increased only at so-called moderate levels of environmental investment (Fatemi et al., 2015).

Additionally, in the view of Kim and Bettis (2014), attention should be paid to the notion that cash can function as an important strategic asset, acting as a timely facilitator of adaptive advantages. Hence, companies may prefer to act by protecting and retaining these resources instead of directing them to projects not considered very economically interesting. The management of such firms may be waiting for the right moment to make these expenditures.

Fujii et al. (2013) and Pekovic et al. (2018) present results correlated to what was reported. In this sense, the apparent conservatism concerning environmental expenditures can be justified. According to Baber, Fairfield, and Haggard (1991), expenses of a discretionary nature are significantly lower when they may compromise the achievement of positive or increasing results.

Additionally, the decision to decrease environmental spending may be based on the idea that for many companies, these expenditures are considered investments with uncertain returns over the long term. As a result, there is much uncertainty about the ability to generate future economic benefits and, consequently, incremental cash flows for the firm due to environmental engagement (Baboukardos, 2018; Barnett & Salomon; 2012; Hassel et al., 2005).

Boso et al. (2017) suggest that the scarcity of resources is more significant in emerging countries, especially among smaller companies, due to these markets' fragile development conditions. Usually, these economies face weak legal protection, information asymmetry, high concentration of ownership, and political and economic instability (Gong & Wang, 2016; Iatridis, 2013; Middleton, 2015). This environment tends to alienate investors due to a greater perception of risk.

Therefore, the main side effects of these economic environments are financial prudence and the option to preserve capital, which would lead management to avoid optional operations not clearly related to the company's economic purpose, as is the case with environmental expenditures (Boso et al., 2017).

Considering availabilities, this result contradicts part of the literature on financial slack, according to which there is a greater propensity to invest in activities focused on the environment when financial constraints diminish (Daniel et al., 2004; Hong et al., 2012; Waddock & Graves, 1997).

Evidence is in line with the findings of Boso et al. (2017), Iatridis (2013), Julian and Ofori-Dankwa (2013), and Shahzad et al. (2016). However, the results reported by Lys et al. (2015), Surroca et al. (2010), and Zhang et al. (2018) diverge, while Pekovic et al. (2018) partially corroborate this study's evidence, and Qiu et al. (2016) reported inconclusive results on the relationship addressed here.

Nevertheless, Model 1c gathers evidence that contradicts the results regarding financial slack based on availabilities. There is a positive correlation between $FF3_{i,t}$ (independent) and $GA_{i,t}$ (dependent), as advocates of the theory suggest, that is, the greater the financial slack, the greater the spending on the environment (Daniel et al., 2004; Shahzad et al., 2016; Waddock & Graves, 1997).

This result reinforces the notion of heterogeneity of the financial slack construct since is a more comprehensive measure concerning the diagnosis of a company's financial situation. Attributes such as profit distribution policy and the opportunity to make investments are aspects not captured by $FF1_{i,t}$ or $FF2_{i,t}$.

The $FF3_{i,t}$ proxy is based on the *KZ index*, which assesses financial constraints, a feature that leads to its recurrent use in the literature (Baker *et al.*, 2003; Cheng *et al.*, 2014; Iatridis, 2013; Khatami *et al.*, 2015; Lamont *et al.*, 2001; Li *et al.*, 2006).

These results are in line with Lys et al. (2015), Surroca et al. (2010), and Zhang et al. (2018); however, they differ from Boso et al. (2017), Iatridis (2013), Julian and Ofori-Dankwa (2013) and Shahzad et al. (2016). In addition, Cheng et al. (2014) indicate significant differences in the financial constraints measured by the *KZ index* between firms with high and low socio-environmental performance.

However, two important aspects of the relationship between financial slack and environmental expenditures should be highlighted. First, the $FF3_{i,t}$ measure has greater power to explain the firm's financial situation because the proxy derives from several other components. On the other hand, $FF1_{i,t}$ is more persistent regarding the relationship with environmental expenditures (relation verified with *t* e *t+1*). Therefore, the hypothesis should be accepted, considering the financial slack based on the financial constraint.

Regarding the control proxies, a similar behavior was observed in most of the models tested. Even so, they must be discussed separately.

Company size has a statistically significant and negative correlation with environmental expenditures at the 1% level. Hence, among firms that spend on the environment, the larger ones have directed fewer resources to environmental expenditures, diverging from what the literature shows (Iatridis, 2013; Surroca et al., 2010; Zhang et al., 2018). Smaller companies may be using the environmental dimension as a way to enter the market.

Maturity has a positive relationship with environmental expenditures. Therefore, older companies would direct more resources to finance activities focused on the environment. Younger firms would be aware of the need to grow and face competition. Without the solidity of more mature companies, younger companies may prioritize their financial condition over environmental concerns. Boso et al. (2017) and Iatridis (2013) found no relationship between the variables, while Julian and Ofori-Dankwa (2013) showed a negative relationship.

Only one of the models presents a negative correlation between profitability and environmental expenditures. Firms with better economic performance are decreasing their spending on the environment, results that differ from those observed by Iatridis (2013) and Surroca et al. (2010).

Although Daniel et al. (2004) used profitability measures as a proxy for financial slack, this practice is critically analyzed. is based on the firm's profit or loss, and this book value is constituted by the accruals. Thus, this measure may anticipate financial flows instead of considering them current and better expresses the relationship between financial condition and discretionary spending.

Nevertheless, the mainstream literature on financial slack (e.g., Daniel et al., 2004; Waddock & Graves, 1997) supports the hypothesis that the greater the profitability, the greater the environmental commitment and expenditures of this nature. Lys et al. (2015) point out that, in reality, this relationship would result from management behavior deviation, which, by anticipating solid future economic performance, acts in favor of environmental issues.

Finally, we should briefly discuss the industry variable, which indicates the company's polluting potential derived from its primary activity. This variable has always been statistically significant at the 1% level, suggesting that potentially polluting businesses are more likely to make environmental expenditures.

Studies addressing Brazilian firms often associate the economic sector with the management's environmental commitment. Therefore, this argument is supported by two aspects: i) firms suffer significant pressure from society and other stakeholders; hence, there is some level of coercion based on legitimacy; and ii) the more significant the polluting potential, the greater the probability that a company endures legal sanctions or environmental disasters.

Brazilian studies (Machado et al., 2010; Vasconcelos & Pimentel, 2018; Viana & Crisóstomo, 2016) disagree regarding the role of the economic sector in this relationship. International studies such as Boso et al. (2017) did not identify a relationship between the sector and environmental expenditures. Cormier and Magnan (2007) align with this study's findings.

5. Conclusion

This study's objective, which was to examine whether environmental expenditures made by publicly traded Brazilian companies are influenced by financial slack, was fully achieved. The results explain some pertinent aspects.

Even though some argue in favor of the upward movement in raising awareness of the market and investors around environmental matters, few companies recorded environmental expenditures during the period addressed here, while the impact of such expenditures on revenues was small. Therefore, the results do not suggest the emergence of a group of firms intensely engaged with environmental issues in the emerging Brazilian context.

The antagonism between shareholder orientation and stakeholder orientation, which supports studies in this field, should be further discussed. A company's objective function is subject to these views, but both meet the assumption of existence and continuity. It equates to being primarily financially profitable. Therefore, the literature mistakenly suggests that the Stakeholder Theory proposes the priority of environmental commitment, despite the business value; however, this argument is not supported. It is because, when adhering to environmentally sustainable practices, the firm needs to direct resources that fail to finance other strategic areas.

Note that most of the observations in this study concerning environmental expenditures do not come from sectors considered to have a high polluting potential. Therefore, other motivations may explain this practice beyond the intrinsic pressures of an economic-sectorial nature.

One cannot rule out the interference of the institutional environment in the expenditure scenario at the company level and from the investment perspective. The characteristics of the Brazilian market, the conditions of scarce resources, political interference, economic instability, and a search for accelerated growth probably discourage these expenditures.

Considering these aspects, it is more challenging to identify the gains derived from environmental responsibility. Amidst so many uncertainties, one chooses not to "invest" in the environment, or if so, prudence prevails in financing expenditures.

Firms can favor a superior comprehensive financial condition instead of individual aspects when assessing expenditures on the environment. It can be noticed by the inverted signs of financial slack measures based specifically on cash and financial constraint.

Thus, a higher level of financial constraint may lead to environmental expenditures, but the same cannot be said for cash and cash equivalents. In this sense, the comprehensive measure for financial slack may be more accurate regarding the decision to undertake environmental expenditures. However, one cannot ignore that the cash-based measure is more persistent.

The hypothesis proposed here cannot be rejected, provided that multiple indicators are considered in the assessment of financial slack to allow a clearer picture of the company's condition concerning its ability to finance these expenditures.

It may not be prudent to accumulate cash in environments of uncertainty and as a measure of protection against actions to expropriate principals. Some managers would dare to use the resources for their benefit, such as, for example, managing results or through ineffective actions to preserve, control, or correct environmental impacts.

Another debatable aspect concerns the comparative size/maturity of companies. The second aspect seems to be more favorable than the first concerning environmental expenditures. Older and more experienced companies can be more certain about their condition, financial capacity, and strategic solidity to promote actions involving environmental issues in the short, medium, or long term.

Size, in turn, does not suggest a greater or better operational structure favorable to these expenses. As a result, smaller firms would spend proportionally more on the environment; this is what research might suggest.

As for profitability, a relationship different from the expected was found, and it can be analyzed the same way as what was discussed regarding the first proxy of financial slack. Cash and cash equivalents reflect cash flows and the investment policy and maintenance of available cash, which allows direct access to managers. Profitability, in turn, is influenced by the accruals generated on an accrual basis. This proxy's coefficient proved superior to those obtained with the other financial slack proxies.

This study has limitations that must be considered when comparing results with other studies. These limitations represent opportunities future studies might address.

Intersectoral studies are of great value in analyzing the characteristics that moderate the variables of interest. Although the industry emerged as a control for fixed effects in this study, future research may explore economic activities individually. The proxies related to the variable financial slack can be expanded or improved, especially with assessment considering several indicators.

Comparing countries is a logical aspiration in this type of study. It was more important to investigate the nature of expenditures (e.g., expenditure, investments, or costs) and their purpose (how and where they are applied) though. Hence, this study's evidence can gain greater evidence in the debate between shareholder orientation and stakeholder orientation views.

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Quantitative Empirical Research in Management Accounting: A Proposed Typology and Implications for Internal versus External Validity

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Abstract

Purpose: The purpose of this study is twofold. First, we propose a typology of quantitative empirical research in management accounting based on two design features: presence of control group and sample representativeness. Second, we discuss implications of the methods for trade-offs between internal and external validity.

Method: Based on previous methodological studies we develop a typology with eight quantitative empirical methods.

Results: Based on the two design features, we propose eight quantitative empirical methods for management accounting studies: (1) laboratory experiment, (2) crowdsourcing experiment, (3) field experiment, (4) natural experiment, (5) single entity survey, (6) proprietary archival study, (7) large-scale survey and (8) pre-structured archival study. In addition, we critically compare the trade-offs and discuss the implications of these methods for internal and external validity.

Contributions: The contribution is twofold. First, the proposed typology can help junior management accounting researchers increase the familiarity with the available empirical methods, some of which are still incipient in Brazil. Second, this study states that the choice of an empirical method typically implies benefits in terms of a validity type (e.g. internal validity) at the expense of other validity type (e.g., external validity). Claims of causality and results generalizability depend on which validity type is prioritized and remedies adopted to increase the overall validity of a study's results.

Keywords: Quantitative empirical methods; Management accounting; Control group; Sample representativeness; Validity types.

1. Introduction

It is not uncommon for management accounting (MA) researchers in early stages of their careers, and eventually for more experienced researchers, to make claims that cannot be supported by the empirical method used to design the study. For instance, researchers may be tempted to make causal claims in studies that do not meet the necessary conditions for that, such as there is no plausible alternative explanations for the effect other than the cause (Shadish, Cook, & Campbell, 2002). Similarly, researchers may be tempted to make claims of generalizability of results, even though random selection as a major way to provide evidence for generalization is rarely the case (Trochim, Donnelly, & Arora, 2016).

We argue that these flawed claims are made because MA researchers, particularly junior researchers in Brazil, are not familiar with the available empirical methods and, consenquently, with the implications of the different methods in terms of the validity framework. In fact, prior studies have consistently shown that the range of empirical methods used by MA researchers in Brazil is rather narrow, with a prevalence of large-scale surveys (e.g., Aguiar, 2018; Frezatti, Aguiar, Wanderley, & Malagueno, 2015). As long as junior MA researchers in Brazil are not familiar with the available methods, they may not be equally familiar with the relative advantages and disadvantages of each method in terms of research validity.

Moreover, although junior MA researchers can access available empirical methods through methodological books (i.e., Smith, 2022; Saunders, Lewis, & Thornhill, 2019), these books provide only a limited view for at least two reasons. First, research methodology books broadly discuss each available empirical method, such as experiment, archival and survey, not considering that each method can be further dismembered in more specific research designs, with associated validity benefits and threats. For instance, archival studies can use either pre-structured or proprietary data (Moers, 2006). Second, these books usually focus on the protocols to be followed by each broad research method, lacking a more specific and critical discussion about the implications for the validity framework.

The lack of knowledge about the available empirical methods and their implications for research validity may have fundamental consequences for the advancement of a research field. On the one hand, the lack of familiarity with the diverse options of available methods can actually narrow down the scope of research questions that MA researchers investigate as well as overlook the complementarities of using different empirical methods to address the same research question (Bloomfield, Nelson, & Soltes, 2016). On the other hand, the lack of knowledge about the implications of the available methods for the validity framework can lead MA researchers to make unsupported claims, particularly, in terms of causal relationships and generalizability of results.

Given the importance to increase the breadth of empirical methods used by junior MA researchers in Brazil, the purpose of this study is twofold. First, we propose a typology of quantitative empirical research in MA. Quantitative research is prevalent in accounting research (Hesford, Lee, Van der Stede, & Young, 2006; Nascimento, Junqueira, & Martins, 2010; Aguiar, 2018). Moreover, validity criteria for quantitative studies differ in type and importance from qualitative studies. We focus on MA because a typology has already been proposed to help accounting researchers to select appropriate methods based on the data gathering tasks involved (Bloomfield et al., 2016). While useful in general, Bloomfield's et al. (2016) typology does not consider the singularities that MA researchers face in the process of selecting the particular empirical method to be used for the research project. For instance, when selecting a survey, MA researchers have to further decide the level of analysis and representativeness of the sample (Van der Stede, Young, & Chen, 2006). The proposed typology is based on two design features: presence of control group and sample representativeness. Building on these criteria, we discuss about eight different methods: (1) laboratory experiment, (2) crowdsourcing experiment, (3) field experiment, (4) natural experiment, (5) single entity survey (6) proprietary archival study, (7) large-scale survey and (8) pre-structured archival study.

Second, we discuss the main implications of the proposed typology for research design in terms of the validity framework. Validity refers to the "approximate truth of an inference" (Shadish et al., 2002, p. 34). The validity of research findings are inevitably affected by the research design (Dyckman & Zeff, 2014). Each empirical method thus affects differently the types of validity and researchers have to make trade-offs between the validity types. While four validity types exist, we focus on internal and external validity for two reasons. First, internal validity is key for causal claims, while external validity is central for claims of generalizability (Shadish et al., 2002). Second, there generally are trade-offs between internal and external validity that each empirical method has to face (Luft & Shields, 2014; Roe & Just, 2009).

The contribution of this study is twofold. First, we propose a typology of quantitative research in MA based on two key design features that can help expand the toolkit available to junior scholars in the design of their studies. For instance, we highlight that the choice of a survey requires from MA researchers to make a subsequent choice related to the unit of observation between large-scale or single-entity surveys. The empirical methods included in the proposed typology can help junior MA researchers increase the familiarity with the available alternatives, some of which are still incipient in Brazil, such as experimental designs (Aguiar, 2017; Nascimento et al., 2010). Second, the discussion about the implications of the proposed typology provides insights on the trade-offs among the validity types MA researchers have to pay attention when selecting a particular empirical method. For instance, the choice of an empirical method including a control group may favour internal validity while, at the same time, pose challenges in terms of external validity. In other words, the choice of a particular empirical method implies a simultaneous choice of the validity types that is favoured in the study versus creates challenges for the researcher.

2. Validity in MA Research and Proposed Typology

2.1 Internal Validity and Causal Claims: Control Group

There are three main types of cumulative research studies (Trochim et al., 2016): i) descriptive studies, which focus on documenting what are the key characteristics of a population or phenomenon; ii) relational studies, which focus on examining the relationship between two or more variables; and iii) causal studies, which focus on determining whether one or more independent variables causes one or more dependent variables. The willingness to stablish causal relationships and make causal claims is one of the main goals of quantitative studies in MA (Van der Stede, 2014). In causal studies, the key concern is to increase internal validity, that is, "The validity of inferences about whether observed covariation between A (the presumed treatment) and B (the presumed outcome) reflects a causal relationship from A to B as those variables were manipulated or measured" (Shadish et al., 2002, p. 38).

For a research project to be able to make causal claims, three conditions have to be met: the cause precede the effect, the cause is related to the effect, and no plausible alternative explanations for the effect are found other than the cause (Shadish et al., 2002; Luft & Shields, 2014). Researchers can use theoretical arguments and/or lagged variables to claim that the cause precede the effect. Researchers can also use different statistical tools to show that the cause is related to the effect. The main challenge with causal claims is though to guarantee the absence of plausible alternative explanations for the presumed causal relationship.

The most effective way to eliminate alternative explanations is by knowing what would have been the effect if the cause had not been present, that is, by creating a counterfactual (Floyd & List, 2016). The creation of a counterfactual is a design choice that involves the presence of a control (or baseline) group. In other words, a **control group** creates a useful counterfactual inference, essential for research studies interested in establishing causal relationships (Lonati, Quiroga, Zehnder, & Antonakis, 2018).

The presence of a control group is the hallmark of experimental studies (Shadish, Cook, & Campbell, 2002; Trochim, Donnelly, & Arora, 2016), so that this design choice allows the separation of experimental from non-experimental studies. As a counterfactual, a control group represents a group of respondents/ participants who are comparable to the treatment (experimental) group in every way possible, with the main difference being that the control group is not exposed to the treatment/manipulation (Oehlert, 2003). For instance, in a study examining the effect of rewards on employee motivation, the treatment (control) group would include participants who (do not) receive a reward. For such research design, the researcher would compare employee motivation between the treatment group and the control group used as a counterfactual and examine whether or not the fact that a reward is provided would affect employee motivation.

Overall, the main benefit of including a control group is that researchers can mitigate the likelihood of alternative explanations for a causal relationship and, thus, improve internal validity and more confidently make causal claims (Floyd & List, 2016).

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2.2 External Validity and Claims of Generalizability: Sample Representativeness

Researchers can gather primary and/or secondary data to address the research question. In either way, researchers have to stablish the process of selecting units from a population of interest, being them individuals, groups, subunits or organizations; that is, researchers have to stablish the sampling process that will allow them to generalize results from the sample to the population from which the units are selected (Speklé & Widener, 2018). Generalizability claims are desirable and common in accounting studies (Dyckman & Zeff, 2014). For that, researchers have to enhance external validity, that is, "the extent to which a causal relationship holds over variations in persons, settings, treatments, and outcomes" (Shadish et al., 2002, p. 83).

There are two main approaches to select a sample: probabilistic and non-probabilistic. The main difference between the two approaches is that probabilistic sampling involves random sampling, in which every unit in the population has the same chance of getting selected (Dyckman & Zeff, 2014). In order to make claims of generalizability of results, the best approach is the use of probability sampling that, however, is rarely feasible (Speklé & Widener, 2018). Alternatively, researchers can use an approach called proximal similarity model that allows generalizations from the observed sample to other samples based on the degree to which the other samples are similar to the observed sample (Trochim et al., 2016).

Regardless of the sampling approach, the challenge is to obtain **representative samples** so that generalization is possible. Through representative samples, researchers can provide evidence of external validity and then make claims of generalizability of results. Given the challenge with the use of random sampling, MA researchers typically obtain representative samples through the use of heterogeneity sampling, in which units are chosen purposively to reflect diversity on pre-defined important dimensions (Shadish et al., 2002). For instance, in a study examining the effect of reward types on executive myopic behavior, researchers can use pre-structured data from a variety of organizations, that is data that are gathered and stored prior to the beginning of the research (Das, Jain, & Mishra, 2016; Moers, 2006), and are publicly available through platforms such Economatica and Compustat. As another example, a study examining the effects of control systems in family firms on non-family members behaviour could collect representative samples through questionnaires sent to a large number of family firms. Representative samples can also be obtained through the use of proprietary dataset, that is, dataset is confidential and can be accessed only if the data proprietor/owner grants access (Moers, 2006). Examples of proprietary data are third-party surveys (e.g., consulting firms) and firm internal data (Das et al., 2016; Moers, 2006).

Overall, the key benefit of representative samples is improved external validity, which allows for more supported claims of generalizability of results (Trochim et al., 2016).

2.3 Proposed Typology

Building on the two criteria—control group and sample representativeness—we propose a typology with eight quantitative empirical method alternatives that MA researchers can use when addressing their research questions (Figure 1). The proposed typology involves two dimensions based on the design choices associated with each criterion.

In the **first dimension**, researchers decide whether the research design includes a control group. If included (Figure 1, left side), the choice leads to the use of experimental empirical methods; conversely, non-experimental empirical methods are chosen (Figure 1, right side). In the **second dimension**, researchers decide whether they will use samples that are more or less representative. For both experimental and non-experimental studies, the researcher can select an empirical method that either has lower or higher sample representativeness. We next discuss about each alternative empirical method.
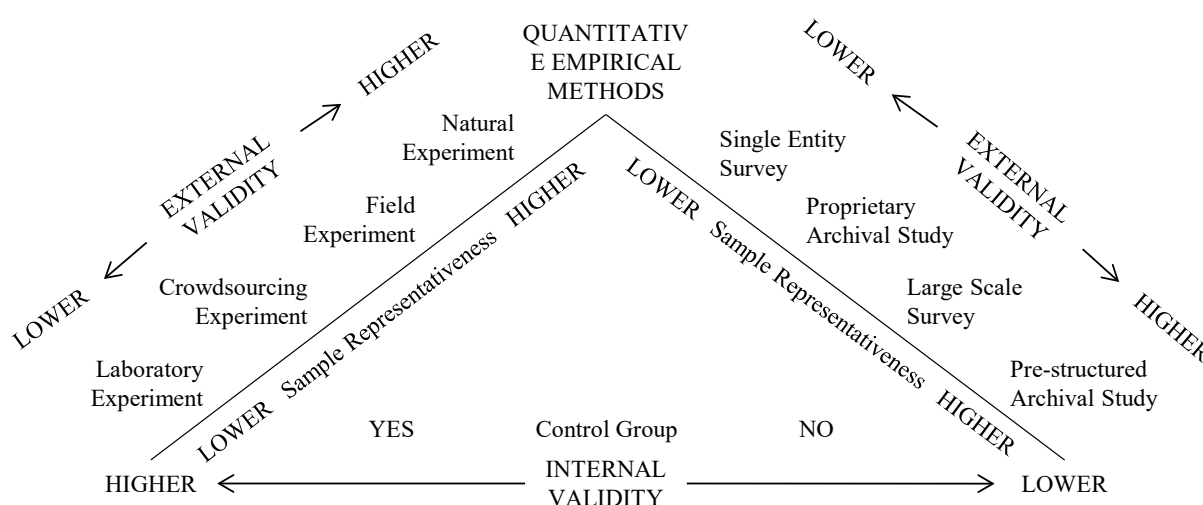

Figure 1. Proposed typology of quantitative research in MA

3. Alternative Quantitative Empirical Methods

3.1 Laboratory experiment (Lab experiment)

Lab experiments have as main characteristics the presence of control group, random assignment, and the fact that the treatment (e.g., independent variable) is manipulated (Bloomfield et al., 2016; Sprinkle & Williamson, 2006; Swieringa & Weick, 1982). Participants in lab experiments typically have similar characteristics—same undergraduate course, approximately same age, and similar background (Shadish et al., 2002; Sprinkle & Williamson, 2006). Lab experiments can be run in labs or, for social scientists, in rooms where the experimenter can ensure physical control over participants, such as rooms with individual spaces that prevent participants from looking to other participants or to use technological gadgets during the experiment.

The fact that lab experiments use control group, random assignment, and manipulated variables improves internal validity for such studies. As already mentioned, control groups create the counterfactual to eliminate alternative explanations (Oehlert, 2003). Random assignment means that two or more groups of units are created that are probabilistically similar to each other on the average, so that any outcome differences that are observed between the experimental and the control groups are likely due to treatment rather than pre-existing differences (Shadish et al., 2002). Manipulated variables enhances that the cause purposefully precedes the effect. By using random assignment and manipulated variables, the researcher can control the research setting and also reduce alternative explanations by isolating the effects of confounding variables (Sprinkle & Williamson, 2006).

The controlled environment of lab experiments, however, contributes to lower external validity of such studies. For commonly recruiting homogeneous participants (e.g., undergraduate students) through non-probabilistic, purposeful sampling (Carpenter, Harrison, & List, 2005), the sample representativeness in lab experiments tend to be quite low. In fact, it is desirable that participants for lab experiments are a *tabula rasa* so that the only influence they experience is the treatment, what makes students well suited, particularly if the study requires specific knowledge (e.g., analysing financial statements) but do not require specific experience (Mortensen, Fisher, & Wines, 2012; Trottier & Gordon, 2018). Accordingly, lab experiments are highly criticized for their artificiality (Harrison, 2005; Carpenter et al., 2005).

An example of a lab experiment that focuses on managers' decision-making process is Haesebrouck's (2021) study on the effects of information acquisition effort and the induced psychological ownership on managers' reporting. As part of their job, managers can either exert great effort to acquire, synthesize and analyse data from several sources or easily acquire this information if the company possess good information sharing systems. To test the predictions, the author used an experimental design, where information acquisition (endowed vs. earned) and saliency of honesty in the reporting context (less vs. more salient honesty) are manipulated. The paper ensures internal validity by following several experimental procedures (i.e., randomization, demographics, and direct observation of participants). The author states that the experiment focuses on theory testing and results might not be generalized to other settings.

Overall, on the one hand, due to the presence of control group, random assignment, and manipulated variables, lab experiments are considered the empirical method with the highest internal validity (Trochim et al., 2016) and with the greatest chance to stablish causal claims. On the other hand, the use of less representative samples and artificial environments makes lab experiments the empirical method with the lowest external validity (Asay, Guggenmos, Kadous, Koonce, & Libby, 2021) and the least chance to make generalizability claims.

3.2 Crowdsourcing experiment (or online experiment)

Crowdsourcing experiments are relatively similar to lab experiments due to the fact that they also include control group, random assignment, and manipulated variable. However, the two experimental designs differ as for location and participants. Crowdsourcing experiments use online platforms (e.g., MTurk, Prolific, and CrowdFlower) rather than labs or rooms. The use of such platforms allows researchers to recruit participants from larger pools beyond students from limited geographical locations (Peer, Brandimarte, Samat, & Acquisti, 2017).

As crowdsourcing experiments use control group, random assignment, and manipulated variables, internal validity for such studies is enhanced. However, the use of online platforms creates internal validity threats by decreasing researchers' control over the experiment. The researchers have less control over noises and biases, such as lack of attention or effort, or even unqualified participants (Bentley, 2021). Researchers can also face fraudulent behaviour from participants, affecting data integrity and reliability (Aguinis & Ramani, 2021).

The use of a more heterogeneous group of participants, however, contribute to increase the external validity for crowdsourcing relative to lab experiments due to more representative samples. Online platforms allow researchers to filter several demographic characteristics that can help narrow down participants on the one hand; at the other hand, researchers can examine their theory recruiting participants with different ages, cultures, and backgrounds. Moreover, despite the increasing use of online platforms, there is still great criticism over the reliability of such data compared to other types of experimental data (Chmielewski & Kucker, 2020).

Example of crowdsourcing experiment is Murphy, Wynes, Hahn, and Devine's (2019) study on the internal and external motivation to honest reporting. The authors use MTurk participants in an experiment where they have both opportunity and incentive to misreport in order to test different motivations behind honesty. Since the goal is to test motivation behind decisions, three manipulations are used: baseline (control group) vs. reward vs. punishment. The authors explain that MTurk participants are suitable for the experiments given the nature of tasks (i.e., not specialized). Consistent with crowdsourcing experiments, the study combines internal and external validity. The authors ensure internal validity by applying different manipulations and ensure external validity by using participants with different characteristics.

Overall, on the one hand, researchers give up part of the laboratory experiment's ability to monitor participants in-person, which renders the crowdsourcing experiment lower internal validity compared to lab experiments. On the other hand, the use of online platforms that allow researchers reach a larger and more diversified pool of participants improve the external validity of crowdsourcing experiments relative to lab experiments.

3.3 Field Experiment

Field experiments are field studies that use the experimental method in which either treatments or effects are observed for longer periods of time (Lourenço, 2019; Bloomfield et al., 2016). Field experiments are similar to other experiments, including control group, random assignment, and manipulated variable. The main difference is that they are conducted in the field (i.e., organizations) and participants are professionals working in naturally occurring environments, which are generally not aware of being taken part of the experiment (Lourenço, 2019; Floyd & List, 2016). Moreover, field experiments allow researchers to use proprietary data and measured variables to achieve the study's goal (Asay et al., 2021).

Due to the fact that field experiments also use control group, random assignment, and manipulated variables, internal validity for such studies in enhanced. Yet, field experiments face higher internal validity threats due to the lower level of control as researchers cannot create an artificial, isolated environment in which participants will make judgments and/or decisions and variables will be manipulated as can be done in lab experiments (Lourenço, 2019).

The use of naturally occurring environments that are not artificially created by the researcher, in which participants do not know that they are part of the experiment and are performing their daily tasks, contribute to an increase of external validity in field experiments relative to lab and crowdsourcing experiments. Although these features can increase external validity in terms of realism, field experiments are also bounded to less representative samples (e.g., business unit, single company).

Example of field experiment is Cronin, Erkens, Schloetzer, and Tinsley's (2021) study on the effects of controlling failure perceptions on performance. The authors manipulate the video-based message that sales workers see during their weekly meeting in one of 20 Brazilian distributorships of a multinational direct sales organization. In the treatment condition, sales workers see a video message from the regional head encouraging workers to look at failure as a "natural part of history". While, in the control condition, sales workers see the same regional head summarizing the organization's history. The authors conducted the experiment during a four-week period, with control and treatment groups, and with proprietary data (e.g., weekly sales commission). Moreover, even though field experiments have more generalizable results compared to lab and crowdsourcing experiments, the authors disclosed the limitations of using experimental methods and confounding factors associated with field studies.

Overall, field experiments provide a potent combination: benefits of internal validity, consistent with the experimental method, and real world data that comes from the field (Bloomfield et al., 2016; Lourenço, 2019). This combination offers a great mix between "control and realism usually not achieved in the laboratory or with uncontrolled data" (Floyd & List, 2016, p. 438). Field experiments then offer lower level of internal validity due to reduced control associated with less artificial and isolated environments, but these costs come at the benefits of greater generalizability to naturally occurring settings.

3.4 Natural Experiment

Natural experiments are naturally-occurring events (e.g., exogenous shocks) that are not manipulated but can establish a "contrast between a treatment and a comparison condition" (Shadish et al., 2002, p. 17). Events that do not happen through natural intervention (e.g., flood, hurricane) can also be treated as natural experiments (e.g., law adoption) (Mcvay, 2011). Thus, natural experiments are feasible when events occur due to human or natural interventions, and researchers can compare ex-ante to ex-post outcomes. While including a control group, natural experiments do not include random assignment and manipulated variables due to the naturally-occurring events. Because of that, natural experiments are regarded as quasi-experiments (Lourenço, 2019; Aguinis & Bradley, 2014). Moreover, natural experiments can benefit from large available pre-structured or proprietary data.

While natural experiments also use control groups as counterfactuals to increase internal validity, this research method tends to face more internal validity threats. The main reason is that control and treatment groups are not designed by researchers, but set exogenously. Then, participants are not randomly assigned to experimental conditions and, consequently, researchers cannot assume that experimental groups are equivalent (Trochim et al., 2016). As such, researchers that run natural experiments have to find alternative methods to minimize internal validity threats by using sophisticated statistics, such as Difference-in-Difference, Regression Discontinuity Design, and Synthetic controls (Lonati et al., 2018).

The extent to which results from natural experiments can be generalized depends on the unit of observation. When the unit of observation is at the organizational level (most common case), that is, when the exogenous event has affected a large sample of organizations, the ability to obtain representative samples and generalize results is higher. Yet, when the unit of observation is at the subunit or individual level, the challenge with external validity is higher, since researchers will have a hard time in convincing that the studied organization is somehow similar to other organizations.

Example of natural experiment in MA is Flammer and Kacperczyk's (2016) study about effects of stakeholder orientation on innovation in company's business decisions. The authors explore the enactment of state-level constituency statutes, particularly the statutory change of the responsibility from shareholders to stakeholders. From 1980 to 2006, 34 US states have adopted constituency statutes that focus on stakeholder value creation. The authors use data about patent creation from the National Bureau of Economic Research (NBER) Patent Data Project from 1976 to 2006 to assess the dependent variable, innovative productivity, measured as the number of patents and citations divided by the number of company's employees. To deal with internal validity threats, the authors collected several control variables that could act as confounding factors. This study is consistent with natural experiments providing higher external validity due to the use of large available pre-structured dataset.

Overall, similar to field experiments, natural experiments combine the benefits of internal validity by including control group, and external validity by examining naturally-occurring events (Bloomfield et al., 2016; Lourenço, 2019). With that, this empirical method provides intermediate degrees of internal and external validity (Roe & Just, 2009) that allow balanced claims of causal relationship as well as generalizability of results.

3.5 Single Entity Survey

Single entity surveys are developed through the use of questionnaires and submitted to respondents from one organizational setting. Studies that employ this method do not include a control group, random assignment, or manipulated variables. For single entity surveys, qualitative information from the organizational context (i.e., interviews) has a central role in shaping and "calibrating" research instruments from the survey. Moreover, single entity surveys are commonly administered as a cross-section and the survey instrument can be designed with questions to capture facts rather than perceptions and opinions. This empirical method has better chances of using longitudinal designs as well as better limit target respondents and use random samples. Also, the support of the firm can influence respondents' motivation and minimize potential response and non-response biases. Respondents in single entity surveys typically include employees (individual level), groups (team level), subunit managers (subunit level).

The fact that single entity surveys do not include control group, random assignment, and manipulated variables pose internal validity threats, considering the non-temporal separation of the cause and effect as well as issues related to measurement and survey design such as common method bias (Speklé & Widener, 2018). In particular, self-selection is a relevant internal validity threat, whether in terms of the firm that accepts to participate or the respondents that accept to take part in the survey. The access to the field, however, can reduce the internal validity threats in different ways. For instance, the understanding of the setting before survey implementation allows researchers to obtain more qualified and less biased responses by identifying knowledgeable potential respondents and engaging them to respond the survey. Also, the use of qualitative data can help calibrate the research instrument and allow appropriate choices of ideal employee-titles for the study. If the use of longitudinal designs is feasible, internal validity is substantially improved.

Single entity surveys face challenges in making inferences to other organizations since the research model is context dependent. Although researchers in single entity surveys usually obtain larger response rates than in large-scale surveys (Hiebl & Richter, 2018) and are more capable of addressing issues related to nonresponse bias, the findings are not generalizable to other samples due to the particularities of the context. This means that findings are only empirically applicable to organizations with very similar characteristics and phenomena. Thus, considering these limitations, when discussing external validity for single entity surveys researchers are usually referring to the generalization of the sample to the population of individuals within that organizational setting in certain period of time (e.g., current middle-managers or assembly workers) or the generalization to the theoretical level.

Example of single entity survey in MA is Mucci, Frezatti and Bido (2021), which investigates the association between four enabling design characteristics of budgets and managers usefulness perceptions in an organization that operates in the electric utilities industry. The single entity survey was developed with a sample of 75 middle managers from different business areas (i.e., finance, operations, and marketing) and was operationalized with the support of the firm budgeting manager. The researchers obtained a high response rate of 42% and followed several procedures to mitigate internal validity threats (i.e., strict theoretical model, control variables, and common-method bias).

Overall, single entity surveys face several internal validity threats, but are able to deal with part of them by strictly defining the theoretical and empirical model in light of the context being investigated (Luft & Shields, 2002) as well as partially controlling for confounding effects that emerge from the context. In general, by not having control group single entity surveys present lower internal validity than the experimental methods. Similarly, the limited design in the organizational setting poses external validity threats to single entity surveys. In fact, this empirical method may be the one with the lowest external validity among the non-experimental methods. Then, while single entity surveys have a balanced degree of internal and external validity, the overall degree of validity is lower than the one from field and natural experiments that also have a more balanced degree of validity.

3.6 Proprietary Archival Study

Proprietary archival studies use confidential archival data from third-party surveys or firm internal data that can be accessed only if the data proprietor/owner grants access (Moers, 2006). As a non-experimental method, proprietary archival studies do not include control group, random assignment, and manipulated variables. If the dataset is obtained from third-parties, this empirical method can include a large and heterogeneous set of observations that can render greater sample representativeness, which brings proprietary archival studies closer to pre-structured archival study. In turn, if firm internal data is used, this empirical method is closer to single entity surveys due to the potential use of context-specific information that can help researchers in the choice of appropriate proxies for the relevant variables.

As a non-experimental method, proprietary archival studies face several internal validity threats mainly associated with self-selection and endogeneity concerns (Lourenço, 2019). Moreover, the lack of control group makes more challenging ruling out alternative explanations to results. Proprietary archival studies then typically follow econometric procedures to deal with internal validity threats, such as using instrumental variables. These threats are particularly serious when third-party surveys are used. When using firm internal data, researchers can gather additional unstructured data and structure it to create measures that are suitable for addressing relevant research questions to a particular study, which gives more flexibility in the search for suitable proxies for variables of interest. Moreover, proprietary data can be combined with field interviews to help identify suitable proxies for relevant variables.

Proprietary archival studies involve large and comprehensive samples (Moers, 2006). Yet, their ability to make inferences from observed samples to samples located in other places and at other time may be more challenging, particularly relative to firm internal data. When using firm internal data, sample representativeness is a key challenge and thus the ability to generalize results from observed samples to other samples. The reason is that observations at the subunit or individual (e.g., employee) level of analysis may be unique to the sampled firm characteristics, making difficulty to generalize results to firms with different characteristics. Because of that, similar to laboratory experiments, proprietary archival studies can better argue in favour of generalization to the theory being tested.

Ikäheimo, Kallunki, University, and Schiehll (2018) is a proprietary archival study with no control group and using firm internal data. Ikäheimo et al. (2018) examine the relationship between performance-based incentives for white-collar employees and firm future profitability and if this relationship depends on task complexity. They use a large proprietary compensation dataset from a survey administrated by the Confederation of Finnish Industries. The dataset includes over 564,000 individual employee-year and 7,820 firm-year observations over the years 2002–2011. The authors conduct robustness checks to deal with endogeneity issues and thus increase internal validity. Given the large dataset, there is high ability to generalize results to other organizations that use incentive schemes and plan to change them, or do not currently have incentive schemes but plan to adopt them.

Overall, on the one hand, when proprietary archival studies include third-party surveys, internal validity threats are higher due to self-selection bias and endogeneity problems, but the sample representativeness and thus external validity is higher. As we will see, these features bring this empirical method closer to pre-structured archival studies. On the other hand, when internal firm data is used, internal validity concerns are remedied by the use of context-specific information, but external validity is harmed as the dataset is specific for a single organization. In this case, these features bring this empirical method closer to single entity surveys.

3.7 Large-Scale survey

Large-scale surveys are commonly used in quantitative MA research (Van der Stede et al., 2006; Speklé & Widener, 2018). This method collects data through the use of questionnaires that are submitted to a broad set of potential respondents; yet, obtaining a large number of responses is usually a challenge for MA researchers. Sample representativeness depends on the use of random selection and the response rate; however, most studies in the MA field use convenience samples. Similar to other non-experimental methods, large-scale surveys do not include control group, random assignment, and manipulated variables. Large-scale surveys are usually designed cross-sectionally and relevant variables are elicited in the research instrument (Bloomfield et al., 2016). Even when involving longitudinal data, large-scale surveys can suffer from the lack of responses since respondents might not be available to participate in second or third survey waves. Finally, large-scale surveys commonly consist of data that express facts, opinions, or perceptions considering different levels of analysis, typically at the organizational or business unit levels.

As a non-experimental method, large-scale surveys face several internal validity threats mostly associated with self-selection bias and endogeneity problems. There is no counterfactual or time difference between cause and effect. When longitudinal data is collected, it is more feasible to argue in favour of time difference between cause and effect, but then mortality is a relevant threat. To deal with internal validity threats, researchers conducting large-scale surveys can adopt several remedies, such as, defining theoretical population, target population and target respondents, using different types of responses (facts, opinions, etc.) and carefully designing the research instrument. Yet, while effective, these remedies cannot completely overcome internal validity threats.

Large-scale surveys benefit from the use of large samples and are thus able to provide evidence that can be generalized to other samples. However, researchers are usually aware that potential for generalizing results depends on sample representativeness, nonresponse bias, and response rates (Hiebl & Richter, 2018; Spekle & Widener, 2018). Also, the ability of large-scale surveys to generalize results depends on whether nonprobability or probability sampling is used, with the former being the most common strategy. Hence, the toolkit available for increasing the arguments for external validity are different to those applied for other methods.

Example of large-scale survey in MA is Bedford, Spekle, and Widener (2022), which conduct a large-scale survey with Business Unit (BU) managers from the Netherlands, with a final sample of 83 respondents. They study how firms change budget tightness in response to global crisis and the implications of budget tightness for employee stress and emotional exhaustion, also considering an enabling budget design as moderator for this relationship. Bedford et al. (2022) run a cross-sectional survey design using online questionnaires, addressed to a population of 172 BU managers. Although sample size is relatively small, they obtain a high response rate of 48.3 percent. The authors follow several procedures to mitigate internal and external validity threats. They address nonresponse bias and common method bias, in addition to use validated instruments and control variables.

Overall, this empirical method faces higher internal validity threats than all previous empirical methods, whether experimental or non-experimental. Compared to single-entity survey and proprietary archival studies, large-scale surveys do not consider contextual data (i.e., organizational particularities), rendering problems related to definition of proper respondents, suitability of research instruments, and biases associated with individual responses (e.g., hallo effect, social desirability, lack of knowledge). On the other hand, compared with the other non-experimental methods discussed so far, results of large-scale surveys have a higher level of external validity due to the participation of a large set of respondents.

3.8 Pre-Structured Archival Study

Pre-structured archival studies use archival data that is recorded and structured by third-parties, whose primary purpose is not academic research (Bloomfield et al., 2016; Moers, 2006). Pre-structured archival studies do not include control group, random sampling, or manipulated variables. Relevant variables are operationalized through the use of proxies defined from the available dataset. The dataset typically includes observations for several respondents, mostly at the organizational level. Pre-structured archival studies are the primary research method used in the accounting literature (Bloomfield et al., 2016). For MA studies, the lack of available public data makes more challenging the use of pre-structured archival studies relative to alternative research methods (Hesford et al., 2006; Moers, 2006; Aguiar, 2018).

As a non-experimental method, pre-structured archival studies have difficulty in ruling out alternative explanations as observed associations between variables of interest can be attributed to reverse causality, omitted correlated variables, or miss-specified functional form (Gassen, 2014). Similar to proprietary archival studies, pre-structured archival studies face several internal validity threats associated with selection bias and endogeneity that researchers try to solve by using econometric tools (e.g., instrumental variables) (Lourenço, 2019).

Given that pre-structured archival studies use large samples (Das et al., 2016; Moers, 2006), their ability to make inferences from observed samples to samples located in other places and at other time is relatively high. The unit of observation tends to be highly representative, so that results may be generalizable to the population of interest. However, selection bias may pose challenges for sample representativeness in pre-structured archival studies, in particular, self-selection bias since the disclosure of MA information is not random (Moers, 2006).

Laviers, Sandvik, and Xu, (2021) is an example of pre-structured archival study. It does not include control group and uses several large available datasets. Laviers et al. (2021) examine investor reactions to CEO pay ratio voluntary disclosures. They collect proxy statements from firms listed in the Standard & Poor's 1500 index with mandated CEO pay ratio disclosure and classify firms as having low, middle, or high pay ratio. The authors combine CEO pay ratio information with information collected from database platforms, such as stock returns from CRSP, financial information from Compustat, and executive compensation from Execucomp. Given the lack of control group, Laviers et al. (2021) conduct several additional analysis and robustness tests using different empirical specifications to increase internal validity. Regarding generalizability of results, the authors deal with self-selection by using an estimation procedure by which they include the inverse Mills ratio (Heckman, 1979).

Overall, on the one hand, due to the lack of control group, random assignment, and manipulated variables, pre-structured archival studies face several internal validity threats that are dealt with through the use of econometric tools. In fact, we suggest that pre-structured archival studies are the empirical method with the lowest internal validity. On the other hand, due to the use of large dataset, including observations from organizations at different industries, ages, sizes, and so on, pre-structured archival studies tend to include highly representative samples, increasing the ability of this empirical method to make generalizable claims.

3.9 Summary

We summarize in this section the proposed typology of quantitative empirical methods, emphasizing the implications in terms of trade-offs between internal and external validity associated with each method. Figure 2 displays each empirical method positioned according to the relative benefits of internal versus external validity.

It can be observed in Figure 2 that experimental studies have in general higher internal validity due to the presence of control group. In particular, lab experiments are the method with the highest internal validity and the lowest external validity. Moving from lab to natural experiments, there is an increase in external validity due to the use of more representative samples (natural experiments), less artificial environments (field experiments), and more heterogeneous participants (crowdsourcing experiments), associated with a decrease in internal validity caused by the use of less controlled settings (natural experiments), naturally occurring environments (field experiments), and online platforms (crowdsourcing experiments).

It can also be noted that pre-structured archival studies have the highest external validity due to the use of large dataset and the lowest internal validity due to selection and endogeneity problems. We consider that pre-structured archival studies and large-scale surveys have about similar degrees of internal validity, while the external validity is decreasing due to low response rates for large-scale surveys. Proprietary archival studies and single entity surveys are the non-experimental methods with the lowest external validity due to the use of dataset that is specific for a single organization and, at the same time, with the highest internal validity due to the consideration of context-specific information.
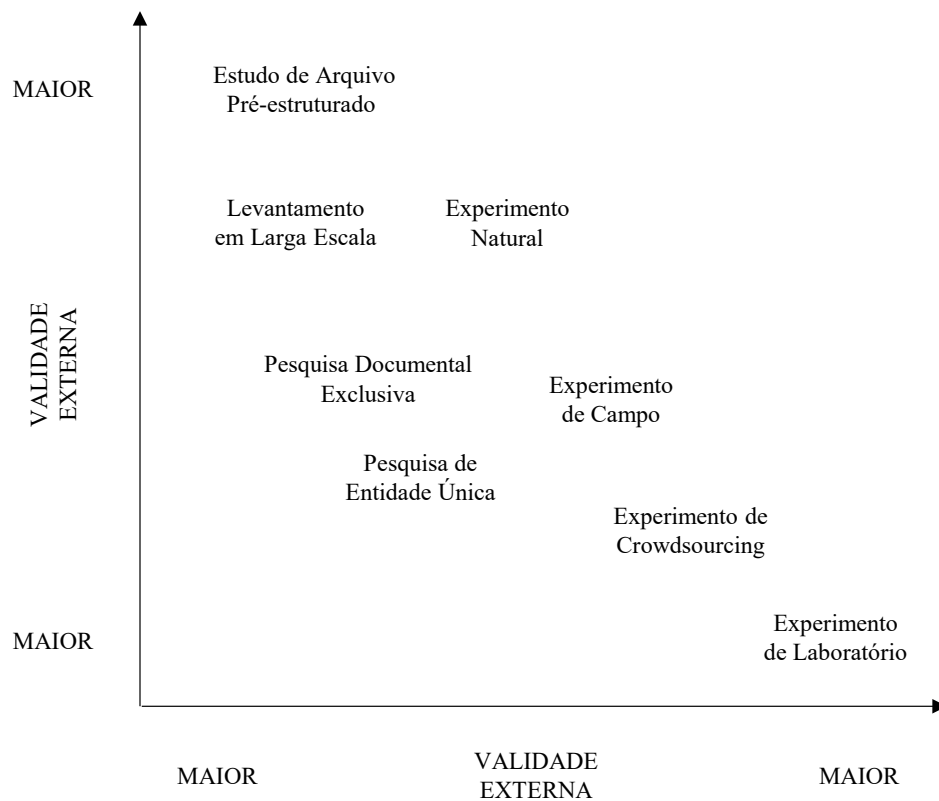

Figure 2. Trade-offs between internal and external validity for each empirical method

4. Conclusion

This study proposes a typology of quantitative empirical research in MA and discusses the main implications of the proposed typology for the validity framework. In particular, building on two criteria (control group and sample representativeness), we propose eight quantitative empirical methods that MA researchers can use when addressing their research questions, including experimental (lab, crowdsourcing, field, and natural experiments) and non-experimental (single entity surveys, proprietary archival studies, large-scale surveys, and pre-structured archival studies) alternatives. We focus on the implications of the proposed typology for the trade-offs between internal and external validity.

The proposed typology and the validity implications can benefit junior MA researchers in Brazil in several ways. First, this study can help broaden the scope of research questions to be investigated. For instance, if the researcher is interested to examine the role of value statements on employees' behaviour, alternative methods can be used such as designing lab experiments and manipulating value statement to capture employees' responses; accessing single organizations to use available data on employees' understanding of organizational values; or collect survey responses from employees located in different organizations on their perceptions of organizational values and behavioural responses (e.g., goal commitment).

Second, this study can help MA researchers to build research programs involving the sequential use of alternative methods to address the same research question, with the evident benefit of replication and generalization of results. For instance, the behavioural effects of tight budgetary controls examined in large-scale surveys can be further examined in experimental designs to offer stronger evidence of causality. Third, this study can help MA researchers identify alternative methods to examine research questions that are not suitable to be addressed through conventional methods (e.g., large-scale surveys). For instance, if the research question is to examine COVID-19 effects on employees' use of accounting information for decision making, researchers could have access to an organization and collect proprietary data about frequency of use of accounting information prior and post the beginning of the pandemics in a natural experiment and then examine whether this use has been altered.

Finally, we call the attention of junior MA researchers to the implications of the selected empirical method for the trade-offs between internal and external validity. By choosing one method over the other, the researcher is also selecting the relative importance placed on internal versus external validity. For instance, lab experiments increase internal validity, while create challenges for external validity. Conversely, pre-structured archival studies boost external validity, but pose higher internal validity threats. Then, while causal claims are more feasible when lab experiments rather than pre-structured archival studies are used, seeing that the researcher follows appropriate procedures to enhance internal validity, generalizability claims are more feasible when pre-structured archival studies rather than lab experiments are used, again seeing that appropriate procedures to enhance external validity is adopted.

In any case, we recommend that junior MA researchers care about their design choices since "The research findings are inevitably the product of the research design" (Dyckman & Zeff, 2014, p. 697). In particular, two points can help with the choice of the empirical method. First, the choice of the empirical method should not be driven by the availability of a specific dataset or the curiosity in using a specific method but instead by the research question (Kinney 2019; Dyckman & Zeff, 2014). While the exploration of different methods can be valuable for acquiring new research skills, the research question should come in the first place to guide this decision. The benefits in terms of increased chances of publication are higher when researchers obtain deep knowledge on how to use specific empirical methods because each method involves a different protocol to be followed to deal with validity threats. Then, regardless of the method selected, researchers are expected to apply appropriate research protocols, according to the best practices stablished in the area, when conducting the study. Second, researchers will be better off by choosing an empirical method that is feasible, given existing constraints, such as data availability, access to organizations, time, and money.

MA researchers are becoming increasingly creative in how to gather data through the use of mono-method as well as multi-method research designs. For mono-method studies, MA researchers are taking advantage of internal validity associated with experimental studies and external validity associated with archival studies by running quasi-experimental studies, using proprietary archival data and design choices typical of experimental studies, such as pre- and post-measures (e.g., Brüggen, Grabner, & Sedatole, 2021; Forker, Grabner, & Sedatole, 2020). For multi-method studies, MA researchers are combining different data collection procedures (e.g., Bol, Braga de Aguiar, & Lill, 2020; Wouters & Wilderom, 2008). The main benefit of combining different methods is to increase sources of relevant data and provide stronger results by using methods that complement each other, such as proprietary archival data on employee performance combined with perceptual measures on employees' motivation captured through single entity surveys.

While we discuss about the implications of each method for the trade-offs between internal and external validity, we acknowledge that construct and conclusion validity are also critical for establishing valid results. Construct validity refers to "the validity of inferences about the higher order constructs that represent sampling particulars", while conclusion validity refers to "the validity of inferences about the correlation (covariation) between treatment and outcome" (Shadish et al., 2002, p. 38). Overall, these four validity types are interdependent and the use of the predictive validity framework, also known as Libby Boxes, can be helpful for researchers better visualize their research design as well as identify potential validity threats.

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Value Added Statement: how the wealth created by branches of economic activity was distributed from 1999 to 2018?

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Abstract

Purpose: This study aimed to verify the extent to which the distribution of the wealth generated by the largest publicly-held and private companies from the main branches of economic activity operating in Brazil differs in terms of the tax burden, capital remuneration (own and third parties) and personnel remuneration from 1999 to 2018.

Methodology: Value Added Statements of the largest publicly held and private companies included in the Accounting Actuarial and Financial Research Institute Foundation database between 1999 and 2018 were analyzed using multiple linear regressions. The Mann-Whitney test was performed to identify significant differences in the wealth distributed by the main sectors.

Results and contributions: The results indicate significant differences in the distribution of the wealth generated by the main branches of the economy (manufacturing, trade, services, financial institutions, and insurance companies) to employees, shareholders, and creditors. Differences were also found in the proportion of wealth allocated to the government through taxes. This study's main contributions include presenting a significant imbalance in the distribution of the wealth generated by the different branches of economic activity; the manufacturing, trade, and services branches bore a much higher tax burden than banks and insurance companies over the 20-year-period, negatively impacting the amount these three branches distributed to employees and shareholders.

Keywords: Added Value, Distribution of Wealth, Tax Burden, Economic Activities

1. Introduction

The relevance of accounting information, understood as information that has confirmatory or predictive value and makes a difference in users' decisions, can be observed from several perspectives depending on the different interests of different users. In this sense, companies need to coordinate the interests of various stakeholders (Freeman, 1984) to minimize adverse effects resulting from conflicts of interest.

According to Haller & Stade (2014), under the concept of stakeholder theory, a company is seen as a coalition of different stakeholders, in which the creation of value results from collective effort; thus, the existence of a company is only ensured if it can create sufficient value to meet the interests of all stakeholders. Additionally, the International Integrated Reporting Council (IIRC, 2013) states that value is created over time through the application of financial and human capital, among other resources, and is unlikely to be created through the maximization of capital to the detriment of other factors.

Thus, disclosing information that allows different stakeholders to assess the wealth a company creates and verify how it is distributed to the various economic agents that contributed to its generation is essential because it shows the company's policy and priorities (Pinto & Freire, 2013). Additionally, IIRC (2013) states that it is essential to show stakeholders how the company interacts with its external environment and the different types of capital used to create value over time.

In this sense, the Value-Added Statement (VAS) was created to provide stakeholders (investors, employees, government, suppliers, etc.) with relevant information regarding wealth generation and provide society with elements to choose from among companies (Cunha, Ribeiro & Santos, 2005). Santos (2007) states that VAS aims to highlight the companies' contribution to the economic and social development of the region where it is installed, showing how much wealth it adds to the local economy and how wealth is distributed among production factors. It can also be used to evaluate public and tax policies and discuss salary policies. Hence, it is a form of accountability to society.

Therefore, based on information provided by VAS, studies compare the distribution of the wealth generated by companies by analyzing the tax burden in the trade, manufacturing, and service sectors (Santos & Hashimoto, 2003); comparing the tax burden across different presidential terms (Santos, Cunha, De Luca & Ribeiro, 2013; Koprowski et al., 2020); differences in the distribution of wealth between national and foreign banks (Pinto & Freire, 2013); between trade, manufacturing, and service companies (Cunha, Ribeiro & Santos, 2005); and between Brazilian agricultural cooperatives and for-profit organizations (Londero, Stanzani & Santos, 2019). Additionally, other studies corroborate that organizational and sectorial characteristics strongly influence wealth distribution (Mazzioni et al., 2020; Hosser et al., 2020).

Thus, based on the literature and considering that it does not include a joint analysis of the main economic branches, being restricted to the analysis of short periods, this study aims to answer the following research question: **To what extent does the amount of wealth distributed among the main branches of economic activity (industry, commerce, services, financial institutions, and insurance companies) differ, considering the accounting concept of added value disclosed in the VAS?**

This study's objective is to verify to what extent the distribution of the wealth generated by the largest publicly held and private companies in the main economic branches operating in Brazil differs in terms of the tax burden, remuneration of capital (own and third parties), and employee remuneration from 1999 to 2018.

Considering stakeholders and potential conflicts inherent to these groups, we expect a significant difference in the distribution of the wealth generated by the main branches of the economy among employees, shareholders, and creditors, due to the risks involved in the different economic activities, company assets structure, and the level of the workforce qualification, among other factors.

Regarding tax burden, although some studies indicate that the trade, industry, and service sectors are highly taxed (Santos & Hashimoto, 2003; Cunha, Ribeiro & Santos, 2005) and that this may change depending on the presidential term (Santos, Cunha, De Luca & Ribeiro, 2013), we expect no significant differences in the proportion of the wealth allocated to the government, considering that the companies are under the same jurisdiction and the Federal Constitution of 1988 establishes, according to the isonomy principle, equal treatment among taxpayers.

Thus, this study's relevance lies in presenting how the wealth generated by the largest companies in the main branches of the economy was distributed over 20 years, showing the significant differences in the amount of wealth distributed to each stakeholder. This study's results complement previous studies mainly based on descriptive statistics and the analysis of some sectors of the economy (i.e., cooperatives, banks) to highlight differences in wealth distribution. This study also expands the discussion concerning the analysis of tax burden based on the VAS among the main branches of the economy (including financial institutions and insurance companies), an aspect not addressed in previous research.

2. Theoretical Framework

2.1 Added Value – concepts

The concept of added value has been discussed for over 200 years, but the most straightforward records from an accounting perspective only began in the late 1970s. According to Consenza (2003) and Machado, Macedo & Machado (2015), in 1975, the United Kingdom was a central player in discussions concerning the Corporate Report published by the Accounting Standards Steering Committee (current Accounting Standards Committee). This report encouraged the disclosure of the added value statement through the Accounting Standards Committee, besides using this information to improve communication with employees and devise payment plans and incentives based on the generated added value.

As for the measurement of created wealth, it is important to note that there are conceptual differences between accountancy and economics. For example, economics understands added value as the result of the difference between the gross value of production and intermediate consumption (Simonsen, 1979), i.e., it represents the wealth a company creates and, therefore, its contribution to the Gross Domestic Product (GDP).

Haller & Stade (2014) show that added value can be calculated in two different manners; the first focused on performance aspects (indirect method), which reveals that value creation takes place through an entity's activities. The second focuses on social aspects (direct method), which consists of the sum of the remuneration of production factors "labor" and "capital," and the society, which is represented by the public sector (Government). In other words, the direct method focuses on the distribution of wealth in an economy. Figure 1 presents the two ways proposed by the authors:
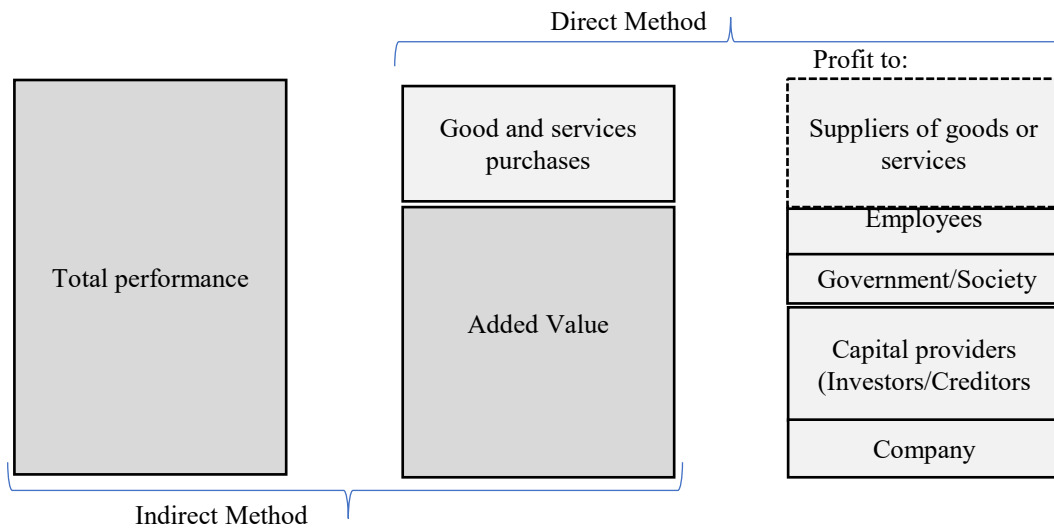
Figure 1. Basic concept of added value (Haller & Stade, 2014)

According to the direct model, added value shows the contribution (created wealth) of a company to the national economy and the company's monetary contribution to the wealth of various groups in society.

From the accounting perspective, added value is the difference between sales and the costs of inputs (including depreciation) (De Luca, 2009). Thus, the difference between economics and accountancy is only temporal because economics uses production as a factor to identify generated wealth, while accounting uses the concept of revenue realization, that is, it is based on the accrual basis (Gelbcke, Santos, Iudícibus & Martins, 2018). Figure 2 presents an adaptation of Figure 1 to represent the accounting perspective of the added value measurement.
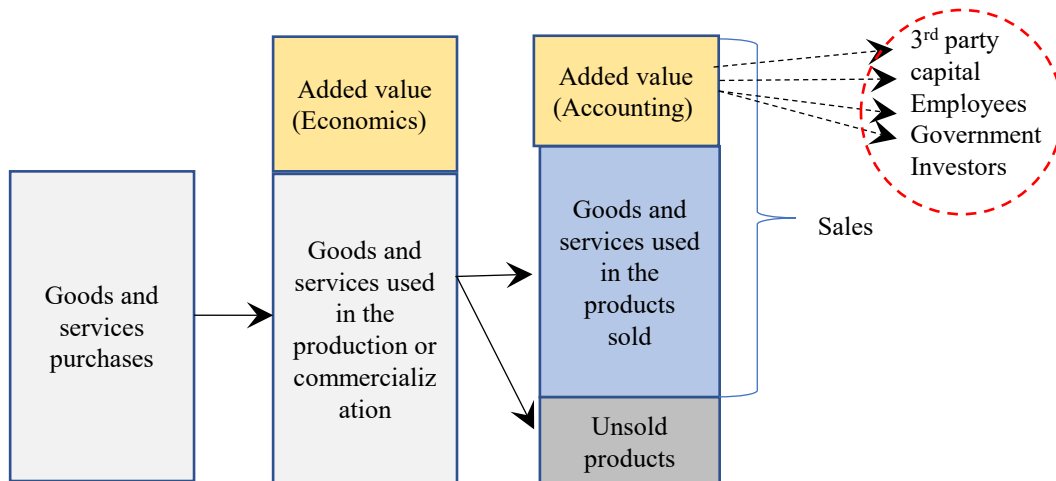
Figure 2. Accounting measurement of added value (prepared by the authors)

Figure 2 shows that added value from the accounting perspective must be validated by the market (sales) and distributed among the agents that contributed to its generation; unsold production is not included in the measurement of generated wealth.

It is worth noting that added value calculated according to the accounting concept is disclosed in the VAS, which, by presenting the amount of wealth distributed, shows a company's ability to meet the interests of multiple stakeholders, revealing a trade-off between the agents that contributed to the generation of wealth.

2.2 Added Value Statement – Social Accountability

VAS is the accounting statement that aims to show the wealth generated by a company in a given period and its distribution to those who contributed to creating it. It is a differentiated statement of a social nature because it is not restricted to showing profit as a result of deductions and financial efforts, but it presents productivity, sharing, and the social impact on the environment to which such an entity belongs.

According to Cunha (2002), VAS also shows the investors' profit, to whom the other part of the wealth generated by the company is distributed, reflecting a business concern based on social responsibility and the need to remunerate the production factors that helped to generate the company's wealth. Cunha, Ribeiro & Santos (2005) show that the VAS is an instrument able to highlight both economic and social aspects, constituting a valuable measure of these relationships, presenting its ability to generate wealth through the benefits organizations offer to society, for instance, through the workforce it absorbs from the community; hence, its ability to contribute to economic development.

It is worth noting that, although VAS is not a mandatory statement required by international accounting standards, Global Reporting Initiative (GRI) considers the direct economic value generated and distributed (EVG&D) to be a performance indicator, which is information that is very close to the added value disclosed in VAS.

Based on informational benefits, in 2008, the disclosure of VAS became mandatory for publicly held companies in Brazil, with the enactment of Law No. 11,638, from December 28th, 2007. The National Electric Energy Agency had already made it mandatory before it was required by law (Resolution No. 444, from October 26th, 2001) though and was strongly encouraged by the Securities and Exchange Commission (CVM) (CVM Guideline No. 24 of January 15th, 1992 and CVM/SNC/SEP Circular Letters No. 1 of December 29th, 2000 and No. 1 of February 14th, 2007) and Federal Accounting Council (NBC 3.7).

In summary, VAS can be seen as a statement that gives society an account of a company's ability to generate wealth and how it is distributed among stakeholders. Hence, several studies use the information disclosed in VAS to understand the ability of companies to generate wealth and benefit society from different perspectives, for instance, employee remuneration and payment of taxes to the Government, among others.

Santos & Hashimoto (2003) used VAS to study the impact of taxes on organizations from 1996 to 2001 and found that, in general, the tax burden represents the most significant component in the distribution of wealth generated by organizations, absorbing approximately 40% of the total amount generated. Based on data released by the Brazilian Federation of Banks (Febraban), the study also highlights that the tax burden was the heaviest in the beverages and tobacco, chemicals and petrochemicals, and telecommunications sectors. Additionally, the productive sectors of the economy (manufacturing, trade, and services) were the most heavily taxed when compared with the banking sector.

Ribeiro & Santos (2004) analyzed the relationship between added value, remuneration, and the number of resources that financed the assets of electricity distribution companies from 1998 to 2002. The results showed that the portion of wealth that remunerates "financing entities" (own and third-party capital) was mainly allocated to external financing agents. Finally, using descriptive analysis, Cunha, Ribeiro & Santos (2005) analyzed the generation and distribution of wealth by companies from different activity sectors (manufacturing, trade, and services) from 1999 to 2003. The authors concluded that the indicators obtained from VAS were an excellent evaluator of the distribution of wealth available to society, revealing expressive tax burden and a large percentage used to remunerate third-party capital.

Scarpin et al. (2014) studied the correlation between the added value distributed to workers and the profitability of organizations based on a sample of more than 700 companies from 21 economic sectors from 2007 to 2010. The authors verified the existence of strong correlations between the companies' profitability and the amount distributed to employees. Additionally, according to the authors, the most prominent sectors were: wholesale, retail, chemical, and petrochemical.

Regarding the banking sector, Pinto & Freire (2013) found significant differences in the average added value, remuneration of own capital, and distribution to personnel when comparing foreign and national banks. Furthermore, when studying the behavior of added value in the largest banks in Brazil from 2000 to 2009, Taiarol, Raimundini & Behr (2011) found a strong correlation between internal social investments and added value, with personnel expenses being the main element of wealth generation.

As for the political context, Santos, Cunha, De Luca & Ribeiro (2013) analyzed the behavior of wealth created by companies and its distribution in the Fernando Henrique Cardoso and Lula governments, showing different profiles of wealth distribution. They found that third-party remuneration and tax collection were prioritized from 1995 to 2002, while from 2003 to 2009 priority was given to personnel remuneration and shareholders. Koprowski et al. (2020) analyzed the amount of wealth distributed to the government and the history of revenues earned during the presidential terms of Lula (2007-2010) and Dilma (2011-2014). The conclusion is that changes in revenues did not correspond to the changes in the amount of wealth allocated to the public coffers; only in two sectors did the wealth distributed to the government result from a growth in revenue in the Lula and Dilma governments.

Regarding non-profit companies, Londero, Stanzani & Santos (2019) analyzed the creation and distribution of wealth in Brazilian agricultural cooperatives based on VAS, studying their profile and comparing it to for-profit companies. The analyses showed that most of the wealth was distributed to employees and that the tax burden was similar to other types of organizations, noting that the amounts received by cooperative members were greater than those received by investors. Such a finding was expected considering the purpose of cooperatives.

In this sense, according to Mazzioni et al. (2020), identifying the factors determining how the wealth generated by companies is distributed can help society identify what type of organization is the most beneficial for each economic agent. Additionally, Bispo, Calijuri & Lima (2009) show that comparative studies between different periods and economic sectors can help to devise economic and social planning policies (tax and salary policies).

3. Method

This theoretical-empirical study uses quantitative data analysis to answer the guiding questions. The sample adopted in this study is non-probabilistic and comprised the largest public-held and private companies in Brazil that published VAS from 1999 to 2018 and were listed in the Fipecafi database. The manufacturing, trade, services, banking, and insurance sectors were analyzed; 20,624 observations were obtained (Table 1).

Table 1
Number of companies analyzed according to sector and year

| Year | Number of companies | | | | | |
	Industry	Trade	Services	Banks	Insurance companies	Total
1999	550	120	272	74	0	1,016
2000	616	143	317	53	0	1,129
2001	601	125	305	77	53	1,161
2002	615	149	314	82	59	1,219
2003	617	164	341	67	57	1,246
2004	555	132	332	76	62	1,157
2005	588	172	366	69	60	1,255
2006	596	172	329	70	63	1,230
2007	569	168	324	62	61	1,184
2008	480	154	288	63	49	1,034
2009	438	152	277	67	55	989
2010	407	142	296	46	58	949
2011	398	152	297	46	32	925
2012	398	148	307	57	57	967
2013	391	135	315	49	32	922
2014	367	154	332	56	51	960
2015	299	124	281	59	54	817
2016	267	128	288	57	52	792
2017	300	136	293	55	60	844
2018	289	132	296	56	55	828
Total	9,341	2,902	6,170	1,241	970	20,624

The monetary values presented in this study are expressed in dollars and were based on the amounts disclosed in the statements published by the companies and updated to the purchasing power currency of December 31, 2018. The parity used to convert the amounts from Reais into Dollars was R$3.8748 for every US$1.00.

Multiple linear regressions were performed to verify whether there were significant differences in the distribution of wealth to the agents that contributed to its generation in the five sectors analyzed. The regressions related the amount allocated per year (for 20 years) to a given agent to the total wealth generated per year according to the sector (variable X) and compared it to the portion allocated per year by each of the other sectors to this same agent (variable Y). Additionally, the Mann-Whitney test was used to identify significant differences in the proportion of wealth distributed to the respective beneficiaries of each sector.

4. Results

The analyses performed on the sample are divided into three phases. The first phase shows the total wealth generated by the sectors and its distribution among the agents that contributed to its generation: government, personnel, external financing agents, and investors. The second phase compares the distribution of wealth among the agents, and finally, in the third phase, a quantitative analysis was conducted to verify whether there were significant differences in the distribution of wealth among the sectors.

4.1 Total Wealth Generation and Distribution

4.1.1 Total Wealth Generated

The results presented in this section were obtained from consolidated data of the companies that composed the sample each year. Table 2 presents the total wealth generated per year and industry.

Table 2

Total wealth generated by sector

Year	N° of companies	(Values in US$ million from December 2018)					
		Manufacturing	Trade	Services	Total (*)	Banks	Insurance companies
1999	1,016	125,925	13,144	69,303	208,372	39,499	-
2000	1,129	130,638	17,060	71,758	219,456	33,747	-
2001	1,161	134,435	16,764	74,342	225,540	37,108	3,583
2002	1,219	159,430	17,679	84,880	261,989	47,503	4,397
2003	1,246	138,185	17,215	77,198	232,598	35,960	3,145
2004	1,157	142,486	16,050	87,229	245,765	40,162	3,685
2005	1,255	96,373	18,252	95,191	209,815	39,860	6,117
2006	1,230	93,391	17,150	98,434	208,975	42,669	7,265
2007	1,184	166,986	17,367	112,056	296,410	47,693	6,975
2008	1,034	119,214	20,085	102,800	242,099	45,886	8,729
2009	989	128,333	17,064	93,639	239,037	56,864	10,729
2010	949	162,445	22,268	98,223	282,936	59,831	11,509
2011	925	155,438	25,161	93,695	274,294	59,323	9,427
2012	967	137,037	23,941	86,456	247,433	59,937	11,684
2013	922	131,286	27,524	84,731	243,541	52,125	5,351
2014	960	98,527	27,210	88,290	214,027	60,548	14,049
2015	817	124,113	22,970	92,980	240,063	47,982	16,136
2016	792	120,180	25,851	100,995	247,026	65,087	16,099
2017	844	117,324	27,689	92,390	237,403	63,263	9,688
2018	828	144,640	32,354	107,227	284,222	62,670	9,398
Average percentage		53.9%	8.7%	37.4%	100%		

(*) *Does not include banks and insurance companies.*

An analysis of the progression of the total wealth generated by the largest companies operating in Brazil shows that the five sectors presented real growth over time. The manufacturing sector is the most representative, followed by services and banks.

4.1.2 Distribution of Total Wealth

Due to the conceptual differences in the calculation of wealth between the different sectors, wealth distribution was analyzed by grouping the manufacturing, trade, and services sectors, separating the banking and insurance sectors. Table 3 presents the distribution of the total wealth generated by the manufacturing, trade, and service sectors among the agents that contributed to its generation: government, personnel, external financing agents, and shareholders.

Table 3
Total wealth distributed among agents (Values in US$ million from December 2018)

Year	Industrial, trade, and service sectors				
	Government	Personnel	Funders	Shareholders	Total
1999	76,321	46,047	83,390	2,614	208,372
2000	94,524	47,667	46,486	30,779	219,456
2001	93,061	45,459	63,467	23,554	225,540
2002	104,374	45,414	107,746	4,455	261,989
2003	107,607	41,437	40,725	42,829	232,598
2004	116,716	41,973	37,093	49,983	245,765
2005	89,304	41,461	33,990	45,060	209,815
2006	89,733	45,586	32,735	40,921	208,975
2007	140,778	54,433	38,377	62,822	296,410
2008	88,471	48,435	66,566	38,627	242,099
2009	97,864	45,937	38,167	57,069	239,037
2010	113,743	52,504	43,582	73,106	282,936
2011	108,409	52,494	50,025	63,367	274,294
2012	104,794	57,254	52,502	32,884	247,433
2013	96,212	63,250	62,086	21,994	243,541
2014	74,769	55,630	53,940	29,687	214,027
2015	97,407	51,707	110,873	-19,923	240,063
2016	95,033	50,846	73,505	27,641	247,026
2017	96,248	50,978	68,837	21,339	237,403
2018	108,893	51,253	72,066	52,010	284,222
Average %	41%	20.5%	24.3%	14. d2%	

Most of the wealth generated in the manufacturing, trade, and service sectors from 1999 to 2018 was allocated to the government through taxes, fees, and contributions, with an average annual distribution of 41%. In the same period, the amount of wealth delivered to external financing agents was 24.3% per year on average; 20.5% was allocated to employees and 14.2% to shareholders. In 2015, however, shareholders' wealth decreased because of a considerable increase in the share allocated to external financing agents.

Table 4 presents the distribution of total wealth generated by the banking sector.

Table 4

Total wealth distributed among agents (Values in US$ million from December 2018)

Year	Banking sector				
	Government	Personnel	Funders	Shareholders	Total
1999	6,032	21,385	1,603	10,479	39,499
2000	6,524	20,206	1,247	5,769	33,747
2001	7,185	20,392	1,211	8,321	37,108
2002	9,563	20,481	1,508	15,950	47,503
2003	7,986	14,981	1,004	11,990	35,960
2004	9,100	17,084	1,362	12,616	40,162
2005	9,365	15,929	1,282	13,284	39,860
2006	8,421	18,020	1,240	14,988	42,669
2007	8,404	19,772	1,340	18,178	47,693
2008	7,916	18,846	1,166	17,958	45,886
2009	14,364	20,760	1,779	19,961	56,864
2010	13,721	21,901	1,785	22,424	59,831
2011	10,522	23,674	1,892	23,235	59,323
2012	11,107	25,233	2,081	21,517	59,937
2013	10,070	20,458	1,877	19,720	52,125
2014	9,789	25,925	2,376	22,457	60,548
2015	-4,994	26,746	2,345	23,886	47,982
2016	18,813	25,948	2,280	18,047	65,087
2017	13,171	26,061	2,252	21,778	63,263
2018	12,206	24,962	2,084	23,417	62,670
Average %	18.8%	43.7%	3.4%	34.1%	

Note that most of the wealth generated by banks from 1999 to 2018 was translated into personnel remuneration, in the form of salaries, taxes, and benefits, with an average annual distribution of 43.7%. In the same period, the amount of wealth allocated to shareholders was 34.1% per year, on average; 18.8% to the government and 3.4% to external financing entities. It is worth highlighting that in 2015 an increase in the CSLL rate made institutions recognize tax credits related to social contribution (deferred assets), generating a credit result, i.e., indicating wealth that was not distributed to the government. Excluding the effect of the deferred tax of the institutions most heavily impacted (Banco do Brasil, Banco Bradesco, Caixa Econômica Federal, Itaú Unibanco, and BTG Pactual), the amount distributed to the government would be 5.3% of the wealth generated in the year.

Table 5 presents the distribution of total wealth generated by the insurance sector.

Table 5
Total wealth distributed among agents (Values in US$ million from December 2018)

Year	Insurance sector				
	Government	**Personnel**	**Funders**	**Shareholders**	**Total**
1999	-	-	-	-	-
2000	-	-	-	-	-
2001	701	1,120	272	1,491	3,583
2002	798	1,234	811	1,554	4,397
2003	636	881	209	1,419	3,145
2004	805	950	147	1,784	3,685
2005	1,253	1,061	631	3,170	6,117
2006	1,598	1,214	824	3,630	7,265
2007	1,656	1,099	1,044	3,175	6,975
2008	1,564	1,070	2,243	3,852	8,729
2009	1,724	1,021	3,885	4,099	10,729
2010	2,290	1,267	3,368	4,584	11,509
2011	2,194	1,064	2,992	3,177	9,427
2012	2,581	1,545	4,059	3,498	11,684
2013	1,575	1,023	64	2,689	5,351
2014	3,314	1,451	4,872	4,412	14,049
2015	3,405	1,409	6,561	4,761	16,136
2016	3,290	1,355	7,627	3,828	16,099
2017	3,032	1,401	1,710	3,545	9,688
2018	3,027	1,369	1,582	3,419	9,398
Average %	22.4%	16.4%	21.6%	39.6%	

Most of the wealth generated by the insurance sector in the period was allocated to shareholder remuneration, such as dividends and retained profits, with an average annual distribution of 39.6%. In the same period, the share of wealth delivered to external financing entities was 21.6% per year on average, 22.4% to the government, and 16.4% to employees.

According to Rensi and Carvalho (2021), Operação Lava Jato (OLJ) negatively impacted the insurance industry as a whole, contributing to the sector's downturn since its inception, which possibly explains a decrease in the wealth generated from 2017 onwards (Table 5).

4.2 Distribution of Wealth by sector

This section presents the distribution of wealth generated by the different sectors among the agents that contributed to its generation.

4.2.1 Distribution of Wealth to the government (tax burden)

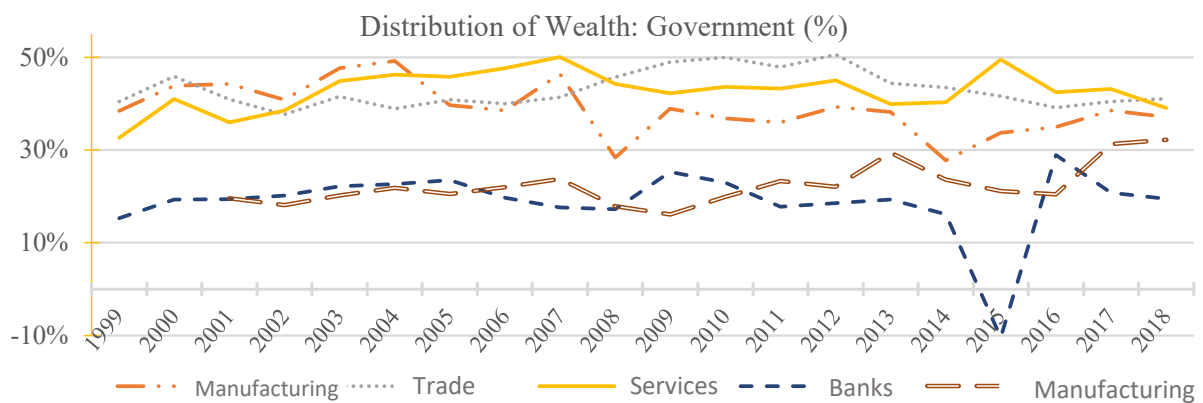Figure 3 presents wealth distributed to the government.

Figure 3. Distribution of wealth to the government (tax burden).

The manufacturing, trade, and service sectors were those allocating most of the wealth they created to the government in the form of taxes. The trade and service sectors presented an average annual tax burden of 43% and 42.8%, respectively, while the manufacturing sector presented an average annual distribution of 38.9%. In the case of banks and insurance companies, the allocation of wealth to the government presented an annual average of 18.8% and 22.4%, respectively, i.e., practically half of the tax burden bore by the other branches.

Based on the results shown in Figure 3, and to expand the tax burden analysis, we verified whether there were any relevant changes in tax policies due to the different presidential terms.

Table 6

Wealth distributed to the government by presidential terms

Year	Wealth Distribution – Government Tax Burden						Government
	Industry	**Trade**	**Services**	**Banks - Febraban**	**Banks - Fipecafi**	**Insurance companies**	
1999	38.4%	40.5%	32.6%	22.6%	15.3%	N.A.	FHC
2000	43.9%	45.9%	41.0%	25.8%	19.3%	N.A.	
2001	44.2%	40.9%	35.9%	27.5%	19.4%	19.5%	
2002	40.8%	37.6%	38.5%	23.1%	20.1%	18.2%	
FHC average	**41.8%**	**41.2%**	**37.0%**	**24.8%**	**18.5%**	**18.9%**	
2003	47.6%	41.5%	44.9%	25.2%	22.2%	20.2%	Lula
2004	49.2%	38.9%	46.3%	26.2%	22.7%	21.8%	
2005	39.7%	40.9%	45.8%	25.1%	23.5%	20.5%	
2006	38.5%	39.9%	47.6%	25.9%	19.7%	22.0%	
Lula average	**43.8%**	**40.3%**	**46.1%**	**25.6%**	**22.0%**	**21.1%**	
2007	46.4%	41.4%	50.0%	24.3%	17.6%	23.7%	Lula
2008	28.4%	45.7%	44.2%	18.7%	17.3%	17.9%	
2009	38.9%	49.0%	42.3%	27.3%	25.3%	16.1%	
2010	36.8%	49.9%	43.6%	28.2%	22.9%	19.9%	
Lula average	**37.6%**	**46.5%**	**45.0%**	**24.6%**	**20.8%**	**19.4%**	
2011	35.9%	47.9%	43.2%	22.9%	17.7%	23.3%	Dilma
2012	39.3%	50.6%	45.0%	23.0%	18.5%	22.1%	
2013	38.2%	44.4%	39.9%	23.3%	19.3%	29.4%	
2014	27.7%	43.5%	40.3%	23.9%	16.2%	23.6%	
Dilma average	**35.3%**	**46.6%**	**42.1%**	**23.3%**	**17.9%**	**24.6%**	
2015	33.7%	41.6%	49.5%	1.4%	-10.4%	21.1%	Dilma/Temer
2016	34.9%	39.2%	42.5%	N.A.	28.9%	20.4%	
2017	38.5%	40.4%	43.2%	N.A.	20.8%	31.3%	
2018	37.1%	41.0%	39.1%	N.A.	19.5%	32.2%	
Dilma/Temer average	**36.1%**	**40.6%**	**43.6%**		**14.7%**	**26.3%**	

N. A.= not available

Table 6 shows an increase in the amount of wealth allocated to the government in Lula's first term compared to FHC's second term; the service sector was the one showing a significant increase. There was a significant decrease in taxation for the manufacturing sector and a significant increase for the trade sector in Lula's second term. Dilma's first government dropped taxation for the manufacturing, services, and banking sectors and increased it for the insurance sector. In Dilma/Temer's second term, there was a decrease in the taxation of the trade sector and an increase in the other sector. It is worth noting that, although there was an increase in the CSLL rate in 2015 for the banking sector, there was a benefit arising from the recognition of tax credits, causing an effect opposite to what was expected, i.e., a reduction in the amount allocated to the government.

The information available from 1999 to 2015 provided by Febraban, which considers all banks, reveals that the tax burden for this sector was around 23%.

Thus, these results complement those by Santos, Cunha, De Luca & Ribeiro (2013), showing that, regardless of the presidential term, banks and insurance companies have always enjoyed lower tax burdens than other branches of the economy. Hence, we cannot state that tax collection was prioritized in FHC's term compared to Lula's terms; instead, we verified no relevant changes in the tax policies implemented in the years addressed here.

4.2.2 Distribution of Wealth to External Financing Agents

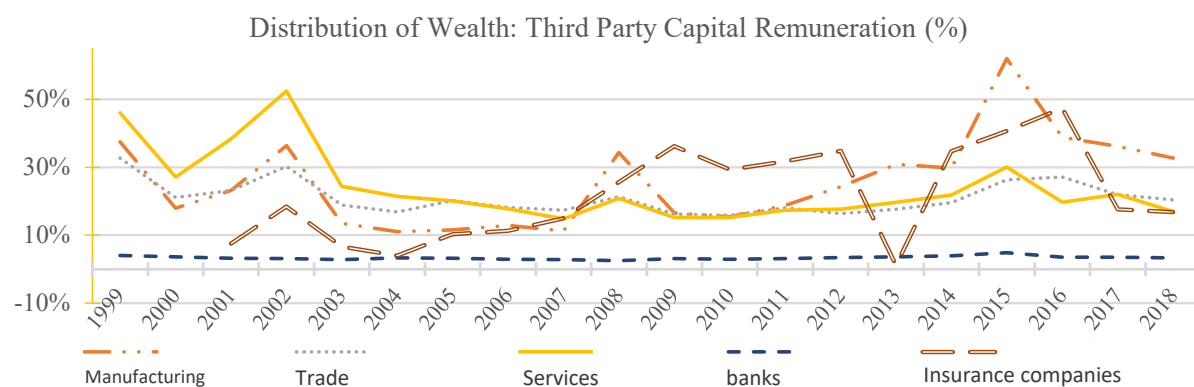Figure 4 shows how the distribution of wealth progressed in the form of interest and rent.

Figure 4. Distribution of wealth to funders

Note that, from 1999 to 2007, the services sector had the highest participation in distributing wealth to external financing agents, followed by the trade and manufacturing sectors. After 2007, there was an increase in the amounts distributed by the manufacturing and insurance companies, followed by the trade and service sectors, while the banking sector presented much smaller participation. As a result, the average annual distribution of wealth generated in the period by the manufacturing, service, insurance, trade, and banking sectors was 25.7%, 24.0%, 21.6%, 21.0%, and 3.4%, respectively.

The amount distributed to remunerate third-party capital is directly related to the basic interest rate of the Brazilian economy, in addition to being impacted by the exchange rate devaluation. The low figure of 3.4% for banks is a consequence of how financial intermediation expenses are classified, considering that, for these companies, these expenses are considered in the wealth net formation and not in its distribution.

4.2.3 Distribution of Wealth to Shareholders

Figure 5 shows the distribution of wealth to shareholders in the form of dividends, equity interest, and retained earnings.
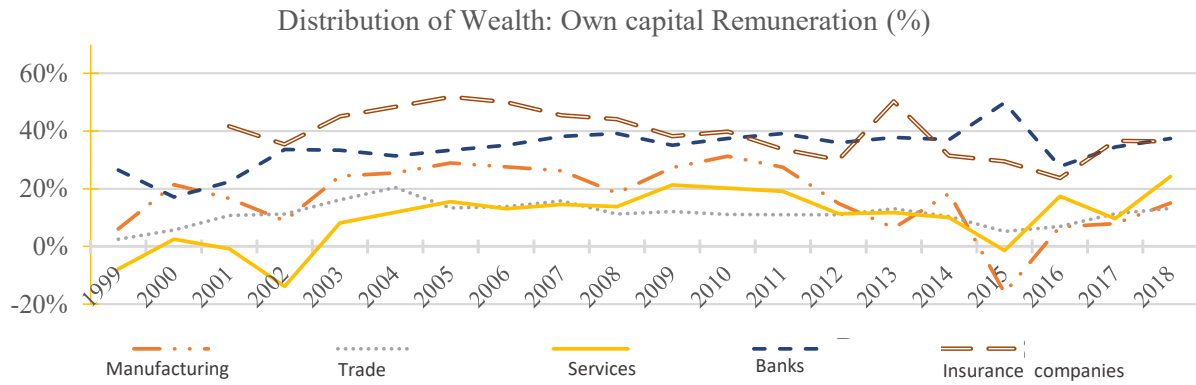
Distribution of Wealth: Own capital Remuneration (%)

Figure 5. Distribution of wealth to shareholders

The analysis of the wealth distributed to partners and shareholders shows that banks and insurance companies were the branches that distributed the highest percentages of wealth to these agents, presenting an average annual distribution of 34.1% and 39.6%, respectively. In addition, the manufacturing sector had an average annual distribution of 17.2%, while in 2015, there was a consumption of wealth (distribution was negative) of 16% due to the economic crisis that began in 2014. In turn, trade had an average distribution of 11.3 % in the period, while the services sector had the lowest participation in the distribution of wealth to partners and shareholders throughout the period, with an average annual allocation of 10.0%.

4.2.4 Distribution of Wealth to Personnel

Figure 6 shows the distribution of wealth as employee compensation in the form of salaries, taxes, and benefits.
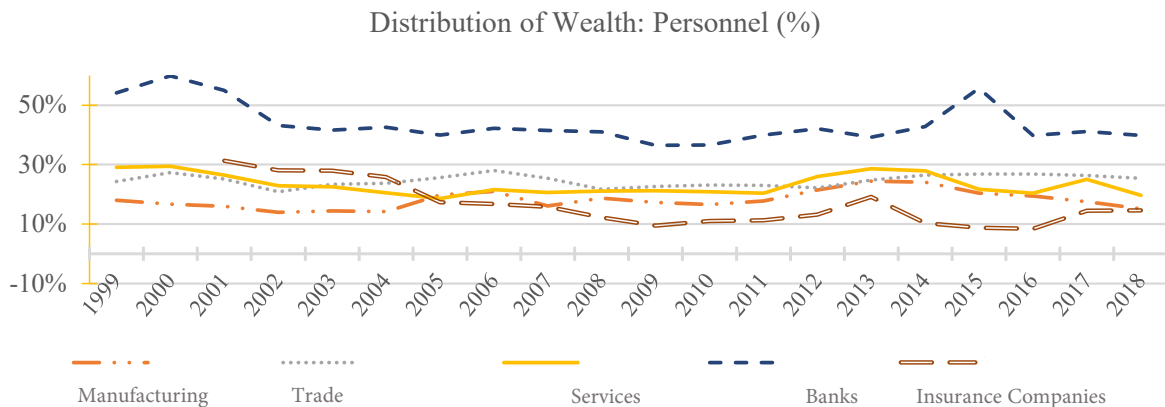
Distribution of Wealth: Personnel (%)

Figure 6. Distribution of wealth to personnel

The analysis of the distribution of wealth to employees shows that the largest share is in the banking sector, with 43.7%, on average. The trade and service sectors allocated approximately 24.7% and 23.2%, while the manufacturing and insurance sectors presented an average annual distribution of 18.2% and 16.4%, respectively.

4.2.5 Distribution of Wealth per Employee

To obtain a more accurate interpretation of the wealth distributed to employees, considering that the number of employees varies among the sectors, we analyzed the amount of wealth distributed per employee. This amount was calculated by dividing the added value distributed to personnel by the average number of employees (average of the number of employees existing at the beginning and end of each year) of the analyzed sectors. Table 7 presents the average number of employees in each branch per year.

The manufacturing sector historically presented the highest average number of employees, accounting for approximately 38.7% of the total number of jobs held by the companies comprising the sample. However, there was a decrease in the number of people employed in this activity from 2014 onwards. The service sector ranked second in the number of employees, accounting for approximately 31.7% of the jobs in the period. However, similar to what happened in the manufacturing sector, the number of employees in the service sector declined from 2015. Banks ranked third in the number of employees, accounting for approximately 14.9% of the jobs held in the period. A point worth mentioning is that the number of bank employees increased in the period, with slight fluctuations in some years. For example, in 2000, the average number of employees was 355,395, and in 2018, it was 469,833; i.e., it presented a growth of 32.2%. The trade sector ranked fourth in the number of people employed, accounting for approximately 13.7%; insurance companies employed fewer people.

Table 7

Average Number of employees

Year	Average number of employees according to branch					
	Industry	**Trade**	**Services**	**Banks**	**Insurance companies**	**Total**
1999	N.A.	N.A.	N.A.	N.A.	N.A.	0
2000	862,590	243,963	640,402	355,395	N.A.	2,102,349
2001	906,442	290,036	698,922	370,158	N.A.	2,265,558
2002	950,558	262,687	707,612	385,050	26,713	2,332,619
2003	986,835	277,035	746,241	356,256	25,156	2,391,523
2004	985,292	296,440	797,388	356,048	22,975	2,458,142
2005	1,013,257	349,502	791,146	387,178	25,122	2,566,204
2006	1,060,453	377,929	821,067	406,013	27,452	2,692,913
2007	1,214,069	346,505	957,461	420,954	28,075	2,967,062
2008	1,384,509	330,419	1,023,220	430,860	28,925	3,197,932
2009	1,308,439	322,831	1,001,486	461,964	29,060	3,123,780
2010	1,280,924	404,248	1,015,226	482,823	31,326	3,214,546
2011	1,412,927	481,746	1,021,995	499,650	32,270	3,448,587
2012	1,423,078	464,993	1,124,253	514,958	33,889	3,561,170
2013	1,431,092	509,212	1,230,559	468,159	31,640	3,670,660
2014	1,399,229	588,313	1,217,866	454,410	30,059	3,689,876
2015	1,226,078	540,340	1,074,076	488,744	34,433	3,363,671
2016	1,037,214	491,968	945,058	487,509	32,810	2,994,558
2017	910,543	562,103	979,424	480,675	31,276	2,964,020
2018	860,290	627,409	1,011,103	469,833	31,354	2,999,988

N.A.= not available

Figure 7 shows how wealth distribution behaved in each sector according to employee per year. The banks distributed the highest amount, approximately US$49,200 per employee/year; insurance companies ranked second, with an average annual distribution of US$40,600 per employee. The manufacturing and service sectors presented an average annual distribution of US$22,700 and US$20,900 per employee, respectively. Finally, the trade sector distributed the lowest wealth per employee, with an average of US$13.300/year.
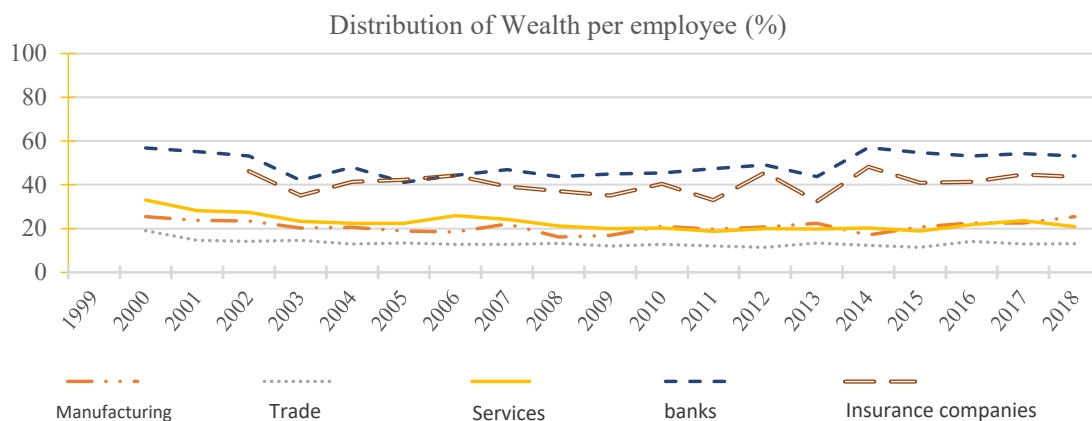

Figure 7. Wealth distributed per employee

Differences in the distribution of wealth per employee may be related to the specialization required by the activities performed in each sector, indicating that remuneration is associated with the level of workforce qualification.

4.3 Analysis of Wealth Distribution by Economic Activity

4.3.1 Distribution of Annual Wealth

Twenty variations of the regression model, represented by Equation 1, were estimated to analyze the percentage of the wealth distributed among government, personnel, external financing agents, and investors. Hence, the relationship between the wealth each branch allocated to the different agents and the total amount generated is presented for 20 years (1999 to 2018). In addition, potential unobservable macroeconomic variations were controlled using dummies for each year.

$$\frac{\sum_{i=z}^{n} DVA_{kz}}{\sum_{i=z}^{n} DVA_{z}} = \beta_0 + \beta_1 Z + \beta_6 X + \varepsilon_t \tag{1}$$

Where z represents each of the sectors: banking, insurance, manufacturing, trade, and services; k represents the agents to which wealth is directed: government, personnel, financing agents, and shareholders; Z is a dummy variable that assumes value 1 for the sectors described above, depending on the sector addressed in each of the equations; and X represents the percentage distributed by the sector analyzed to a given agent per year. Thus, the coefficient of the variable Z corresponds to the average difference of the percentage distributed to the respective agents per sector.

Table 8 presents the results of the 20 models estimated. On average, the distribution of wealth to agents – government, personnel, financing agents, and shareholders – presents a statistically different pattern between the banking, insurance, manufacturing, trade, and service sectors.

Table 8
Wealth Distribution

Variables	Wealth Distribution			
	Government (1)	Personnel (2)	Financing agents (3)	Shareholders (4)
Bank	-0.184***	0.2286***	-0.1988**	0.1543
	(0.0246)	(0.0139)	(0.0215)	(0.0331)
Insurance companies	-0.1362***	-0.1047***	0.0370	0.2033***
	(0.0302)	(0.0286)	(0.0325)	(0.0319)
Manufacturing	0.0690**	-0.0931***	0.0825**	-0.0583
	(0.0314)	(0.0275)	(0.0298)	(0.0369)
Trade	0.1209***	-0.0113**	0.0226	-0.1323**
	(0.0293)	(0.0295)	(0.0311)	(0.0343)
Services	0.1175***	-0.0293	0.0600**	-0.1483***
	(0.0294)	(0.0293)	(0.0304)	(0.0335)
E.F. year	Yes	Yes	Yes	Yes
#Observations	98	98	98	98

*, **, and *** indicate significant coefficients at 10%, 5%, and 1%, respectively. Standard errors are shown in parentheses.

The coefficients of the variables (Z) represent the average difference of the percentage distributed to the respective agents per sector. The analysis does not consider heterogeneity among the companies in the same sector. The purpose is to present the differences in wealth distribution per year according to the sector over 20 years.

Allocation of wealth to the government shows that all the estimated coefficients are significant, indicating significant differences in the distribution of wealth generated by the respective sectors to the government. The coefficients show that the banking sector presented the lowest tax burden on average, followed by the insurance sector. On the other hand, the trade and service sectors bore the highest tax burden.

Regarding employee remuneration, banks were the ones that, on average, distributed the highest wealth to employees, while insurance companies distributed the lowest amount of wealth in the form of salaries. Regarding external financing entities, the manufacturing sector distributed the highest wealth to this agent, followed by the service sector. Finally, for shareholders, the coefficients indicate that, on average, the insurance sector distributed the highest amount of wealth, followed by banks, with the service sector distributing the lowest amount of wealth to partners and shareholders, followed by the trade sector.

Thus, considering the results, the Mann-Whitney test was performed to identify differences among sectors. The analysis compared the sectors (2 to 2) for each of the four agents. Table 9 presents the results of the Mann-Whitney test for wealth distributed to government and employees.

Table 9

Analysis of Wealth Distributed to the Government and Employees

Significant Differences	Government	Employees
Highest means, equal among them	Trade and Services	Banks
Intermediate means, equal among them	Manufacturing(*)	Trade and Services
Lowest means, equal among them	Banks and Insurance companies	Insurance companies and Manufacturing

 (*) no differences at 1% between manufacturing and service sectors (p-value = 0.0161)

Significant differences were found in wealth distribution; the trade and service sectors distributed the highest wealth to the government (closely followed by the manufacturing sector), while banks and insurance companies distributed the least wealth to the government. This result shows that the banking and insurance sectors enjoyed the lowest taxation proportionally to the wealth generated in their activities.

Regarding employees, banks were the ones that distributed the highest amount of wealth, while the insurance and manufacturing sectors distributed the lowest. However, even though insurance companies allocate a small percentage of wealth to employees, the average amount per employee is high, considering this sector employs the lowest number of employees. The trade, service, and manufacturing branches distributed the smallest share of wealth to employees.

Table 10 presents the results of the Mann-Whitney test for the allocations made to external financing agents and investors.

Table 10

Analysis of the wealth distributed to remunerate third-party and Own Capital

Significant Differences	Funders	Shareholders
Highest means, equal among them	Manufacturing, Trade, Services, and Insurance Companies	Banks and Insurance Companies (*)
Intermediate means, equal among them	-	Manufacturing companies (**)
Lowest means, equal among them	Banks	Trade and Services

(*) no significant differences at 1% (p-value = 0.0468)
(**) no significant differences at 1% between manufacturing and trade (p-value = 0.0173) or between manufacturing and services (p-value = 0,0305)

The results show no significant differences in the wealth allocated to remunerate third-party capital (financing agents) between the manufacturing, trade, service, and insurance sectors. However, as expected, the banking sector presented a significantly lower percentage because, as already mentioned, expenses with financial intermediation are taken into account in the creation and non-distribution of wealth.

Regarding own capital, banks and insurance companies distributed an average annual percentage significantly higher than the other branches to remunerate partners and shareholders. Thus, the results indicate no significant differences in the wealth distribution by the manufacturing, trade, service, banking, and insurance sectors, though banks and insurance companies allocated higher amounts of wealth to remunerate personnel and shareholders. The manufacturing, trade, insurance, and services sectors allocated a significant portion of wealth to the government and to remunerate third-party capital.

5. Final Considerations

This study aimed to verify the extent to which the distribution of wealth generated by the largest publicly held and private companies operating in Brazil (from the main branches of economic activity) differs in terms of the tax burden, remuneration of capital (own and third parties) and employees, from 1999 to 2018.

The analysis of the sample addressed in this study revealed real growth of the total wealth generated by the largest companies operating in Brazil for the five branches of economic activity; on average, the manufacturing sector was the most representative over the 20 years analyzed here. The service sector was the second most important, with both sectors accounting for 73.8% of the total wealth generated in the period. Most of the wealth generated by the manufacturing, trade, and service branches from 1999 to 2018 was allocated to the government. During this period, the banking sector allocated most of its wealth to remunerate employees in the form of salaries, fees, and benefits, and insurance companies allocated the highest portion to remunerate shareholders in the form of dividends and retained profits.

The results revealed significant differences in the distribution of wealth to the government; the trade and service branches distributed the largest portion of the wealth they generated to the government (followed by the manufacturing sector). In turn, the banking and insurance branches enjoyed the lowest taxation proportionally to the wealth generated in their activities.

As for personnel remuneration, banks distributed an average annual percentage of wealth significantly higher than the remaining sectors to remunerate employees. Although insurance companies distributed an average annual percentage of wealth significantly lower than banks, due to a smaller number of employees, they distributed an average amount of wealth per employee higher than the manufacturing, trade, and service sectors.

The results indicate no significant differences in wealth distribution between the manufacturing, trade, service, and insurance sectors to remunerate third-party capital. The low figure of 3.4% for banks is a consequence of how the cost of financial intermediation is classified, considering that these institutions consider such a cost in the net creation of wealth, not in its distribution. Hence, financial institutions can allocate a larger portion of wealth to the government, personnel, and shareholders. However, the results show that employees and shareholders were privileged to the detriment of the government.

Regarding own capital remuneration, banks and insurance companies distributed a significantly higher average annual wealth than the other branches to remunerate shareholders, indicating that a significant portion of the wealth these two branches generated was distributed to partners and shareholders.

Thus, the results reveal significant differences in the distribution of the wealth generated by the main branches of the economy (i.e., manufacturing, trade, services, financial institutions, and insurance companies) to employees, shareholders, and creditors. The same result was found in the proportion of wealth distributed to the government through taxes, revealing a considerable imbalance in the distribution of the sectors' wealth. Note that the manufacturing, trade, and services branches bore a much higher tax burden than banks and insurance companies over the 20 years analyzed, negatively impacting the amount these three branches distributed to employees and shareholders compared to banks and insurance companies.

These findings corroborate the results reported by Santos & Hashimoto (2003) and Cunha, Ribeiro & Santos (2005), showing that the productive sectors deal with a tax burden significantly higher than banks and insurance companies. Additionally, they allocate a portion significantly smaller than banks and insurance companies to remunerate shareholders. The results also corroborate those obtained by Koprowski et al. (2020) while differing from those reported by Santos, Cunha, De Luca & Ribeiro (2013) as they show no relevant changes in tax policies due to the different presidential terms.

Note that these results cannot be generalized because a non-probabilistic sample was adopted in this study. Additionally, the analysis considered the companies grouped according to their respective branches of economic activity. Thus, future studies might analyze the different industries composing the manufacturing, trade, and service sectors, for instance, consumer goods, steel, and metallurgy industries; wholesale and retail trading companies, agricultural products; and transport, telecommunications, and energy service companies, to identify differences related to the activities conducted by these companies.

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Guidelines for Authors

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To submit articles to the *Journal of Education and Research in Accounting* – REPeC authors should follow the standards and criteria set by REPeC. From January 2013, the guidelines of the American Psychological Association (APA) with regard to citations and references should be followed. Submissions not complying with the standards will be rejected.

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Articles may be written in Portuguese, English, with at least 5,000 and maximum 9,000 words, including tables, figures, notes and references. A maximum of 5 (five) authors are allowed per article. All papers accepted will be translated and published in two languages: Portuguese and English.

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

Do not use expressions like id., ibid., op. cit., loc. cit. and the like, or reference notes and footnotes. Notes at the end of the text are acceptable, but should be avoided.

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- An **abstract** written in the language of origin of the article (Portuguese or English) with at least 150 and at most 200 words, single space between lines, in four paragraphs containing the following elements, highlighted: **Objective, Method, Results and Contributions**. At the end of the abstract should be placed **three to five** keywords;

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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  - A4 paper (210 x 297 mm);
  - Times New Roman, size 12;
  - Spacing: single;
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  - Tables and figures in Times New Roman, size 10;
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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.

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

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Table editor	Word for Windows 97 or superior. In case authors have drawn their tables in Microsoft Excel or in a similar program, please remake the tables using the feature in Word
Font	Times New Roman, size 10
Line spacing	Simple
Spacing before and after paragraphs	3 pt
Table colors	Use only black and white (grayscale)
Title	The table title must be brief, clear and explanatory. It should be placed above the table, in the top left corner, and on the next line, just below the word Table (with a capital initial), followed by the number that designates it. The tables are presented with Arabic numerals in sequence and within the text as a whole. Eg: Table 1, Table 2, Table 3, and so on
Citation of tables	When citing tables in the text, type only the number referring to the table, for example Table 1, Table 2, Table 3 and so on. (the word 'Table' should be presented with the first letter capitalized). Never write 'table below', 'table above' or 'table on page XX' because the page numbers of the article may change while formatting
Table notes	The font used in the notes of the table should be Times New Roman, size 10, single spaced. The notes should be described in the footnote of the table, and they serve to indicate the Source of the information of the table, and other information important to understanding the table

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The figure should show a flow chart, a chart, a photograph, a drawing or any other illustration or textual representation.

The figure should be displayed with its information visible and adequate for its understanding, and should be formatted as follows:

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Figure colors	Use only black and white (grayscale)
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Title	It explains the figure concisely, but discursively. The title should be placed under the figure and numbered with Arabic numerals in sequence, preceded by the word Figure (with initial capital). Eg: Figure 1, Figure 2, Figure 3, etc. After the title, any other information necessary for clarification of the figure or source must be added as a note
Captions	The caption is the explanation of the symbols used in the figure and must be placed within the limits of the figure
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