ISSN 1981-8610

English version

repec

Revista de Educação e Pesquisa em Contabilidade

Journal of Education and Research in Accounting

REPeC, Brasília, v. 17, n. 2, Abr./Jun. 2023
Available online at www.repec.org.br
DOI: http://dx.doi.org/10.17524/repec.v17i2

ABRACICON
ACADEMIA BRASILEIRA
DE CIÊNCIAS CONTÁBEIS

repec

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

ISSN 1981-8610

Quarterly journal, digital and free published by Brazilian Academy of Science in Accounting (Abracicon)

This journal offers immediate, free access to its content from the internet through SEER system, therefore, scientific knowledge is freely available to the public, aimed at a democracy of knowledge.

REPeC uses the Journal Electronic Editing System (SEER) for management of the periodical.

The Electronic Editing System (SEER) was translated and adapted from the Open Journal Systems (OJS) by the Brazilian Institute of Information in Science and Technology (IBICT). This free software, developed by the British Columbia University from Canada, aims at assisting scientific journals editing in each stage of the process, from submission and consultants evaluation to online publication and its indexation.

Available online at: *http://www.repec.org.br*

Academia Brasileira de Ciências Contábeis (Abracicon)
SAS, Qd. 5, Bl. J, 4º andar, Ed. CFC, CEP: 70070-920, Brasília-DF
E-mail: *repec@cfc.org.br*

REPeC: Journal of Education and Research in Accounting [eletrônic issue] / Brazilian Academy of Science in Accounting – v.1, n.1 (dec. 2006 /mar. 2007)-. -- Brasília: CFC, 2007-.

Quarterly
ISSN: 1981-8610
Access Mode: http://www.repec.org.br

1. Accounting Sciences 2. Accounting I. Federal Council of Accounting II. Title.

CDU-657

Catalographic Label prepared by Librarian Lúcia Helena Alves de Figueiredo CRB 1/1.401

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, Editor's Word, p. 115-116, Apr./Jun. 2023 | ISSN 1981-8610

Editor's Word

Dear readers, we are delivering the second issue of 2023. I want to inform and congratulate the papers published in this issue and thank all the authors who submitted their manuscripts but, unfortunately, were not approved.

The first paper invited was written by Paulo Henrique Amaral Rody and José Elias Feres de Almeida. It presents a systematic and bibliometric literature review addressing grammatical violations in financial statements and their effects on the capital market. According to previous studies, the conceptual basis is that the violation of grammatical rules is associated with the quality of financial statements. This study discusses potential directions in accounting research on the subject, which is strongly developed in the United States but seldom explored in Brazil and other countries. Finally, the analyses suggest that the structure in which data are provided to the market may be a restriction factor preventing the broader application of this proxy.

Renan Silva de Carvalho, Joyce Menezes da Fonseca Tonin, and Simone Letícia Rimundini Shanches wrote the second paper in this issue. Its objective was to analyze how research using the textual analysis approach to predict stock returns in the capital market has developed. The results gather evidence that textual sentiment can predict stock returns and is captured from several sources of information. Four categories emerged from the analysis, which correspond to the sources of information when the textual analysis is performed: financial news (31), corporate disclosures (29), social media (16), and other documents (8).

The third paper, by Mirian Mara Batista da Silva, Luiz Ernani de Carvalho Junior, and Eduardo Mendes do Nascimento, investigates whether the level of tax practices changes the probability of financial distress among organizations. The variable Generally Accepted Accounting Principles, Effective Tax Rate (GAAP ETR) was found to positively and significantly influence the response variable. At the same time, Book-Tax Differences (BTD) and Deferred ETR (DIF ETR) negatively and significantly affect the probability of financial distress to occur among the analyzed companies, suggesting that the less a company engages in tax-reducing activities, the higher the likelihood of financial distress.

The fourth paper was written by Rayane Vieira Rodrigues, Gabriela Boechat, Heloisa Coli, and Marco Antonio Carvalho Teixeira. It aimed to analyze the active transparency of state and federal public ministries, using a sample of institutional websites and transparency portals for analysis purposes. The results show a high level of compliance with the Law on Access to Information (LAI) provisions, mainly related to budgetary issues. The Public Prosecution Offices do not fully comply with most of the National Council of the Public Prosecution (CNMP) specifications and resolutions though. When they do comply, open data are not available.

The fifth paper, written by João Victor Lucas and Flaviano Costa, aimed to compare the differences in the perception of Academic Justice and Machiavellianism among graduate students in the Business field, according to their sociodemographic characteristics. The survey revealed significant differences in the perception of Academic Justice between genders, indicating a lower perception of justice among women. When analyzing the regions, the students attending programs in the Northeast, North, and Midwest presented a lower perception of academic justice. Additionally, younger students tend to show a more prevalent Machiavellianism trait, while accounting students distrust others more frequently than the remaining Business students.

The sixth article was written by Laissa Gama Vieira, Bruno Meirelles Salotti, and Raquel Wille Sarquis and aimed to analyze the quality of explanatory notes concerning the transition to IFRS 15 in Brazil by comparing the estimated effects in 2017 with those effectively reported in 2018. Additionally, o Índice *da Qualidade das Notas Explicativas (IQNE)* [Explanatory Note Quality Index] was developed, and the main impacts are described. More than half of the companies just reclassified their accounts for better presentation, increased the disclosure of explanatory notes, or experienced no effect due to the IFRS 15 entering into force. Although, in general, the new standard did not generate significant impacts for most companies, some sectors were significantly affected, such as public utilities, communication, non-cyclical stocks, industrial goods, and civil construction. Ultimately, the companies disclosed good-quality information in the transition notes, considering that 45% of the sample obtained the highest score in the IQNE.

Finally, I emphasize that, as shown in its objectives, REPeC is not a publication linked to education only, as it encompasses several fields, such as financial, managerial, public, tax, and audit, among others.

Without further ado, I would like to thank our invaluable referees and all the researchers who submitted their papers to REPeC. Congratulations to those who had their papers approved. The demand is fairly high, and the road to the final publication is arduous.

Thank you once again. I hope you enjoy this new issue.

Academic greetings.

Gerlando Lima, Ph.D.
Editor in Chief.

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, art. 1, p. 117-139, Apr./Jun. 2023 | DOI: http://dx.doi.org/10.17524/repec.v17i2.3289 | ISSN 1981-8610

Systematic Literature Review and Bibliometric Analysis of Grammatical Violations in Financial Reports

Paulo Henrique Amaral Rody
https://orcid.org/0000-0001-9786-8049

José Elias Feres de Almeida
https://orcid.org/0000-0001-5220-0598

Abstract

Objective: This study presents a systematic literature review and bibliometric analysis of grammatical violations in financial statements and their effects on the capital market. Similar to previous studies, the conceptual framework concerns the violation of grammatical norms associated with the quality of financial statements.

Method: The method included two alternative and complementary paths: i) a systematic review in which the grammatical violation proxy is presented as a valuable tool to measure the quality of accounting information by analyzing the texts of explanatory notes of financial statements, and ii) a bibliometric analysis based on the journals listed in Web of Science, and Bibliometrix, an R-Tool for mapping analysis.

Results and Contributions: The in-depth literature analysis through a systematic review and a comprehensive analysis performed via bibliometrics allow this study to serve as a conceptual framework for future research. There are discussions on the potential directions of accounting research on the subject, which is strongly developed in the United States, but little explored in Brazil and other countries. Finally, the analysis suggests that the framework through which data become available to the market might restrict the application of this proxy.

Keywords: Grammatical Violations; Bibliometrix; Quality of Accounting Information; Comprehensibility; Bibliometrics.

Published in Portuguese and English. Original Version in Portuguese.

Received in 3/16/2023. Accepted on 4/10/2023 by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 6/30/2023.
Organization responsible for the journal: Abracicon

1. Introduction

Financial statements provide a framework for companies to disclose accounting information, discussions, and explanations about the numbers reported, besides analyses that explain variations in results and balance sheets. However, the growing complexity of applying the principles of recognition, measurement, and disclosure of accounting standards and the textual language accompanying financial statements led to questions about the quality and ability of such disclosures to establish communication between a company and its investors and creditors.

Many researchers and users of financial statements argue that the increasing textual complexity of such disclosures makes it difficult for companies to bring any item to the attention of investors. Empirical evidence suggests that professional and non-professional investors cannot accurately interpret the most complex information in financial statements. Additionally, such complexity reduces efficiency when interpreting accounting information, increasing uncertainty (Gkikas, Tzafilkou, Theodoridis, Garmpis, Gkikas, 2022).

The corporate environment is affected by information asymmetry and agency problems between investors, entrepreneurs, and managers (Wang et al., 2021; Bourveau & Schoenfeld, 2017; Beyer, Cohen, Lys, Walther, 2010; Haniffa & Cooke, 2005). Information asymmetry might lead to distortions in the interpretation of financial statements. Hence, faced with incomplete or inaccurate information, external users may incur misinterpretations, undermining credibility due to the low quality of information (Scheld, Stolper, Walter, 2021; Elfeky, 2017). For Chung, Goh, Ng, and Yong (2017), the quality of financial information ensures that investors can rely upon such information. Therefore, mechanisms intended to reduce information asymmetry and improve the quality of accounting information become relevant.

While there is a substantial amount of research in the field of finance focusing on quantitative data, qualitative elements related to textual disclosure are seldom explored (Dyer, Lang, Lawrence, 2017). Among studies focusing on textual analysis in the finance field, Buehlmaier and Whited (2018) point out that measures of financial constraints using textual analysis of annual results efficiently capture the companies' volume of shares and debt. Along these lines, Hoberg and Maksimovic (2015) consider that restriction measures based on textual analysis affect companies with high cash flow levels. The textual analysis of financial statements enables one to predict a company's future cash flows (Frankel, Jennings, Lee, 2016). As highlighted by Borges and Rech (2019), evidence from Brazilian studies on textual analysis indicates that the textual quality of financial statements improves communication between companies and investors. Therefore, it is relevant to investigate mechanisms and new proxies capable of improving the quality of Brazilian financial information, benefiting society, companies, and investors.

Investors in the capital market need relevant, complete, and good-quality information. The disclosure of financial information that meets the needs of investors becomes essential for an efficient investment decision-making process. Therefore, the companies, which centralize such information, may adopt different disclosure strategies that may increase or decrease the transparency of information. Hence, conflicts of interest are expected to arise, considering that some companies may choose to disclose only part of the information or present low-quality information to investors, undermining the decision-making process. However, regardless of a company's strategy, a point seldom explored concerns the textual quality of what is disclosed. This new perspective may capture another nuance of financial statements' quality.

In this study's systematic review, Grammatical Violation (GV) is presented as a proxy capable of measuring the quality of financial information through a textual analysis of companies' standardized financial statements or specifically analyzing management reports, explanatory notes, or other structured reports containing texts released by companies. For example, a low level of GV would suggest high financial information quality, and accurately interpreting textual accounting information decreases the risk of uncertainty in decision-making, favoring investors' confidence in their investments (Gillette & Pundrich, 2020).

Research focusing on the textual analysis of financial statements contributes to understanding communication between companies and accounting information users (Borges & Rech, 2019). Li (2008) confirms this statement by showing that the linguistic characteristics of financial statements affect the companies' performance. The literature presents the effects and consequences of the textual portion of financial statements, and such evidence can help companies improve their disclosure process.

It is in this context that Grammatical Violation (GV) is inserted. It originates from linguistics, which focuses on the quality of texts, i.e., the fewer grammatical violations, the better the quality and credibility of information (Gillette & Pundrich, 2020; Campbell, Loumioti, Moerman, 2019). Gillette and Pundrich (2020) are considered precursors as they incorporated GV in financial accounting. They investigated whether GV is a timely indication of the quality and reliability of financial information, shedding light on the relationship between qualitative and quantitative aspects of corporate communication. Furthermore, this textual analysis metric differs from others, such as the Gunning fog and Flesch-Kincaid indices, widely used in the accounting literature.

GV is defined as the presence of errors related to the standard norm of a language, such as punctuation, syntax, and spelling mistakes, among others (Gillette & Pundrich, 2020; Hucks, 2015; Ghose & Ipeirotis, 2010). Few studies address the GV theme in the accounting and finance field in the Brazilian literature, configuring a gap. Hence, further research is needed on the quality of accounting information, considering the GV level of financial information as a proxy among Brazilian companies. This systematic review can serve as a conceptual basis and theoretical support for future studies. It will present directions in accounting research on this topic, which is still seldom explored in Brazil and several other countries. Most evidence comes from the United States, as researchers can access several reports and structured financial information sources, allowing automated processing (e.g., algorithm) and textual analysis tools.

Thus, this study presents a systematic literature review and a bibliometric analysis, building a theoretical framework to lay down the paths for future studies that will bring new evidence to the field of accounting sciences. Therefore, it has been established that low levels of grammatical violation suggest a greater quality of financial statements, decreasing information asymmetry and favoring better capital allocation.

In such an environment, investors need a mechanism capable of reducing information asymmetry between a company and its investors to make efficient decisions about the potential capital contribution in a company. Thus, the proxy developed in previous studies on the grammatical violation (GV) can be used to complement or add to previous studies addressing earnings quality, such as, for example, the quality of accruals, earnings management, and conservatism, among others. In addition, this GV proxy has practical effects on the market, considering that companies could process their reports periodically to reduce the risk of disclosing financial statements with grammatical errors.

This systematic literature review and bibliometric analysis on Grammatical Violation (GV) in financial statements signal to companies, to the market in general, and, mainly, to investors that the quality of accounting information, indirectly obtained through the level of GV, can be used strategically, as an indicator of reliable information and credibility. Therefore, this aspect allows investors to make more accurate decisions and constitutes another means for reducing information asymmetry. In addition, publicly traded companies can benefit from the technology used in GV algorithms to improve the quality of all sorts of accounting reports.

The following sections were organized into (2) grammatical violation and financial information quality; (3) grammatical violation in financial statements; (4) grammatical violation: systematic literature review; (5) grammatical violation: literature bibliometrics; and (6) final considerations.

2. Grammatical violations and the quality of financial information

2.1 Textual Analysis of Accounting Information

Changes in accounting standards impacted the process of preparing financial statements, considerably increasing the volume of reports companies must present to external users. Consequently, companies face challenges in disclosing information about their businesses in a clear and informative manner (Wang, Brabenec, Gao, Tang, 2021). Lehavy, Feng, and Merkley (2011) corroborate such a statement. The increase in the amount of disclosure required, coupled with the difficult task of disclosing business transactions to investors, has led to concerns about the quality of disclosure and the ability of external users to make sound decisions based on such information.

Accounting information plays two essential roles in market economies. First, it allows investors to assess the return potential of investment opportunities (*ex-ante*), and second, it enables investors to monitor the use of the capital invested (*ex-post*) (Beyer et al., 2010). These roles suggest that the quality of financial information affects the investors' decision-making. Hence, information must be well-written and comprehensible to facilitate users' understanding. In this context, the financial information in narrative texts is relevant to the stock market because investors use it in decision-making (Izco, Cabestre, Olalla, 2021). A similar analysis conducted by Silva and Fernandes (2009) indicates that Brazilian companies report fewer material facts about economic and financial performance in addition to more-difficulty-to-read accounting reports. However, comprehensibility is an essential quality of the information presented in financial statements so that users instantly and adequately assimilate it, whether from a corporate (Helms, Holscher, Nelde, Schneider, 2021) or an environmental perspective (Voigt, Machado, Meurer, 2020).

Companies operating in the capital market must disclose their information to investors in a more attractive and explanatory manner. In this sense, Gao, Lin, and Sias (2018) state that the level of reliability of financial information is a relevant aspect of interest to researchers, companies, and investors. Thus, research in the accounting and finance field focuses on verifying whether the qualitative attributes of corporate disclosure affect the decision-making of investors and information intermediaries.

Companies operating in a highly competitive global stock market should adopt strategies to maximize economic and financial performance to gain a competitive advantage over competitors (Alipour, 2019; Bonsall, Leone, Miller, Rennekamp, 2017). The international literature suggests that this competitiveness also applies to the Brazilian stock market, as companies disclose different amounts of financial information with varying quality levels. In such a context, information asymmetry decreases trust and increases the risk to which investors are exposed (Sethuraman, 2019; Li, 2017).

Next, Table 1 describes the topics that are trending in articles on textual analysis in the field of accounting in the international literature.

Table 1
Tendencies in Textual Analysis

Tendencies in Textual Analysis	Authorship
Relationship between behavioral aspects of language and employee performance.	Erickson, Holderness, and Thornock, 2022.
Influence of linguistic characteristics on information quality and content of accounting reports.	Brown, Crowley, and Elliott, 2020.
Analysis of style characteristics for disclosing accounting information and their relationship with investors' interpretation.	Grant, Hodge, and Sinha, 2018.
Relationship between textual characteristics and probability of earnings management.	Kim & Zhou, 2017.
Companies that have a higher level of earnings management in a given year and accounting reports with a lower degree of readability.	Lo, Ramos, and Rogo, 2017.
Translation of international accounting standards and practical problems of linguistic equivalence within the institutional context of IFRS.	Kettunen, 2017.
International accounting standards applied in countries with different languages can cause dialectical inconsistencies and impair the quality of accounting information.	Doupnik & Richter, 2003.

Source: Developed by the authors.

Table 1 presents the topics addressed in the articles, showing a need for studies to develop this line of research, i.e., the textual analysis of accounting information considering grammatical violations.

3. Grammatical violations in financial statements

Previous studies applying content and textual analysis in the accounting field started a new front of research interpreting texts, graphs, and words, among other elements extracted from financial statements or complementary reports, mainly because such evidence is still incipient and inconclusive (Souza & Borba, 2022). This portion of the literature processed analyses manually or with little automation until data processing advanced, and algorithms and systems allowed the automated analysis of the explanations provided in financial statements (Efretuei, Usoro, Koutra, 2021).

Recently, studies such as Gkikas et al. (2022) presented evidence that texts processed by algorithms capture, to some extent, helpful information for users, as they are associated with the price of assets traded on stock exchanges. In other words, it is possible to quantify, via analysis tools using machine learning, the quality of texts disclosed to external users and, thus, understand the impact of this factor on investors.

A text is a relevant tool for transmitting information between users; texts written with higher quality can significantly influence investors' decision-making, especially in a context with high information asymmetry (Si, Jiang, Fang, Usman, 2020). Being able to understand a text, despite its grammatical mistakes, directly depends on what is being read and the context in which information is transmitted (Williams, 1981). The transmission of information through writing texts creates an efficient communication network between the author and readers (Helms et al., 2021).

Nascimento and Henz (2021) consider that building knowledge of written language involves understanding and reflecting on textual production as an element constituted by norms. A set of skills is needed to produce a text, such as spelling accuracy, the proper use of ideas, words, phrases, grammar, and punctuation, besides assessment and revision (Brandenburg, 2015; Galbraith & Stillman, 2006). All this knowledge serves to generate texts that readers are capable of understanding entirely. However, errors may occur in this process and jeopardize the accurate interpretation of the meaning intended.

The main reasons justifying grammatical violations in Brazilian texts include factors such as the complexity of the spelling system, lack of knowledge of grammatical norms, stagnation of the writing learning process, lack of reading, and inattention. These factors lead to agreement, accent marks, and spelling errors, impairing the quality of a text (Nascimento & Henz, 2021).

Using correctly written texts that obey grammatical and spelling rules may indicate the user's personality characteristics and behavioral aspects, which become a relevant source of information for companies. Regardless of whether a lack of knowledge or negligence causes mistakes, they may have negative consequences for companies (Scott, Sinclair, Short, Bruce, 2014). In the context of accounting information quality, users may use the textual quality of financial statements as a parameter to assess the quality of financial information a company reports. For Hucks (2015), the characteristics of a text used in financial statements provide a significant indication of the quality of information. In this context, the GV level of financial information configures evidence of the quality of accounting information.

For Hucks (2015), grammatical violations indicate potential future default, longer financing terms, higher default rates, and lower yields for creditors. In such a context, GV is related to the debtor's credibility by assessing the textual quality a company presents to creditors. Therefore, companies with a high level of GV may incur increased costs due to the low quality of financial statements. Especially in the capital market context, grammatical violations are a relevant source of information for reducing information asymmetry, which becomes even more latent when the level of asymmetry is high and reliable information is limited (Shore, Tashchian, Forrester, 2021).

GV is defined as the presence of violations of a language's standard norm, such as errors in punctuation, syntax, spelling, and agreement, among others (Gillette & Pundrich, 2020). Grammatical and spelling errors affect how readers interpret texts (Kreiner, Schnakenberg, Green, Costello, Mcclin, 2002), hindering understanding and affecting the judgment of those analyzing a text (Shore et al., 2021). In this sense, one's educational level is a significant indicator of the probability of making such mistakes. Therefore, people with more years of schooling are less likely to make spelling mistakes than those with fewer years of schooling. Such a difference in educational level impacts the authors' behavioral differences (Hargittai, 2006).

For Gubala, Larson, and Melonçon (2020), the quality of redaction affects the business environment; companies tend to accept texts that comply with grammatical and spelling standards better. Assessing the quality of accounting information through the GV proxy is consistent because the GV level conveys information about the competence, awareness, and limitations of text information. This notion can be extended to the business environment as grammatical violations in financial statements reveal how reliable reports are and provide cues on the quality of financial statements.

GV levels may influence a company's sales volume. A higher level of GV is negatively associated with sales, compared to a lower level of GV, which tends to positively affect the volume of sales (Ghose & Ipeirotis, 2010). Therefore, the disclosure of financial statements must be timely and accurate to allow a more precise interpretation and, consequently, efficient decision-making for internal and external users (Silva & Fernandes, 2009).

Readers consider grammatically correct texts (without GV) more comprehensible (Liu, Wei, Gao, 2022). Hence, this evidence highlights the need to adopt correct redaction in texts, showing the importance of textual quality and its role in users' behavior (Queen & Boland, 2015). Furthermore, according to Boland and Queen (2016) and Everard and Galletta (2005), spelling mistakes give readers a negative impression of the competence of the individual who wrote the text and his/her attention to detail.

In line with the grammatical quality of a text, Gao et al. (2018) examined how writing style is associated with creditor behavior. They found that more aggressive creditors are more likely to grant financing, and at lower rates, to clients whose redaction is more comprehensible. In addition, customers with more comprehensible writing are less likely to default; hence, the quality of the textual writing facilitates obtaining financing.

Thus, verifying the level of GV in financial statements enables identifying evidence on the accuracy of the financial information in reports and serves as a new, more practical investigation method for measuring the quality of financial information (Gillette & Pundrich, 2020). Therefore, the assumption is that grammatical violations provide cues about financial statements' quality, as they correlate with the time, effort, and resources dedicated to preparing these reports.

4. Grammatical Violations: A Systematic Literature Review

A Systematic Literature Review and Bibliometric Analysis were used to identify the characteristics of Brazilian and international literature on Grammatical Violation (GV). The objective was for these tools to complement each other, broadening information on results. The methodological procedures of the two tools are described in the sections below (4.1 and 5.1, respectively).

The main difference between these tools is the step concerning variable parameterization. In the Systematic Literature Review, the researcher can specifically define the characteristics s/he wants to look for in the articles selected, whereas, in a Bibliometric Analysis, the parameters to identify the characteristics of articles are established in advance and cannot be manipulated.

4.1 Methodological Procedures

A Systematic Literature Review was performed to improve the quality of the theoretical foundation on the GV theme. It consists of reviewing the literature in a planned, structured, and controlled manner to identify the primary authors, relevant publications, and trends throughout time and highlight research gaps (Marioka, Iritani, Ometto, Carvalho, 2018).

Eligibility criteria were adopted to conduct the Systematic Literature Review to ensure a replicable and transparent procedure (Moher, Liberati, Tetslaff, Altman, 2009). Accordingly, the following criteria were established:

1. **Inclusion criteria**: (a) empirical studies addressing topics on the level of grammatical violation of financial information; (b) articles from the fields of finance, business, linguistics, and psychology; and (c) preferably, articles published in A1, A2, A3, A4, and B1 of Qualis Capes 2016.
2. **Exclusion criteria**: (a) articles in fields outside the scope of this study; (b) articles not addressing the topic of this study; and (c) studies not complying with the standard structure of peer-reviewed articles (Introduction, Theoretical Framework, Methodology, Results, and Conclusion).
3. **Identification and Selection**: The articles were identified and selected by reading titles, abstracts, and keywords.
4. **Time frame**: No time frame was established to select articles.
5. **Language**: articles written in Portuguese, English, or Spanish.
6. **Publication status**: peer-reviewed scientific articles.
7. **Search criteria**: Queries were made to electronic databases, and we also searched the studies cited by the articles selected.
8. **Search descriptors**: The words and/or expressions used to search for the articles were based on a consultation of the articles' abstracts and keywords related to this study's objective. Hence, synonyms were used to expand the scope and quality of the search for articles of interest for each subject.
9. **Databases**: The search was conducted in 4 databases: Periodical Portal of Capes, Web of Science, Scopus, and ranking of the 50 journals used by the Financial Times Research.

4.2 Literature Systematic Review

The results of the Systematic Literature Review on GV are described below, according to the database (Tables 2 to 5) and total general and total per language (Tables 6 and 7, respectively).

4.2.1 Periodical Portal of Capes

Descriptors: *violação gramatical* [grammatical violation]*; erro gramatical* [grammatical error]*; erro de ortografia* [misspelling]*; erro ortográfico* [orthographic mistake]*; erro de escrita*[writing error]*; erro escrito* [written error]*; qualidade do texto* [text quality]*; qualidade textual* [textual quality], and *mineração de texto* [text mining]. The filters "contain" and "in the title" were used.

Table 2
Papers on Grammatical Violation – Capes

Descriptor	Number of Articles
Violação gramatical	0
Qualidade textual	0
Erro gramatical	1
Erro de ortografia	1
Erro ortográfico	1
Erro de escrita	1
Erro escrito	0
Mineração de texto	1
Qualidade do texto	3
Total	8

Source: Developed by the authors.

4.2.2 Web of Science

Descriptors: grammatical violation; grammatical error; spelling errors, spelling mistakes; orthographic error; writing error; text quality; textual quality, and text mining. The filters "contain"; "no subject" were used.

Table 3
Papers on Grammatical Violation - Web of Science

Descriptor	Number of Articles
Grammatical violation	2
Grammatical error	7
Spelling errors	1
Spelling mistakes	1
Orthographic error	1
Writing error	0
Text quality	0
Text mining	0
Total	12

Source: Developed by the authors.

4.2.3 Scopus

Descriptors: grammatical violation; grammatical error; spelling errors, spelling mistakes; spelling error; writing error; text quality; textual quality, and text mining. The filters "contain" and "in the title" were used.

Table 4

Papers on Grammatical Violation – Scopus

Descriptor	Number of Articles
Grammatical violation	0
Grammatical error	5
Spelling errors	1
Spelling mistakes	0
Orthographic error	0
Writing error	2
Text quality	3
Text mining	2
Total	13

Source: Developed by the authors.

4.2.4 Financial Times Top 50 journals

Descriptors: grammatical violation; grammatical error; spelling errors, spelling mistakes; orthographic error; writing error; text quality; textual quality e text mining.

Open search – no filter parameterization.

Table 5

Articles on Grammatical Violation – Financial Times

Journal	Number of Articles
3. Accounting, Organizations and Society	5
4. Administrative Science Quarterly	1
12. Information Systems Research	2
13. Journal of Accounting and Economics	1
14. Journal of Accounting Research	3
43. Review of Accounting Studies	1
46. Review of Financial Studies	1
48. Strategic Entrepreneurship Journal	3
50. The Accounting Review	1
Total	18

Hyperlink: Link with the complete ranking

Source: Developed by the authors based on the Financial Times Top journals containing articles on the topic.

Table 5 describes the journal ranking. Of the 50 journals, only 9 contained articles addressing GV; the remaining 82% did not contain articles on GV. The complete ranking of journals is accessed through the link at the end of Table 5.

Table 6
Articles on Grammatical Violation – Financial Times

Descriptor	Number of Articles
Grammatical violation	6
Grammatical error	12
Spelling errors	0
Spelling mistakes	0
Orthographic error	0
Writing error	0
Text quality	0
Text mining	0
Total	18

Source: Developed by the authors.

4.2.5 Summary of the Systematic Literature Review

Table 7 presents the general total of articles and according to the database, and general total of articles and according to language.

Table 7
Articles on Grammatical Violation – Total

Database	Number of Articles
CAPES Periodicals	8
Web of Science	12
Scopus	13
Financial Times	18
Portuguese	12
Spanish	11
English	28
Total	51

Source: Developed by the authors.

The Systematic Literature Review revealed only three studies addressing GV in financial accounting in the international literature: Gillette and Pundrich (2020), Hucks (2015), and Ghose and Ipeirotis (2010). Furthermore, no articles addressing this topic were found in the Brazilian literature.

4.3 The Development of Textual Analysis Metrics

One of the most critical methodological limitations of research on the textual analysis of financial statements is that studies are restricted to very small samples. Such limitation usually occurs due to a difficulty in data processing, which, in most studies, is done manually. For example, Tennyson, Ingram, and Dugan (1990) examined the relationship between financial constraint and textual narrative with a sample of only 23 companies. Therefore, studies on textual analysis using automated data collection can contribute to developing textual analysis metrics as it enables the analysis of more extensive samples.

Among the articles found in the Systematic Literature Review, section 4.3.1 analyzes the three studies in the international literature addressing GV in the accounting field; no Brazilian studies were found. The following articles were analyzed: Ghose and Ipeirotis (2010), Hucks (2015), and Gillette and Pundrich (2020).

4.3.1 Textual Review and Economic Aspects – Ghose and Ipeirotis (2010)

The study focused on the impact of textual reviews on the economic results of product sales. It verified how different textual factors, such as perceived usefulness, interfere with social results. Various aspects of texts, such as subjectivity levels, readability measures, spelling measures, and grammatical errors, were explored and used to identify relevant aspects based on textual analyses.

Different levels of textual characteristics were also analyzed, such as the average utility of reviews and identity text measures. The econometric analysis showed that the degrees of subjectivity, informativeness, readability, and linguistic correction of the texts are relevant aspects that might affect a company's sales volume and also perceptions concerning the usefulness of the products sold.

The search's main results show that non-objective and subjective phrases are negatively associated with the volume of product sales compared to more objective and less subjective phrases; i.e., users deem objective and non-subjective phrases to be more informative and valuable.

Finally, this study highlights that it is possible to accurately predict the impact of textual analysis on the volume of product sales and perceived usefulness by analyzing the relative importance of three categories of textual resources: the resources of the textual sender, subjectivity text resources, and textual readability feature. This article is the first to integrate econometrics into the textual analysis of grammatical and spelling aspects to estimate the economic impact of textual aspects.

4.3.2 Textual Review and the Obtaining of Loans – Hucks (2015)

The study mentioned above verified whether the textual characteristics of loan applicants would reveal the issuer's behavioral aspects. The author analyzed whether the spelling and grammatical quality of those applying for a bank loan (the debtor) affects the decisions of companies granting loans (lenders). The authors consider that spelling errors probably do not represent a strategic choice, and this textual deficiency may impair communication between creditors and debtors.

The study revealed that spelling errors directly and negatively affect the lenders' decisions regarding capital allocation and that such errors also predict adverse outcomes for lenders, such as the incidence of high default rates and decreased rates of return. Consistent with this finding, misspellings in borrowers' loan application reports also predict the outcome of lenders' risk analysis; i.e., the more spelling errors in a text, the higher the interest rates on loans granted and the greater the difficulty in obtaining a loan.

The author also pointed out that the presence of spelling errors in loan applications is a sign of the borrowers' low level of financial capacity, and this aspect is used in the creditors' decision-making, decreasing the chances of borrowers obtaining a loan. Thus, borrowers may intentionally provide more readable texts with fewer grammatical errors to increase their chances of obtaining loans.

Thus, the study previously mentioned directly contributes to textual analysis in disseminating information in the credit market literature, establishing that the characteristics of textual language provide an essential cue about the quality of texts, the applicant's financial capacity, and the likelihood of obtaining loans.

4.3.3 Textual Review and Quality of Information – Gillette and Pundrich (2020)

The study above analyzed whether grammatical violations, including the number of typographical, syntax, punctuation, spelling, and other similar errors present in annual financial statements, provide a timely indication of the quality of financial reports. To the extent that grammatical violations capture the time, effort, and resources devoted to preparing financial records, the authors predicted that grammatical violations are correlated with the quality of accounting information.

This hypothesis was validated through the analysis of financial statements, which revealed that grammatical violations are negatively correlated with empirical metrics of the quality of a company's internal relationship with the information environment, the time companies have to file their financial statements, and how closely a company monitors the process of generating these accounting reports.

Consistent with this prediction, the authors above showed that grammatical violations positively correlate with the likelihood of reformulating accounting reports. In general, the study identified that grammatical violations might provide a timely indication of the quality of financial statements, in their qualitative and quantitative aspects, improving the disclosure process between companies and external users.

The authors claim that the users of financial statements depend on cues suggesting the quality of accounting reports to make investment, loan, or service contracting decisions. Consequently, studies focused on textual analysis can contribute to advancing this line of research on the quality of accounting information, especially considering the relevance of the quality of the texts in these reports.

The results suggest that grammatical violations can be used as an indicator of the quality of accounting reports within the context of disclosures of accounting information. Consequently, grammatical violations might provide a valuable measure of the reliability of accounting information in various forms of corporate communication, such as management forecasts and press releases.

The above article, which is the most recent in this line of research (2020), reports findings relevant to investors, researchers, regulators, and other users of financial statements and served as the basis for preparing this systematic literature review, intended to generate a theoretical framework for the construction of future empirical research on the influence of grammatical violations in Brazilian financial statements. The article also released several appendices on Python automation scripts for the data collection process.

5. Grammatical violations: literature's bibliometrics

5.1 Methodological Procedures

This section presents a bibliometric analysis intended to map and quantify the state of the art of the Grammatical Violation topic in the international and Brazilian literature. Section 4 presented several databases, and the current section presents a bibliometric analysis in the Web of Science database through the Bibliometrix Library, a package for the R software.

The Bibliometrix tool is open source and was developed by Aria and Cuccurullo (2017) to perform comprehensive analyzes of scientific mapping through bibliometric analyzes that are more consistent with the state of the art. Furthermore, because it is programmed by R software, Bibliometrix is flexible and can be rapidly updated and integrated with other R statistical packages.

The bibliometric analysis technique studies the characteristics of production, dissemination, and use of registered information. Hence, mechanisms using statistical and mathematical methods are intended to measure the scientific production of journals, authors, and other information from the literature (Macias-Chapula, 1998). Araújo (2006) shares this understanding, stating that bibliometrics is a resource that uses statistics and mathematics to map production rates, aspects of the literature, and dissemination of knowledge.

The following descriptors were the criteria used to select articles in the Web of Science database: *violação gramatical* (2 articles) and grammatical violation (344 articles); fields (all); knowledge area (all) and year (all).

5.2 Bibliometric Analysis of the Literature

Based on the sample of articles, the following bibliometric analysis was performed.

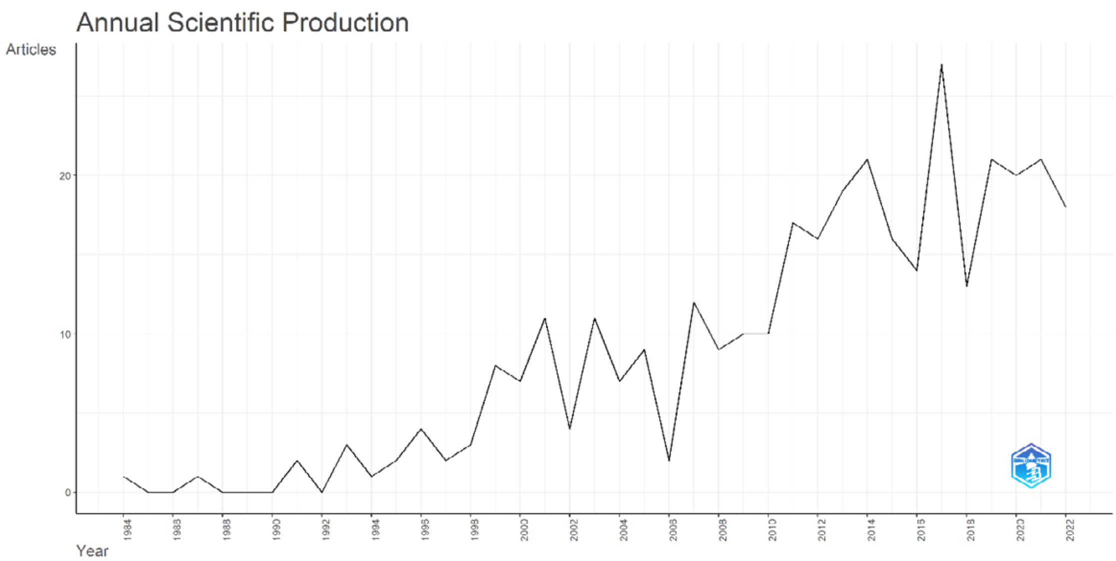


Figure 1. Total of Articles over the years

Source: *Bibliometrix*.

Figure 1 shows the total number of articles per year. The temporal range of the articles was from 1984 to 2022, with a total of 346 articles and 789 authors. The highest number of articles was published in 2017. The graph shows a trend towards increased productivity in the last six years.

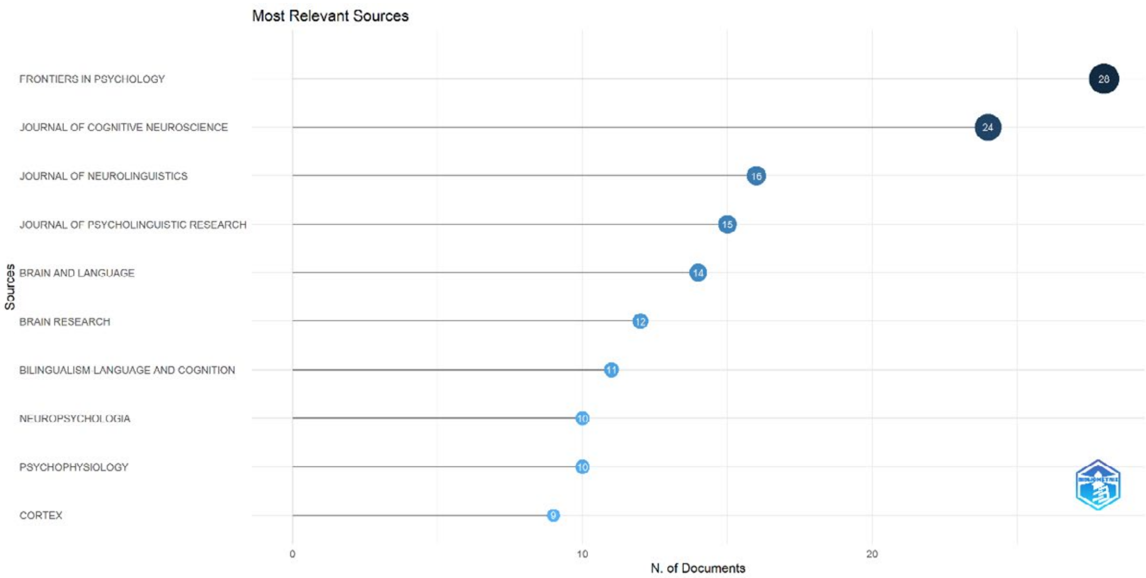


Figure 2. Total Journals

Source: Bibliometrix.

Figure 2 shows the total number of journals. Overall, 97 journals were analyzed; the three most productive journals were: Frontier In Psychology (28 articles), Journal of Cognitive Neuroscience (24 articles), and Journal of Neurolinguistics (16 articles). The other most productive journals were from the Linguistics, Psychology, and Computing fields. No results were found in financial accounting.

Figures 1 and 2 reinforce the notion that, with the increase in computers and servers' data processing capacity and with new tools for textual processing and machine learning, the field began to develop more intensely; there are many opportunities for research and application in the accounting field.

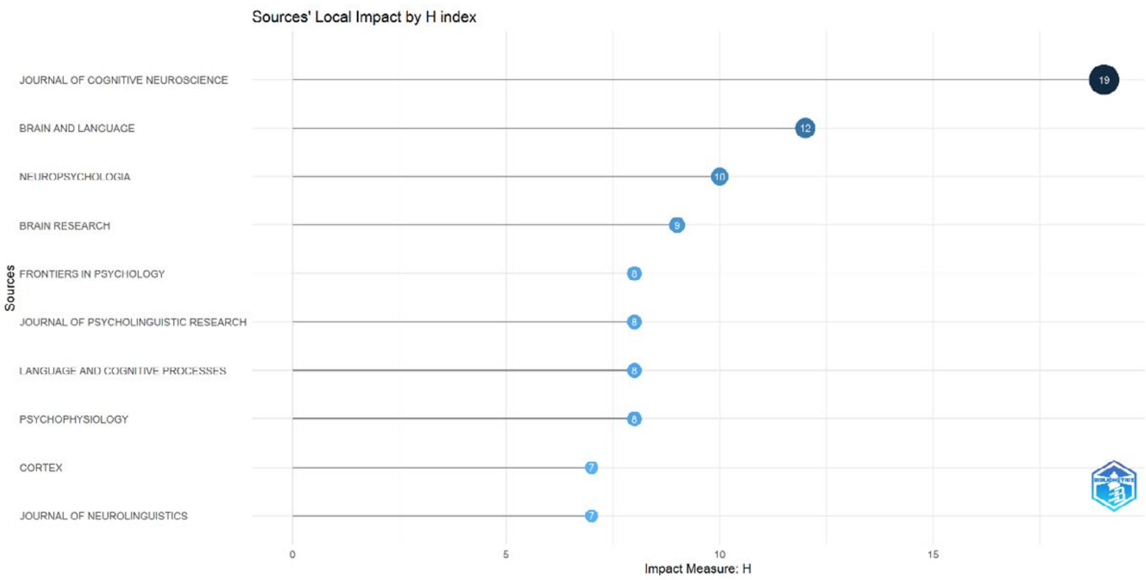


Figure 3. Journals' impact factor

Source: Bibliometrix.

Figure 3 presents the journals' impact factor (H-index); the publication with the highest impact was the Journal of Cognitive Neuroscience.

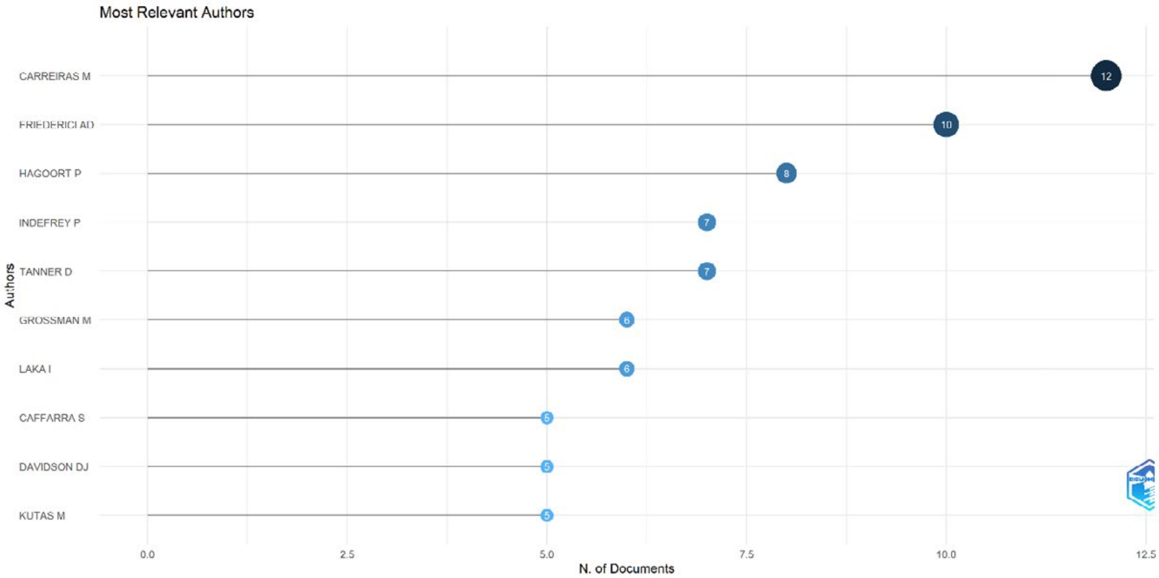


Figure 4. Most relevant authors

Source: Bibliometrix.

Figure 4 presents the most relevant authors. The 3 most productive authors were Carreiras (12 articles), Frederici (10 articles), and Hagdort (8 articles).

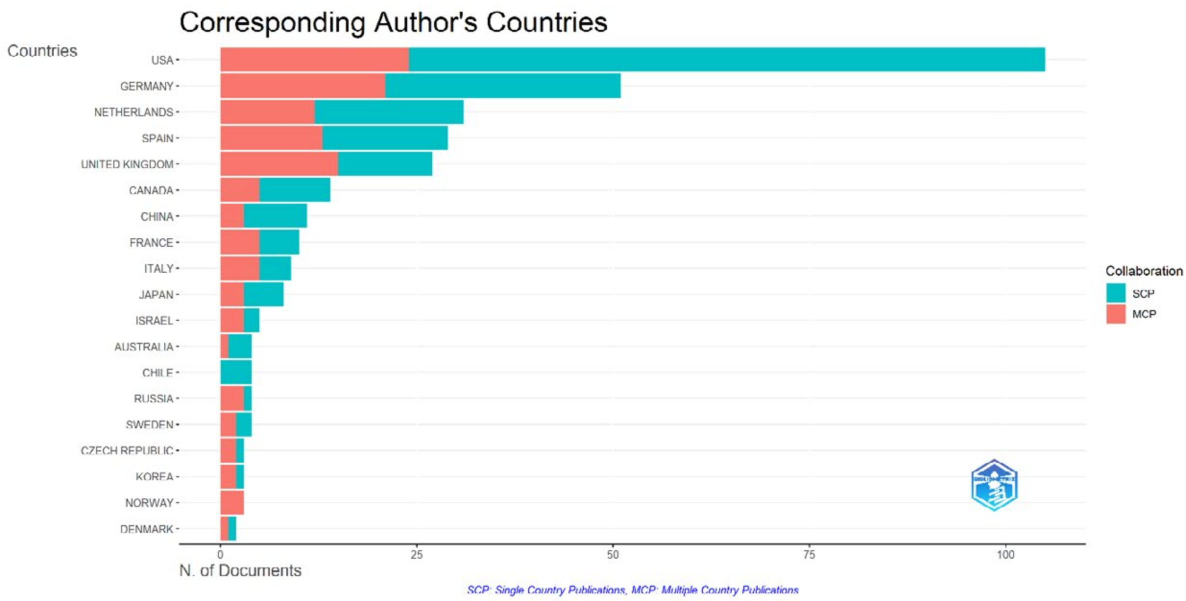


Figure 5. Chart of the most productive countries

Source: Bibliometrix.

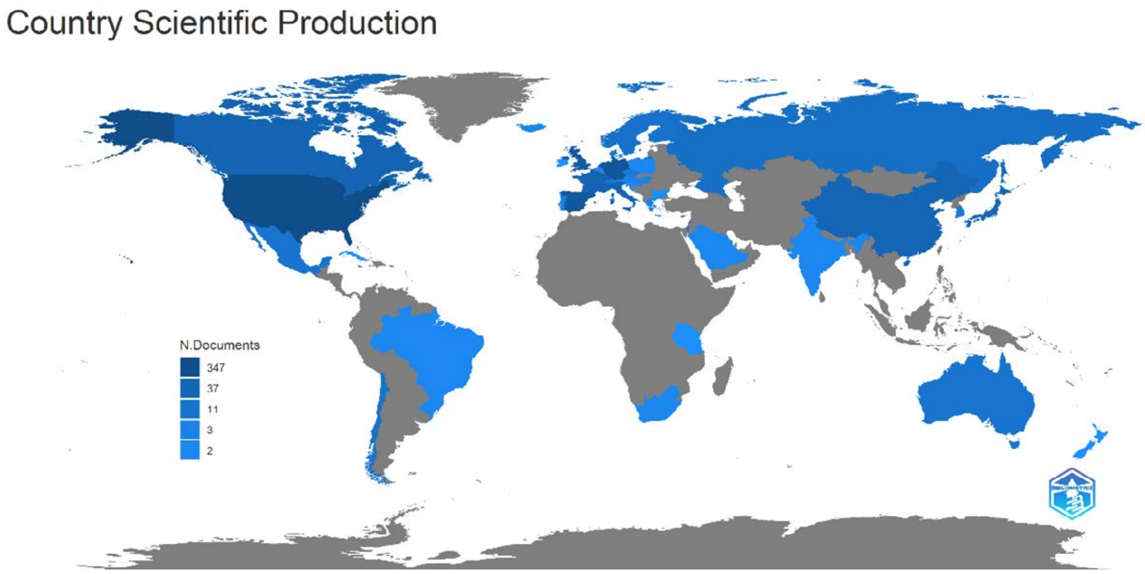


Figure 6. Map of the most productive countries

Source: Bibliometrix.

Figures 5 and 6 present the most productive countries. The United States of America stands out, with 105 articles. Figure 6 depicts countries with high productivity (dark blue color), low productivity (light blue color), and zero productivity (gray color). As shown in the map, Brazil has low productivity, with only two articles, both in the linguistics field.

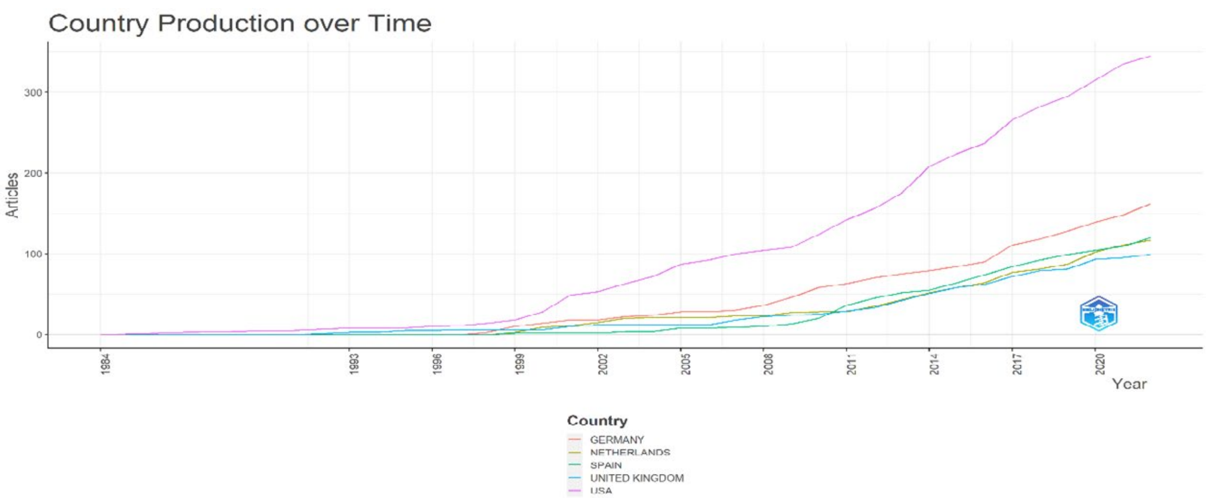


Figure 7. Production of articles per year in each country

Source: Bibliometrix.

Figure 7 presents the articles in each country per year. According to the analysis of the countries' production, from 1984 to 2022, the topic of Grammatical Violation in the international literature has been rising and growing over the last six years.

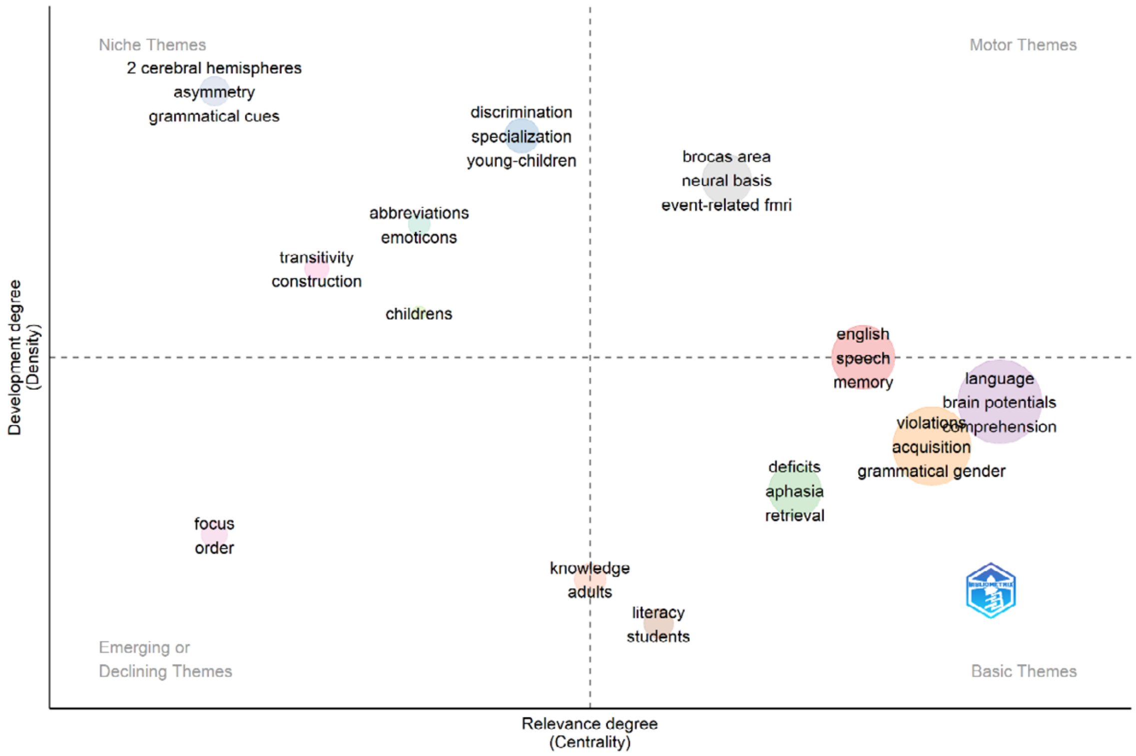


Figure 8. The topics most frequently addressed

Source: Bibliometrix.

Figure 8 presents the topics most frequently addressed in the articles: linguistic comprehension and grammatical vocabulary growth.

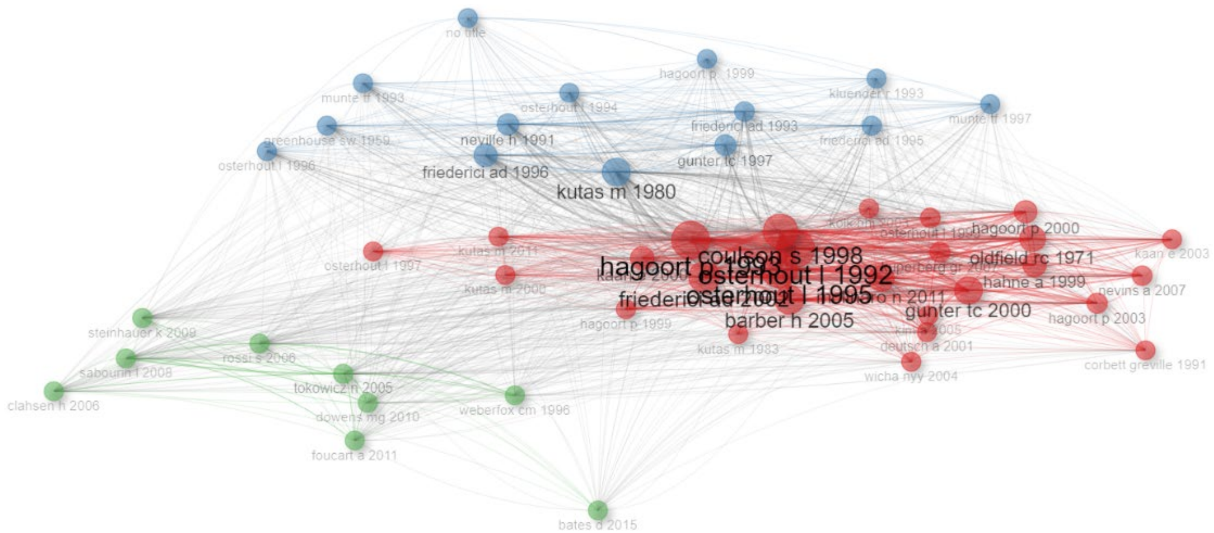


Figure 9. Co-citation Network

Source: Bibliometrix.

Figure 9 describes the co-citation network among the authors of articles on Grammatical Violation. The five most expressive authors in terms of co-citation were: Osterhout (1992), Hagoort (1993), Osterhout (1995), Coulson (1998), and Friederici (2002). Overall, the 50 most relevant authors in the field were highlighted and classified into three groups: strong citation network among authors (red color in the graph), average citation network among authors (blue color in the graph), and low citation network among authors (green color in the graph).

The results of the Systematic Literature Review and the Bibliometric Analysis reveal that researchers should pay attention and develop the topic of Grammatical Violation in Accounting. Future empirical evidence has the potential to fill such a gap in the literature on this topic. For example, studies can explore the quality of companies' accounting information through the analysis of Grammatical Violations, even if indirectly, to generate empirical data, which are still incipient, collaborating with the development of the topic and creating other opportunities for future research.

6. Final considerations

In this study, Grammatical Violation (GV) was presented as a proxy to indirectly measure the quality of financial information, decreasing information asymmetry and minimizing conflicts of interest between companies and investors. In this context, low levels of grammatical violation suggest a high degree of financial information quality, which might favor decreased information asymmetry.

Several studies in financial accounting focus on analyzing the role of quantitative variables, such as accounting, financial, and economic indexes, while qualitative aspects are seldom explored. Such a fact highlights a research gap in the international and Brazilian literature, though international studies are advancing. As few studies focus on the qualitative aspects of financial information, investigating the mechanisms capable of measuring the quality of financial information via the textual qualitative aspects of financial statements is a relevant contribution to financial accounting.

For this reason, this study is expected to be helpful when addressing a textual analysis variable originating from the linguistics field within financial accounting. Note that fewer grammatical violations indicate that a company has a higher level of financial information quality, increasing the credibility of information.

This study also signals companies, the market in general, and, mainly, investors that the quality of accounting information verified through the GV level of financial information can be used strategically to indicate reliable information and credibility. Analyses based on such a proxy can support investors' more accurate decisions and decrease information asymmetry. Thus, these aspects are relevant for publicly held companies, which can internally validate the quality of their financial statements produced by departments that establish relationships with investors and communicate with the market.

This Systematic Literature Review and Bibliometric Analysis can serve as a theoretical framework for creating a GV proxy for the Brazilian accounting field. In this context, economic and financial factors that affect the level of grammatical violation in financial statements disclosed by Brazilian companies can be analyzed. This study is the first to analyze this topic in Brazil; hence, future studies are suggested to address grammatical violations in financial information, providing empirical evidence of a subject still incipient in international literature, particularly in Brazilian literature.

References

Alipour, M., Ghanbari, M., Jamshidinavid, B., & Taherabadi, A. (2019). The relationship between environmental disclosure quality and earnings quality: a panel study of an emerging market. *Journal of Asia Business Studies, 13*(2), 326-347. https://doi.org/10.1108/JABS-03-2018-0084

Araújo, C. A. (2006). Bibliometria: evolução histórica e questões atuais. *Em questão*, *12*(1), 11-32. https://seer.ufrgs.br/index.php/EmQuestao/article/view/16

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of informetrics, 11(4), 959-975. https://doi.org/10.1016/j.joi.2017.08.007

Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of accounting and economics*, *50*(2-3), 296-343. https://doi.org/10.1016/j.jacceco.2010.10.003

Boland, J. E., & Queen, R. (2016). If you're house is still available, send me an email: Personality influences reactions to written errors in email messages. *PloS one*, *11*(3), 1-17. https://doi.org/10.1371/journal.pone.0149885

Bonsall, S. B., Leone, A. J., Miller, B. P., & Rennekamp, K. (2017). A plain English measure of financial reporting readability. *Journal of Accounting and Economics*, *63*(2-3), 329-357. https://doi.org/10.1016/j.jacceco.2017.03.002

Borges, G., & Rech, I. J. (2019). Determinantes da legibilidade das notas explicativas de companhias brasileiras. *Revista de Gestão, Finanças e Contabilidade*, *9*(3), 31-51. https://doi.org/10.18028/rgfc.v9i3.7522

Bourveau, T., & Schoenfeld, J. (2017). Shareholder activism and voluntary disclosure. *Review of Accounting Studies*, *22*(3), 1307-1339. https://doi.org/10.1007/s11142-017-9408-0

Brandenburg, L. C. (2015). Testing the recognition and perception of errors in context. *Business and Professional Communication Quarterly*, *78*(1), 74-93. https://doi.org/10.1177/2329490614563570

Brown, N. C., Crowley, R. M., & Elliott, W. B. (2020). What are you saying? Using topic to detect financial misreporting. *Journal of Accounting Research*, *58*(1), 237-291. https://doi.org/10.1111/1475-679X.12294

Buehlmaier, M. M., & Whited, T. M. (2018). Are financial constraints priced? Evidence from textual analysis. *The Review of Financial Studies*, *31*(7), 2693-2728. https://www.jstor.org/stable/48615517

Campbell, D., Loumioti, M., & Wittenberg-Moerman, R. (2019). Making sense of soft information: Interpretation bias and loan quality. *Journal of Accounting and Economics*, *68*(2-3), 18-110. https://doi.org/10.1016/j.jacceco.2019.101240

Chung, S. G., Goh, B. W., Ng, J., & Yong, K. O. (2017). Voluntary fair value disclosures beyond SFAS 157's three-level estimates. *Review of accounting studies*, *22*(1), 430-468. https://doi.org/10.1007/s11142-016-9384-9

Doupnik, T. S., & Richter, M. (2003). Interpretation of uncertainty expressions: a cross-national study. *Accounting, Organizations and Society*, *28*(1), 15-35. https://doi.org/10.1016/S0361-3682(02)00010-7

Dyer, T., Lang, M., & Stice-Lawrence, L. (2017). The evolution of 10-K textual disclosure: Evidence from Latent Dirichlet Allocation. *Journal of Accounting and Economics*, *64*(2-3), 221-245. https://doi.org/10.1016/j.jacceco.2017.07.002

Elfeky, M. I. (2017). The extent of voluntary disclosure and its determinants in emerging markets: Evidence from Egypt. *The Journal of Finance and Data Science*, *3*(1-4), 45-59. https://doi.org/10.1016/j.jfds.2017.09.005

Erickson, D., Holderness Jr, D. K., Olsen, K. J., & Thornock, T. A. (2022). Feedback with feeling? How emotional language in feedback affects individual performance. *Accounting, Organizations and Society*, *99*, 101329. https://doi.org/10.1016/j.aos.2021.101329

Everard, A., & Galletta, D. F. (2005). How presentation flaws affect perceived site quality, trust, and intention to purchase from an online store. *Journal of Management Information systems*, *22*(3), 56-95. https://doi.org/10.2753/MIS0742-1222220303

Frankel, R., Jennings, J., & Lee, J. (2016). Using unstructured and qualitative disclosures to explain accruals. *Journal of Accounting and Economics*, *62*(2-3), 209-227. https://doi.org/10.1016/j.jacceco.2016.07.003

Galbraith, P., & Stillman, G. (2006). A framework for identifying student blockages during transitions in the modelling process. *ZDM*, *38*(2), 143-162. https://doi.org/10.1007/BF02655886

Gao, Q., Lin, M., & Sias, R. W. (2018). Words matter: The role of texts in online credit markets. *Journal of Financial and Quantitative Analysis, forthcoming*, 01-58. https://dx.doi.org/10.2139/ssrn.2446114

Ghose, A., & Ipeirotis, P. G. (2010). Estimating the helpfulness and economic impact of product reviews: Mining text and reviewer characteristics. *IEEE transactions on knowledge and data engineering*, *23*(10), 1498-1512. https://doi.org/10.1109/TKDE.2010.188

Gillette, J., & Pundrich, G. (2020). Grammatical Violations and Financial Reporting Quality. *Available at SSRN 3496434*. https://dx.doi.org/10.2139/ssrn.3496434

Gomes, A. C., de Macedo, H. C., & da Costa Marques, J. A. V. (2018). Efeitos da estrutura de capital sobre o gerenciamento de resultados contábeis no mercado brasileiro de capitais. *Sistemas & Gestão*, *13*(4), 469-481. https://doi.org/10.20985/1980-5160.2018.v13n4.1411

Gkikas, D. C., Tzafilkou, K., Theodoridis, P. K., Garmpis, A., & Gkikas, M. C. (2022). How do text characteristics impact user engagement in social media posts: Modeling content readability, length, and hashtags number in Facebook. *International Journal of Information Management Data Insights*, *2*(1), 1-9. https://doi.org/10.1016/j.jjimei.2022.100067

Grant, S. M., Hodge, F. D., & Sinha, R. K. (2018). How disclosure medium affects investor reactions to CEO bragging, modesty, and humblebragging. *Accounting, Organizations and Society*, *68*, 118-134. https://doi.org/10.1016/j.aos.2018.03.006

Gubala, C., Larson, K., & Melonçon, L. (2020). Do writing errors bother professionals? An analysis of the most bothersome errors and how the writer's ethos is affected. *Journal of Business and Technical Communication*, *34*(3), 250-286. https://doi.org/10.1177/1050651920910205

Haniffa, R. M., & Cooke, T. E. (2005). The impact of culture and governance on corporate social reporting. *Journal of Accounting and Public Policy*, *24*(5), 391-430. https://doi.org/10.1016/j.jaccpubpol.2005.06.001

Hargittai, E. (2006). Hurdles to information seeking: Spelling and typographical mistakes during users' online behavior. *Journal of the Association for Information Systems*, *7*(1), 1-16. https://doi.org/10.17705/1jais.00076

Helms, N., Hölscher, R., Nelde, M., & Schneider, J. (2021). The quality of risk reports: Integrating requirement levels of standard setters into text analysis. *Journal of Corporate Accounting & Finance*, *32*(3), 7-23. https://doi.org/10.1002/jcaf.22494

Hoberg, G., & Maksimovic, V. (2015). Redefining financial constraints: A text-based analysis. *The Review of Financial Studies*, *28*(5), 1312-1352. https://doi.org/10.1093/rfs/hhu089

Hucks, R. J. (2015). *Voluntary Involuntary Disclosure*. Unpublished Doctoral Thesis, Doctor of Philosophy (Business Administration), Universidade de Michigan. Ann Arbor, Estados Unidos da América.

Izco, M. Á., Cabestre, R. F. J., & Olalla, R. C. (2021). Readabilty in management reports: extension and good governance practices: La legibilidad en los informes de gestión: extensión y buenas prácticas de gobierno corporativo. *Revista de Contabilidad-Spanish Accounting Review*, *24*(1), 19-30. https://doi.org/10.6018/rcsar.363171

Kettunen, J. (2017). Interlingual translation of the International Financial Reporting Standards as institutional work. *Accounting, Organizations and Society*, *56*, 38-54. https://doi.org/10.1016/j.aos.2016.10.001

Kim, J., Kim, Y., & Zhou, J. (2017). Languages and earnings management. *Journal of Accounting and Economics*, *63*(2-3), 288-306. https://doi.org/10.1016/j.jacceco.2017.04.001

Kreiner, D. S., Schnakenberg, S. D., Green, A. G., Costello, M. J., & McClin, A. F. (2002). Effects of spelling errors on the perception of writers. *The Journal of general psychology*, *129*(1), 5-17. https://doi.org/10.1080/00221300209602029

Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, *86*(3), 1087-1115. https://doi.org/10.2308/accr.00000043

Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and economics*, *45*(2-3), 221-247. https://doi.org/10.1016/j.jacceco.2008.02.003

Li, Y. (2017). Voluntary disclosure and investment in environmental technology. *Journal of Economic Behavior & Organization*, *133*, 331-341. https://doi.org/10.1016/j.jebo.2016.11.002

Liu, S., Wei, K., & Gao, B. (2022). Power of information transparency: How online reviews change the effect of agglomeration density on firm revenue. *Decision Support Systems, 153*, 1-13. https://doi.org/10.1016/j.dss.2021.113681

Lo, K., Ramos, F., & Rogo, R. (2017). Earnings management and annual report readability. *Journal of accounting and Economics*, *63*(1), 1-25. https://doi.org/10.1016/j.jacceco.2016.09.002

Macias-Chapula, C. A. (1998). O papel da informetria e da cienciometria e sua perspectiva nacional e internacional. *Ciência da informação*, *27*(2), 134-140. https://doi.org/10.18225/ci.inf.v27i2.794

Morioka, S. N., Iritani, D. R., Ometto, A. R., & Carvalho, M. M. D. (2018). Revisão sistemática da literatura sobre medição de desempenho de sustentabilidade corporativa: uma discussão sobre contribuições e lacunas. *Gestão & Produção*, *25*, 284-303. https://doi.org/10.1590/0104-530X2720-18

Moher, D., Liberati, A., Tetslaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *Annals of Internal Medicine*, 151(4), 264-269. https://doi.org/10.1136/bmj.b2535

Nascimento, J. F., & Henz, R. R. (2021). A ortografia e os níveis de escrita: o erro em textos de sujeitos escolarizados. *Confluência: Revista do Instituto de Língua Portuguesa*, (61), 226-248. https://doi.org/10.18364/rc.2021n61.399

Queen, R., & Boland, J. E. (2015). I think your going to like me: Exploring the role of errors in email messages on assessments of potential housemates. *Linguistics Vanguard*, *1*(1), 283-293. https://doi.org/10.1515/lingvan-2015-0011

Scheld, D., Stolper, O., & Walter, A. (2021). Double Dutch finally fixed? A large-scale investigation into the readability of mandatory financial product information. *Journal of Consumer Policy*, *44*(2), 151-178. https://doi.org/10.1007/s10603-021-09486-0

Sethuraman, M. (2019). The effect of reputation shocks to rating agencies on corporate disclosures. *The Accounting Review, 94*(1), 299-326. https://doi.org/10.2308/accr-52114

Scott, G. G., Sinclair, J., Short, E., & Bruce, G. (2014). It's not what you say, it's how you say it: language use on Facebook impacts employability but not attractiveness. *Cyberpsychology, Behavior, and Social Networking*, *17*(8), 562-566. https://psycnet.apa.org/doi/10.1089/cyber.2013.0584

Si, H., Jiang, S., Fang, Y., & Usman, M. (2020). Can readability of loan description affect loan success rate and loan cost?: A textual analysis of P2P loan description. *Engineering Economics*, *31*(3), 302-313. http://dx.doi.org/10.5755/j01.ee.31.3.25760

Silva, C. A. T., & Fernandes, J. L. T. (2009). Legibilidade dos fatos relevantes no Brasil. *Revista de Administração Contemporânea-RAC Electronica*, *3*(1), 142-159. https://doi.org/10.58969/25947125.1.1.2017.16

Shore, T., Tashchian, A., & Forrester, W. R. (2021). The influence of resume quality and ethnicity cues on employment decisions. *Journal of Business Economics and Management*, *22*(1), 61-76. https://doi.org/10.3846/jbem.2020.13670

Tennyson, B. M., Ingram, R. W., & Dugan, M. T. (1990). Assessing the information content of narrative disclosures in explaining bankruptcy. *Journal of Business Finance & Accounting*, *17*(3), 391-410. https://doi.org/10.1111/j.1468-5957.1990.tb01193.x

Voigt, F. H., Machado, J. V., & Meurer, A. M. (2020). Nível de evidenciação de custos e investimentos ambientais e legibilidade dos relatórios da administração de empresas do setor de papel e celulose. *Revista Mineira de Contabilidade*, *21*(3), 51-62. https://doi.org/10.51320/rmc.v21i3.1171

Wang, C., Brabenec, T., Gao, P., & Tang, Z. (2021). The Business Strategy, Competitive Advantage and Financial Strategy: A Perspective from Corporate Maturity Mismatched Investment. *Journal of Competitiveness*, *13*(1), 164-181. https://doi.org/10.7441/joc.2021.01.10

Williams, J. M. (1981). The phenomenology of error. *College composition and communication*, *32*(2), 152-168. https://doi.org/10.2307/356689

repec
Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting
ABRACICON

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, art. 2, p. 140-160, Apr./Jun. 2023 | DOI: http://dx.doi.org/10.17524/repec.v17i2.3111 | ISSN 1981-8610

Stock Return Predictability based on Textual Sentiment Analysis: a review

Renan Silva de Carvalho
https://orcid.org/0000-0001-5475-3233

Joyce Menezes da Fonseca Tonin
https://orcid.org/0000-0003-1371-1314

Simone Leticia Raimundini Sanches
https://orcid.org/0000-0002-7363-2573

Abstract

Objective: To analyze how research addressing textual analysis as a tool to predict the return on stocks in the capital market has evolved.
Method: Systematic literature review supported by the VosViewer software; 78 empirical studies written in English and indexed in the Web of Science were analyzed.
Results: The results show evidence that textual sentiment can predict the return on stocks and be captured from varied sources of information. Four categories emerged from the analysis corresponding to sources of information for textual analysis: financial news (31), corporate disclosures (29), social media (16), and other documents (8).
Contributions: This paper contributes to the academic milieu by showing the main findings of studies on the topic and suggesting topics for future research. In a practical context, it presents to investors evidence that textual information provided by companies may also cause reactions in the market.

Keywords: Textual Analysis; Textual Sentiment; Return on Shares; Systematic Literature Review.

Published in Portuguese and English. Original Version in Portuguese.

Round 1: Received in 5/25/2022. Review requested on 11/22/2022. Round 2: Resubmited on 12/21/2022. Review requested on 2/3/2023. Round 3: Resubmited on 3/4/2023. Accepted on 5/1st/2023 by Vinícius Gomes Martins, PhD (Editor assistant) and by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 6/30/2023. Organization responsible for the journal: Abracicon

1. Introduction

The Efficient Market Hypothesis (EMH) predicts that the prices of financial assets reflect all the content of disclosed relevant information (Fama, 1970). Despite existing criticisms of this theory, such as Kahneman (1994) and Lo (2004), it is assumed that the market is, at least, partially efficient (Markiel, 2003). One of the potential reasons concerns the large volume of information disclosed in corporate reports, press releases, and the news, making it difficult to manually and thoroughly analyze such information (Xing, 2017).

In this sense, it is in the interest of investors to seek ways to automate this information analysis process, considering that they are not able to absorb all relevant information as rationality is limited (Kahneman, 1994); automating this process would enable investors to acquire some level of competitive advantage. However, much of the information disclosed is qualitative, which, at first, would make it difficult to analyze without individual attention. In this context, textual analysis emerges. As noted by Loughran and McDonald (2016), it allows extracting the sentiment of information disclosed, transforming it into quantitative data, which can be treated to, among other things, predict changes in the prices of shares.

Studies seeking to trace the relationship between textual sentiment or tone and stock returns found evidence that a change in the textual tone of annual reports significantly influences variations in stock prices over a two-day window after the disclosure (Feldman, Govindaraj, Livnat, & Segal, 2010); the linguistic tone of conference calls on results is a significant indicator of abnormal returns and subsequent trading volume (Price, Doran, Peterson, & Bliss, 2012); and high levels of uncertainty in the texts of forms filed with the Securities and Exchange Commission (SEC) before an Initial Public Offering (IPO) process, have higher returns on the first day of trading on the stock exchange (Loughran & MacDonald, 2013).

In addition to the companies' financial disclosures, the literature presents textual analyses to capture news and social media sentiment. Tetlock's (2007) findings reveal that high levels of pessimistic words in the Wall Street Journal lead to lower returns in the market the next day. Likewise, Chen, De, Hu, and Hwang (2014) show that a textual analysis of investors' opinions transmitted through social media can predict the return of companies' shares, as well as profit surprises, which occur when a company reports earnings that are significantly higher or lower than expected.

Given the ample possibility of applying textual analysis in finance and accounting, changing how texts are analyzed with advanced technology shows a need to revisit the literature and organize the main contributions and gaps left, which can be explored in future research. In this sense, Kearney and Liu (2014), Xing (2017), and Loughran and McDonald (2020) conducted reviews on the theme; the latter focused on the use of textual analysis in social media, political bias, and fraud detection.

However, unlike the previous studies, this study specifically explores textual analysis to predict stock returns. That said, the objective here is to analyze how research using the textual analysis approach to predict stock returns in the capital market progressed. A systematic literature review was performed using the VosViewer software, in which 78 empirical papers published in English and indexed in the Web of Science database were analyzed. A starting date was not established for the search, and papers published until the end of 2021 were included.

This review enabled identifying four primary sources of information for textual analysis: financial news (31), corporate disclosures (29), social media (16), and a fourth source, which represents other documents (8). This study contributes to the literature by compiling the main evidence in each category, supporting new research, and indicating potential future directions. Additionally, there are practical contributions by showing stakeholders how qualitative information can affect prices in the market.

In addition to this introduction, this paper presents four other sections. The second section presents the literature review, discussing the efficient market hypothesis, its criticisms, and the emergence of textual analysis in finance; the methodological aspects are presented in the third section; the research results are evidenced in the fourth section; and the fifth and last section contains the final considerations.

2. Theoretical framework

2.1 The Efficient Market Hypothesis, Adaptive Market Hypothesis, and Textual Analysis

Market efficiency is key in the finance literature, as the (un)acceptance of such efficiency determines the development of financial models in the capital market field. The discussion about market efficiency arises with Fama (1970), who presents the Efficient Market Hypothesis (EMH), which assumes that the prices of financial assets reflect all the content of relevant disclosed information.

Fama (1970) separates market efficiency into three types: weak efficiency, semi-strong efficiency, and strong efficiency. Later, Fama (1991) replaces their nomenclatures for the tests: I) return predictability test; II) test for event studies; and III) private information test, respectively. The change in nomenclature did not change the essence of each test; there was only a change in the weak form, which now incorporates the prediction of returns.

An efficient market in its weak form predicts that the stock price completely reflects all past information, especially those referring to asset prices, and according to Fama (1991), the dividend yield and the price/profit ratio. A semi-strong efficient market assumes that prices instantly adjust to other public information, such as annual reports and stock splits, for example. Finally, tests for strong efficiency concern whether individual or group investors can access privileged information relevant to price formation and how this information is incorporated into prices.

After Fama's (1970) study, researchers started challenging the EMH and presented evidence contrary to his theory, showing some market anomalies and questioning the existence of an efficient market. Contrary evidence shows the January effect, in which returns in January are higher than those obtained in other months of the year (Rozeff & Kinney, 1976); the Price/Earnings (P/E) effect, in which stocks with lower P/E would bring higher returns than the market (Ball, 1992); and the obtaining of abnormal returns through the application of moving averages (Brock, Lakonishok, & Lebaron, 1992), among others.

In addition to the anomalies, other theories emerged to explain how the capital market functions. Contrary to one of the main assumptions of the EMH, which is investors' rationality, behavioral finance emerges with Kahneman and Tversky (1979) as precursors. They argue that investors are irrational and that emotions interfere with their decision-making. In this sense, the Adaptive Market Hypothesis (AMH) also opposes the EMH, stating that the market works in cycles and, at times, institutional factors and behavioral aspects change market conditions (Lo, 2004).

Accordingly, Lo (2004) explains that the AMH is based on an approach intended to reconcile the neoclassical structure of the EMH economic interactions with investors' psychological factors, which sometimes result in irrational behavior, consequently affecting the market. From the AMH perspective, there are trends in the market that can generate bubbles, panic, and bullish or bearish cycles, which are phenomena routinely witnessed in natural market ecologies (Lo, 2004).

A practical implication of the AMH is that using investment strategies to obtain above-market returns may work during certain times. However, once the market cycle changes, the strategy may not work as expected and return when conditions become more favorable (Lo, 2004).

Thus, even in a competitive capital market, arbitrage opportunities arise from time to time in an "Adaptive Market." The reason, as Grossman and Stiglitz (1980) point out, is that without these opportunities, there would be no incentive to collect and analyze information and no opportunities in the financial markets, thus causing them to collapse.

One of the assumptions of AMH is that market participants absorb information at different paces (Xing, 2017). Such differences cause certain efficiency deviations that may persist for short periods, allowing additional gains if identified in advance (Markiel, 2003).

Considering the AMH, and given so much information available about companies and the market, investors are interested in streamlining the process of information analysis to take the lead in decision-making and, consequently, obtain returns above the market. Thus, textual analysis emerges, allowing empirical studies that seek, among other possibilities, to verify whether the textual sentiment of public information about the capital market can predict stock price changes (Loughran & McDonald, 2016).

Financial news transmitted by traditional media (journalistic texts) is one of the main objects of textual analysis in the finance literature, which has the seminal work of Tetlock (2007) as one of the precursors. In this same perspective, the growing popularity of social media has created opportunities for investors to share their opinions about publicly traded companies and their market views. Thus, capturing the investors' sentiment through their publications and relating it to stock returns has become a promising field.

Corporate disclosures may also contain information that allows for identifying a company's prospects, and these expectations about future performance are of great interest to investors, who constantly seek to anticipate events. Disclosures that may have their textual content analyzed range from documents provided to regulatory bodies, even before an IPO, to other mandatory disclosures, such as annual reports, or voluntary disclosures, such as earnings conference calls.

3. Methodological procedures

A systematic literature review was chosen because it is a research method that uses the literature as a data source, seeking to synthesize and report evidence on a topic, using search techniques, and systematically organizing data to reduce research bias. Therefore, this research method is in accordance with the objective proposed here.

This study has a qualitative and descriptive approach, as it describes the sample's characteristics and theoretical basis. Additionally, it is classified as a documentary, as data were collected from the literature based on papers selected from a database (Creswell, 2010).

Data were collected through a search on Google Scholar to identify terminologies commonly used in studies on this topic and establish the search terms. The keywords from Price et al. (2012) and Jiang, Lee, Martin, and Zhou (2019) were used in this preliminary search.

Based on the results obtained from Google Scholar on the keywords previously mentioned, those with the highest number of occurrences were selected – one associated with textual analysis and the other associated with market reactions. Hence, the following terms were established: *Textual Analysis* and *Stock Return*, so the papers containing both terms in their titles, abstracts, or keywords were selected.

With the terms in hand, the Web of Science database was chosen to certify that only peer-reviewed papers would be selected (Ahmad & Omar, 2016), besides being a multidisciplinary database considered relevant (Wang & Waltman, 2016).

The search on the Web of Science returned 114 results, including papers published up to the end of 2021; a starting date was not determined for the search. The abstracts of all 114 papers were read, and those presenting an empirical association between textual analysis and the stock return were selected. At this point, 36 papers were excluded for not meeting this criterion. The phases of the systematic review are summarized in Figure 1:

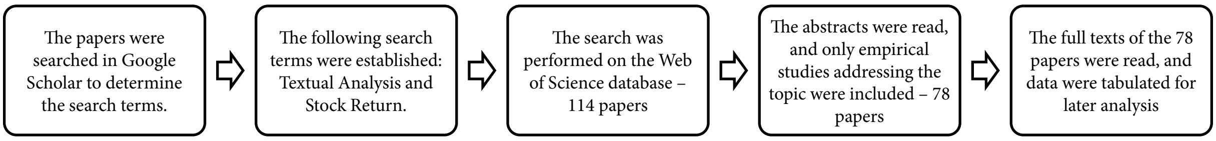


Figure 1. Systematic Review Phases

Source: developed by the author, 2022.

After this filtering process, the final sample comprised 78 papers. Figure 2 shows the progression in the number of publications on the subject over the years.

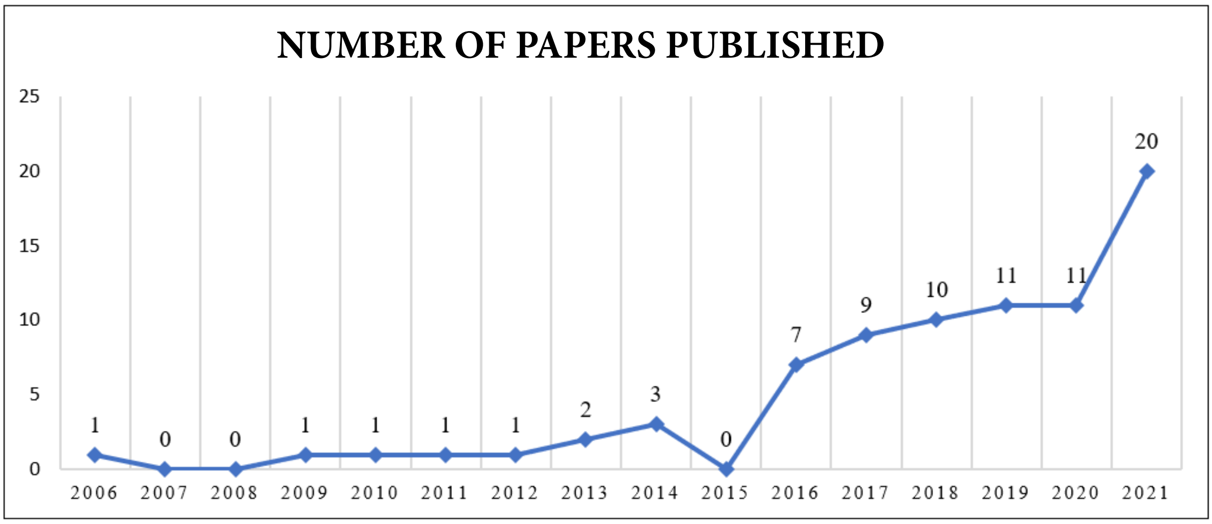


Figure 2. Number of papers published per year

Source: study's data, 2022.

Even before starting the analysis of papers, the tabulation showed a significant growth in the number of studies relating textual sentiment with the return of the shares in 2016; a continuous growth is verified from that year on up to 2020. Another leap in the number of papers on the subject is observed in 2021.

The papers were initially analyzed using the VosViewer® software. This software enabled visualizing a map with the most frequently used keywords and how they are connected, which helped to divide them into categories that represent the sources of information for the textual analysis. The full texts of papers were read to identify the documents in which the textual analysis was performed, i.e., source of information, and allocate the papers into categories.

4. Results and discussions

This section is divided into two main topics. The first presents data such as an overview of the papers, the journals where the papers were published, which countries were investigated, how research evolved over the years, and the methods adopted. The following topic deals with the studies' main contributions and research gaps. Each subtopic represents the documents that were the object of textual analysis in the sample.

4.1 Overview of the Papers Analyzed

The first part of this investigation identified the journals in which the papers were published and the impact factor of each. Table 1 shows a substantial variety of publications on the subject; the 78 papers in the sample were published in 50 different journals in the fields of accounting, finance, administration, and information technology.

Table 1
Periodicals where the papers were published

Periodical	Impact factor	Number of papers	Periodical	Impact factor	Number of papers
Journal of Banking and Finance	3.539	5	ACM Transactions on Information Systems	4.657	1
Journal of Behavioral Finance	1.798	5	Decision Sciences	4.551	1
Review of Financial Studies	8.414	4	Journal of Financial and Quantitative Analysis	4.337	1
Pacific-Basin Finance Journal	3.239	4	The Quarterly Review of Economics and Finance	4.324	1
Management Science	6.172	3	Journal of Corporate Finance	4.249	1
Review of Accounting Studies	4.011	3	Accounting. organizations and society	4.114	1
Applied Economics	1.916	3	Journal of Financial Markets	3.095	1
Journal of Financial Economics	8.238	2	Journal of Financial Research	2.811	1
International Review of Financial Analysis	8.235	2	Journal of Business Finance & Accounting	2.709	1
Knowledge-Based Systems	8.139	2	Multimedia Tools and Applications	2.577	1
Decision Support Systems	6.969	2	Accounting & Finance	2.473	1
International Review of Economics & Finance	3.399	2	Kybernetes	2.352	1
European Financial Management	2.295	2	Financial Analysts Journal	2.345	1
Computational Economics	1.741	2	Amfiteatru Economic	2.304	1

Periodical	Impact factor	Number of papers	Periodical	Impact factor	Number of papers
Journal of Intelligent & Fuzzy Systems	1.737	2	A Journal of Accounting, Finance, and Business Studies	2.060	1
The Quarterly Journal of Economics	15.563	1	Discrete Dynamics in Nature and Society	1.457	1
International Journal of Production Economics	11.251	1	Applied Economics Letters	1.287	1
Finance Research Letters	9.846	1	Revista de Administração de Empresas	1.100	1
Expert Systems with Applications	8.665	1	Lecture Notes in Computer Science	0.402	1
The Journal of Finance	7.870	1	Review of Behavioral Finance	N/A	1
Information Processing & Management	7.466	1	Intelligent Systems in Accounting, Finance and Management	N/A	1
Journal of Business Ethics	6.331	1	Global Business Review	N/A	1
Neural Computing and Applications	5.102	1	Journal of Advanced Computational Intelligence and Intelligent Informatics	N/A	1
Review of Finance	5.059	1	Qualitative Research in Financial Markets	N/A	1
Emerging Markets Finance and Trade	4.859	1	Review of Quantitative Finance and Accounting	N/A	1

Source: study's data, 2022.

Table 2 identifies the environments and markets where the studies were developed.

Table 2
Markets addressed in the papers

Market	No. of papers	Percentage (%)
United States of America	45	57.7
China	13	16.7
World	8	10.3
Taiwan	3	3.8
Germany	2	2.6
Brazil	2	2.6
India	2	2.6
England	1	1.3
Iran	1	1.3
Japan	1	1.3
Total	78	100

Source: study's data. 2022.

Note that the United States is the market most frequently investigated, representing 58% of the papers in the sample, followed by China, with 17%. Additionally, the studies involving emerging markets represent a small portion of the papers, with the possibility of studies conducted in the US being replicated in emerging markets for comparison purposes.

Eight studies were classified under "World," as they refer to studies addressing the market of several countries under different criteria. For example, Glasserman and Mamayski (2019) investigated the top 50 global banks, insurance companies, and real estate by market capitalization, thus covering several countries worldwide. Maragoudakis and Serpanos (2016) analyzed the leading European, Asian, and American stock markets. Furthermore, Anand, Basu, Pathak, and Thampy (2021) focused on the stock indexes of European Union countries.

In the next stage, a map was created in the VosViewer® software with the keywords most frequently used in the 78 studies in the sample (Figure 3) to support the preliminary analysis and identify how the subjects are divided within the topic and how matters have evolved over the years. Hence, the keywords appearing in more than ten studies were included.

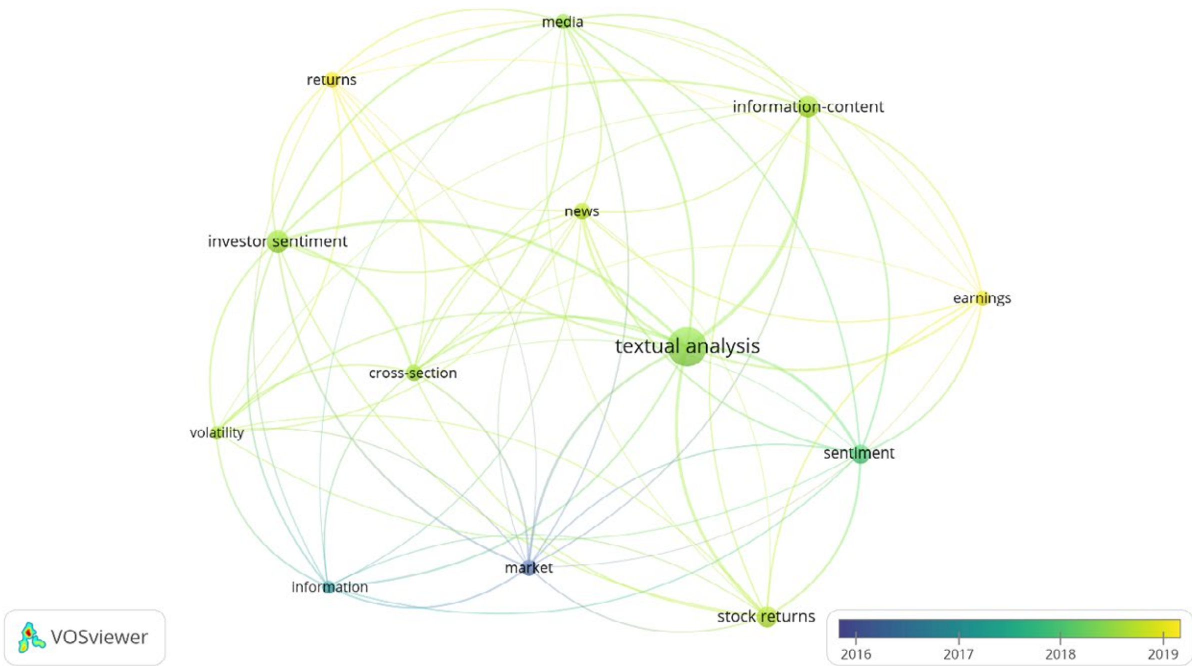


Figure 3. The progression of the papers' keywords

Source: study's data, 2022.

Figure 3 shows that the term "Textual analysis" is near the center of the map and is the keyword most frequently mentioned, with 45 occurrences, in addition to having a connection with all the other words. Note other keywords that also focus on capturing the sentiment of textual information, such as "Sentiment," "Information-content," and "Investor sentiment," in addition to the presence of "Returns," which refers to the return of shares.

There are also some keywords related to the object of textual analysis: "Media," "News," and "Earnings"; the last one refers to the sentiment in the companies' disclosure of the results. However, these words show the different possibilities of applying textual analysis so that the forecast of stock returns is not restricted to corporate documents disclosed by the company but also includes financial news; therefore, investor sentiment on social media might have predictive value.

As for how keywords evolved, most words are in shades of green, meaning they have been well distributed over the years. Among the words that refer to the most recent studies, the word "Earnings" stands out, which suggests that studies published from 2018 onwards focused on analyzing sentiment in the disclosure of results. It is worth mentioning that the software automatically created the caption with the description of the years, so it shows that research on this topic began to take shape from 2016 onwards.

Later, the papers were read to identify which documents were covered by the textual analysis. In addition to those in Figure 3, earnings conference calls stand out as the object of analysis in 10 papers. Table 3 presents the documents used for textual analysis and the frequency with which they were used.

Table 3
Objects of textual analysis

Object of analysis	Number of papers
Financial news	31
Corporate disclosures	29
Social media	16
Other documents	8

Source: study's data, 2022.

Note that the sum of the numbers in Table 3 surpasses the 78 articles that made up the sample. The reason is that some studies consulted multiple data sources, analyzing financial news in conjunction with social media (Sun, Najand & Shen, 2016; Maragoudakis, 2016; Li, Wang, Wang, Li, Liu, & Chen, 2017; Griffith, Najand, & Shen, 2019; Gan, Alexeev, Bird, & Yeung, 2020), or financial news together with corporate disclosures (Eachempati & Srivastava, 2021).

Most studies used a dictionary, classifying the words under a positive or negative tone or under other pre-established categories to capture the documents' textual sentiment. The dictionary most frequently used was that of Loughran and McDonald (2011), applied in 36 of the 78 articles analyzed. The reason is that a dictionary specifically created to capture sentiments in the financial field is preferable (Myšková, Hájek, & Olej, 2018).

In this sense, studies classifying the tone using the Loughran and McDonald dictionary (2011) and the Harvard dictionary showed that the dictionary created to be specifically used in finance is more accurate than the Harvard publication (Price et al., 2012; Ferris, Hao, & Liao, 2013; Li, Wu, & Wang, 2020).

Some researchers who chose not to use the dictionary by Loughran and McDonald (2011) created their list of words and classified the tone or sentiment of each to adapt it for their purposes. For example, Brau, Cicon, and McQueen (2016) argue that they created their word list due to the specificity of their objective, which was to analyze the strategic tone in IPO registration documents.

Other researchers did not use wordlists. It is the case of Ibriyamova, Kogan, Salganik-Shoshan, and Stolin (2017), who used semantic fingerprinting to measure the similarity between companies based on their descriptions and show that the degree of similarity helps to predict the correlation of returns on the shares of these companies. More sophisticated methods were also found to analyze textual sentiment, such as Schumaker and Chen (2009), who built a system to predict market variations by applying three textual analysis techniques through machine learning: I) Bag of words, II) noun phrases, and III) named entities. Also noteworthy is the study by Zhang, Wang, Zhu, Wang, and Ghei (2019), which proposes a hybrid neural network model for classifying and computing feelings.

Regarding the proxy for measuring stock returns, gross return for “company x” in the year/month/day/hour *t* after a particular event is predominantly used. Also important is the use of other measures, such as the Cumulative Abnormal Return (CAR), considering the difference between the gross return on the stock and the return on a market index (Kiesel, 2021), the Buy-and-Hold Return (Jiang, Lee, Martin & Zhou, 2019), and the abnormal return estimated by the market model (Campbell, Cecchini, Cianci, Ehinger, & Werner, 2019; Wu & Lin, 2017).

Studies using the excess return obtained through the risk factor model of Carhart (1997) were also found, such as Hillert, Jacobs, and Müller (2018), or the three risk factors by Fama and French (1993), and five risk factors by Fama and French (2015), adopted by Houlihan and Creamer (2017) and Buehlmaier and Whited (2018), respectively. The approach Doukas, Guo, Lam, and Xiao (2016) adopted was the market-adjusted abnormal return for short-term analysis and the Buy-and-Hold Abnormal Return (BHAR) for the long term; one can use BHAR to calculate the abnormal return of stocks with different volatility and lower bias in the long term than CAR (Yan, Xiong, Meng, & Zou, 2019).

4.2 Main Contributions and Research Possibilities

4.2.1 Financial News

The financial news was the studies’ primary data source for textual analysis. The oldest paper in the sample is that of Schumaker and Chen (2009), which analyzed the news through experimental research and used a system based on machine learning. They show the correlation between the future prices of companies’ shares and the news concerning these companies.

Other studies used a forecasting algorithm, with the aid of neural networks, to connect the textual sentiment of the news obtained by textual analysis to a predominantly numerical model based on technical analysis indicators to predict the intraday return of stocks (Geva & Zahavi, 2014; Li et al., 2020). The results showed that integrating market data with textual data increases the models’ predictive power, according to tests conducted with 72 companies from the S&P 500 (Geva & Zahavi, 2014) and the Hong Kong Stock Exchange (Li et al., 2020).

Ahmad, Han, Hutson, Kearney, and Liu (2016) analyzed the news of 20 large companies in the United States of America (USA) published over ten years, using the dictionary of Loughran and McDonald (2011) with the words that are typically negative in finance contexts. They estimated a model with autoregressive vectors and found that the negative tone extracted from the news has a counterproductive effect on the return – which, when significant, tends to last for long periods instead of reversing in the short term.

In more recent papers, Glasserman and Mamayski (2019) show that news considered "unusual" and with negative sentiment increases volatility in the stock market, whereas "unusual" news with positive sentiment predicts lower volatility. From the same perspective, Gan et al. (2020) revealed that the link between volatility and news sentiment is more persistent than between returns and sentiment. The authors also found evidence that, from 2016 onwards, textual sentiment from social networks became a better predictor of market variations than news.

Debata, Ghate, and Renganathan (2021) analyzed sentiment in the context of the Covid-19 pandemic, specifically in 2020. They found that an index based on the intensity of Google's search volume is a more representative proxy for public sentiment than an index based on newspaper headlines. However, that paper was the only one in the sample to address the pandemic scenario, and its main limitation is that it addressed the Indian market only - thus leaving significant research gaps regarding the relationship between pandemic sentiment and the stock market.

In general, the studies that capture the textual sentiment of financial news vary considerably not only in the methods adopted, such as dictionaries, neural networks, and machine learning, but also in terms of focus. It is a consensus in the literature that news affect the prices practiced in the stock market and constitutes the source of information to which textual analysis is the most frequently applied in finance.

4.2.2 Corporate disclosures

Corporate disclosures correspond to textual documents that companies prepare and disclose. In this topic, corporate disclosures are divided into three categories: 10-K and 8-K Reports (14), Earnings Conference Calls (11), and Pre-IPO Documents (6). Again, the sum of the papers surpasses the 29 papers dealing with corporate disclosures, as some investigated more than one type of document.

By individually analyzing the return proxies used when the textual analysis was employed in these documents, CAR was found to be the most predominant measure, followed by Buy-and-Hold Return, which comprises 59% of the papers. A potential explanation is that several papers that focused on financial news and social media were published in journals in the field of information technology (IT), specifically capturing the textual sentiment with the use of technology; studies using corporate disclosures are concentrated in the fields of accounting and finance, where there is greater familiarity with more sophisticated return measures.

8-K documents deal with specific events, provide details and reports about what has been happening with a company, and are filed with the SEC. Feuerriegel & Prölloch (2021) and Filip, Lobo, Paugam, and Stolowy (2021) investigated how stock prices vary in response to the disclosure of mergers and acquisitions – the first adopted a data mining approach, more specifically a Latent Dirichlet allocation (LDA); and the second used its own list of words. Empirical evidence found in both studies showed a negative and statistically significant effect on abnormal returns in response to the disclosure of mergers and acquisitions at intervals of 1 and 3 days after the disclosure.

The effects resulting from the release of reports are not limited to short-term reactions. Cohen, Malloy, and Nguyen (2020) showed that changes in the language and construction of financial reports have substantial implications for the companies' future returns and operations. Such changes are gradually incorporated into asset prices over the 12 to 18-month period after the reporting change and have no short-term effects after the announcement.

Regarding the result of conference calls, Price et al. (2012) conducted a study to capture the tone of these conferences, separating the presentation part conducted by the administration from the questions and answers. The findings showed that the Q&A portion of these calls had significant predictive capacity for the CAR initial reaction and explanatory power during the 60 trading days after the conference call. Additional results also showed that the tone becomes more relevant in companies that do not pay dividends.

Manager sentiment analyzed in earnings conference calls is considered complementary to investor sentiment in forecasting stock returns, implying that manager sentiment has a different impact on the assessment than investor sentiment (Jiang et al., 2019). This finding allows the interaction of both feelings, obtained through different textual sources, to increase the predictive power of abnormal returns based on sentiments, which was not found in the studies analyzed in this review.

Praise made by analysts during the calls also proved to have explanatory power for stock returns. Milian and Smith (2017) examined 16,609 conference calls from S&P 500 companies and found that the number of accolades, such as "great year" and "good quarter," predicted abnormal stock returns in the next quarter. The tone of analysts and company representatives can be further explored in the literature, investigating whether they are complementary or have similar explanatory power.

Information disclosed to a regulatory body, such as the SEC in the USA, before a company goes public makes textual analysis a potential tool to predict post-IPO returns. Loughran and McDonald (2013) showed that the tone of the first SEC registration in the IPO process could predict returns on the asset's first trading day. The findings showed that high levels of uncertain text have higher returns on the first trading day.

In the same sense, Ferris, Hao, and Liao (2013) revealed that the element of conservatism in the text of IPO prospectuses of non-technology companies is inversely related to the abnormal return on a company's shares after its IPO. These results show that both the tone of the S-1 report used by Loughran and McDonald (2013) and the prospective information have explanatory power in post-IPO stock returns.

Notably, research involving corporate disclosures, whether through 10-K or 8-K reports, earnings conference calls, and pre-IPO documents, does not have developed literature such as textual analysis in traditional and social media, so there are no varied methods, markets investigated, or the objectives proposed. Such a fact enables a range of research opportunities to investigate the capital markets of other countries with different time frames and objectives.

Studies specifically involving earnings conference calls show evidence that investors are aware of companies' voluntary disclosures, considering this corporate event influences the market. Because it represents an expanding field in the literature, there are research gaps in methodological aspects, mainly in measuring textual sentiment, which can be quantified differently from those already documented in studies investigating earnings conference calls.

4.2.3 Social Media

Social media is one way to capture investors' sentiments and opinions because it is where investors, analysts, and other stakeholders share their investment analyses and/or comment on other investors' opinions. Additionally, investors' sentiments broadcast on social media might refer to a specific asset or a broader opinion about the market's direction. Both company-specific and broader market opinions can predict price changes within a five-minute window, as found by Broadstock and Zhang (2019).

Chen et al. (2014) used the dictionary by Loughran and McDonald (2011) to understand whether the opinions shared by investors could predict variations in the capital market. The results showed that the fraction of negative words in papers and comments on a popular social network among investors in the United States could negatively predict stock returns over the next three months, even controlling for the effects of analyst recommendations and traditional news media.

The language adopted in social media sometimes differs from the usual formality adopted in companies' reports and the news published by traditional media. The reason is that publications and comments on social media are disseminated by the most diverse users using informal language. Meanwhile, the news in traditional media is published by journalists who communicate facts formally. Hence, Renault (2017) built a lexicon of words commonly used by investors in social media. This lexicon had a significantly higher predictive power than the dictionaries most frequently used in the literature. The author added more complex machine learning algorithms, and the results remained competitive.

Xu, Pang, and Han (2021) opted for a different alternative to the word list to measure textual sentiment. They used an index derived from Twitter posts through textual analysis as a proxy for online sentiment, the Daily Happiness Index (DHS). Their findings revealed a power-law cross-correlation between the financial market and online sentiment in some developed countries and all developing countries analyzed in the sample, represented by Brazil and India.

The social media in which the users' feelings were captured are shown in Table 4 below. Some studies selected only one media (Broadstock & Zhang, 2019; Chen et al., 2014), while others used more than one (Griffith Najand & Shen, 2020; Gan et al., 2020). Choosing media is explained by the fact that they are the most popular among investors in the USA.

Table 4
Social Media used

Social Media	
Seeking Alpha	Yahoo!Finance
StockTwits	Sina
Twitter	EastMoney

Source: study's data, 2022.

Studies analyzing the investors' sentiment expressed in social media are more recent than those that use traditional media as a source of information. Although research on social media represents approximately 21% of the papers analyzed in this review, we need to consider the growing expansion of this type of communication, which provides new research opportunities to analyze, for example, other media used by investors.

4.2.4 Other Documents

Among the studies analyzing other documents, the Central Bank's speeches stand out, which were the object of research in two papers by Anand, Basu, Pathak, and Thampy (2021) and Möller and Reichmann (2021). The language used by Central Bank officials in public press conferences and how this factor influences stock returns in the euro area was examined using the dictionary of Loughran and McDonald (2011). The results showed that feelings of uncertainty had a significant positive effect on the intraday returns of the index of the top 50 companies in the Eurozone before the global financial crisis; i.e., uncertainty is interpreted as a sign of future political accommodation, causing the market reacts positively (Möller & Reichmann, 2021).

The textual tone of qualitative information in analyst reports also demonstrated explanatory power over 12-month abnormal returns, as evidenced by Caylor, Cecchini, and Winchel (2017). Likewise, a study conducted in the Chinese market (Li, He, Chan, 2021) shows that the disclosure of qualitative risk information of companies can negatively affect the return on shares of their suppliers, corroborating the notion that textual sentiment in documents external to the company influences stock returns.

Credit rating reports are another document, the textual tone of which can influence variations in stock prices. Agarwal, Chen, and Zhang (2016) identified that net linguistic tone (negative tone minus positive tone) in reports is significantly and negatively related to abnormal stock returns, in addition to being able to predict future rating variations. On the other hand, the empirical evidence found by Kiesel (2021) among companies listed in the United States and Europe, does not provide clear conclusions about whether rating updates can affect stock returns.

Thus, regarding credit rating reports, future studies are suggested to use other alternatives to explore the measurement of textual sentiment, seeking to resolve this impasse on the potential influence of the tone of reports on stock prices. Additionally, all the studies investigating credit rating reports, analyst reports, and Central Bank speeches are concentrated on the American in European markets. For comparison purposes, future research may obtain empirical evidence on the relationship between textual tone and stock returns in the documents cited in emerging markets.

5. Final considerations

This systematic literature review provides an overview of how research addressing textual analysis as a tool for predicting stock returns in the capital market has evolved. A total of 78 studies addressing this topic were analyzed. They were all published in English in 50 different journals. Analysis was conducted using the VosViewer® software, and the papers were classified into categories representing the documents in which textual analysis was applied.

Four primary sources of information used in textual analysis emerged from this classification: financial news (31), corporate disclosures (29), social media (16), and a fourth source, which represents other documents (8). The main evidence found in each category was compiled, and potential directions are indicated for future research.

Analysis of the sample showed that most papers used a dictionary to classify words according to tone and capture the documents' textual sentiment. The dictionary by Loughran and McDonald (2011) was the most frequently adopted; 36 out of the 78 papers used it. Regarding the proxy applied to capture market reactions, the most frequently used was the gross return of stocks. Most studies included in this review were conducted in the American capital market, representing approximately 58% of the papers addressed here.

Studies classified under financial news and social media are the most representative in the sample (47 papers) and present a greater variety of methods, samples, and specificities than the other categories. Therefore, financial news and social media represent the primary sources of information for applying textual analysis in finance when the objective is to associate the textual tone with market reactions.

As for the other categories, there are documents involving the companies' disclosures, which may be voluntary (e.g., earnings conference calls) or mandatory (10-K, 8-K reports, and pre-IPO documents). In these cases, the studies have some differences, showing that more research is needed to explore the various gaps. Furthermore, investigating developing countries is an opportunity for future research, as well as studies comparing between developed and developing countries.

There are also studies classified under other documents (8), i.e., documents not disclosed by the companies and not referring to financial news or social media. The sentiment of the Central Bank's speeches stands out in this category, which proved to be related to the return of shares. However, only three studies were found, all in the European environment. Hence, there is the possibility of further studies addressing the relationship of such disclosure with stock prices.

In general, evidence found in the papers addressed here shows that textual sentiment can predict the return of shares, being captured from the most diverse sources of information. Therefore, the EMH cannot explain these results, considering that this theory is premised on the investors' rationality. However, the EMH can still be tested under conditions different from those addressed in the sample studies.

This study contributes to the dissemination of the systematic literature review technique in research conducted in the fields of finance and accounting. Although there is an increase in the number of publications, this technique is not widely disseminated in this field of knowledge. In the academic milieu, this study contributes to systematizing this topic's state of the art. It can be helpful to those intending to conduct similar studies in the future. As practical implications, investors can learn how textual sentiment affects their stock investments.

One of this study's limitations is that only papers written in English were included. Second, the Web of Science was the only database searched; hence, relevant studies not indexed by this database may have been omitted. Consequently, further research is suggested to investigate other databases and include studies written in other languages. Additionally, future studies are suggested to explore this topic by categorizing studies considering geographic regions, which could provide new insights and enrich the debate on the influence of textual sentiment on stock returns in different regional contexts.

References

Agarwal, S., Chen, V. Y. S., & Zhang, W. (2016). The information value of credit rating action reports: a textual analysis. *Management Science*, *62*(8), 2218-2240. Recuperado de https://doi.org/10.1287/mnsc.2015.2243

Ahmad, K., Han, J., Hutson, E., Kearney, C., & Liu, S. (2016). Media-expressed negative tone and firm-level stock returns. *Journal of Corporate Finance*, *37*, 152-172. Recuperado de https://doi.org/10.1016/j.jcorpfin.2015.12.014

Ahmad, S., & Omar, R. (2016). Basic corporate governance models: a systematic review. *International Journal of Law and Management*, *58*(1), 73-107. Recuperado de https://doi.org/10.1108/ijlma-10-2014-0057

Anand, A., Basu, S., Pathak, J., & Thampy, A. (2021). The impact of sentiment on emerging stock markets. *International Review of Economics & Finance,* 75(1), 161–177. Recuperado de https://doi.org/10.1016/j.iref.2021.04.005

Anand, A., Basu, S., Pathak, J., & Thampy, A. (2021). Whose speeches impact European markets: ECB's or the national central banks'? *European Financial Management*, 28(5), 1413–1476). Recuperado de https://doi.org/10.1111/eufm.12334

Ball, R. (1992). The earnings-price anomaly. *Journal of Accounting and Economics*, *15*(2-3), 319-345. Recuperado de https://doi.org/10.1016/0165-4101(92)90023-u

Bian, S., Jia, D., Li, R., Sun, W., Yan, Z., & Zheng, Y. (2021). Can management tone predict IPO performance? – Evidence from mandatory online roadshows in China. *Pacific-Basin Finance Journal,* 68(1), 101588). Recuperado de https://doi.org/10.1016/j.pacfin.2021.101588

Boudoukh, J., Feldman, R., Kogan, S., & Richardson, M. (2018). Information, trading, and volatility: evidence from firm-specific news. *The Review of Financial Studies*, *32*(3), 992-1033. Recuperado de https://doi.org/10.1093/rfs/hhy083

Box, T. (2018). Qualitative similarity and stock price comovement. *Journal of Banking & Finance*, *91*, 49-69. Recuperado de https://doi.org/10.1016/j.jbankfin.2018.04.010

Brau, J. C., Cicon, J., & McQueen, G. (2016). Soft strategic information and IPO underpricing. *Journal of Behavioral Finance*, *17*(1), 1-17. Recuperado de https://doi.org/10.1080/15427560.2016.1133619

Broadstock, D. C., & Zhang, D. (2019). Social-media and intraday stock returns: the pricing power of sentiment. *Finance Research Letters*, *30*, 116-123. Recuperado de https://doi.org/10.1016/j.frl.2019.03.030

Brochet, F., Kolev, K., & Lerman, A. (2018). Information transfer and conference calls. *Review of Accounting Studies*, *23*(3), 907–957. Recuperado de https://doi.org/10.1007/s11142-018-9444-4

Brock, W., Lakonishok, J., & Lebaron, B. (1992). Simple technical trading rules and the stochastic properties of stock returns. *The Journal of Finance*, *47*(5), 1731-1764. Recuperado de https://doi.org/10.1111/j.1540-6261.1992.tb04681.x

Brockman, P., Li, X., & Price, S. M. (2017). Conference Call tone and stock returns: evidence from the stock exchange of Hong Kong. *Asia-Pacific Journal of Financial Studies*, *46*(5), 667-685. Recuperado de https://doi.org/10.1111/ajfs.12186

Buehlmaier, M. M. M., & Whited, T. M. (2018). Are financial constraints priced? Evidence from textual analysis. *The Review of Financial Studies*, *31*(7), 2693-2728. Recuperado de https://doi.org/10.1093/rfs/hhy007

Campbell, J. L., Cecchini, M., Cianci, A. M., Ehinger, A. C., & Werner, E. M. (2018). Tax-related mandatory risk factor disclosures, future profitability, and stock returns. *Review of Accounting Studies*, *24*(1), 264-308. Recuperado de https://doi.org/10.1007/s11142-018-9474-y

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, *52*(1), 57-82. Recuperado de https://doi.org/10.1111/j.1540-6261.1997.tb03808.x

Carlini, F., Cucinelli, D., Previtali, D., & Soana, M. G. (2020). Don't talk too bad! stock market reactions to bank corporate governance news. *Journal of Banking & Finance* (Vol. 121, p. 105962). Recuperado de https://doi.org/10.1016/j.jbankfin.2020.105962

Caylor, M., Cecchini, M., & Winchel, J. (2017). Analysts' qualitative statements and the profitability of favorable investment recommendations. *Accounting, organizations and society*, *57*, 33-51. Recuperado de https://doi.org/10.1016/j.aos.2017.03.005

Chen, H., De, P., Hu, Y. (Jeffrey), & Hwang, B.-H. (2014). Wisdom of crowds: the value of stock opinions transmitted through social media. *Review of Financial Studies*, *27*(5), 1367-1403. Recuperado de https://doi.org/10.1093/rfs/hhu001

Chen, J., Demers, E., & Lev, B. (2018). Oh what a beautiful morning! Diurnal influences on executives and analysts: evidence from conference calls. *Management Science*, *64*(12), 5899-5924. Recuperado de https://doi.org/10.1287/mnsc.2017.2888

Chen, S., Liu, T., Peng, Q., & Zhao, Y. (2021). Manager Sentiment Bias and Stock Returns: Evidence from China. *Emerging Markets Finance and Trade*, 58(3), 823–836. Recuperado de https://doi.org/10.1080/1540496x.2021.1918543

Cohen, L., Malloy, C., & Nguyen, Q. (2020). Lazy Prices. *The Journal of Finance*, *75*(3), 1371-1415. Recuperado de https://doi.org/10.1111/jofi.12885

Debata, B., Ghate, K., & Renganathan, J. (2021). COVID-19 pandemic sentiment and stock market behavior: evidence from an emerging market. *Review of Behavioral Finance*. Recuperado de https://doi.org/10.1108/rbf-05-2021-008

Doukas, A. J., Guo, J. M., Lam, H. Y. T., & Xiao, S. H. (2014). Media endorsements of new product announcements: a new marketing strategy. *European Financial Management*, *22*(3), 394-426. Recuperado de https://doi.org/10.1111/eufm.12057

Eachempati, P., & Srivastava, P. R. (2021). Accounting for investor sentiment in news and disclosures. *Qualitative Research in Financial Markets*, *14*(1), 53-75. Recuperado de https://doi.org/10.1108/qrfm-01-2020-0006

Fama, E. F. (1970). Efficient capital markets: a review of theory and empirical work. *The Journal of Finance*, *25*(2), 383-417. Recuperado de https://doi.org/10.1111/j.1540-6261.1970.tb00518.x

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, *33*(1), 3-56. Recuperado de https://doi.org/10.1016/0304-405x(93)90023-5

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics*, *116*(1), 1-22. Recuperado de https://doi.org/10.1016/j.jfineco.2014.10.01

Feldman, R., Govindaraj, S., Livnat, J., & Segal, B. (2009). Management's tone change, post earnings announcement drift and accruals. *Review of Accounting Studies*, *15*(4), 915-953. Recuperado de https://doi.org/10.1007/s11142-009-9111-x

Ferris, S. P., Hao, (Grace) Qing, & Liao, (Stella) Min-Yu. (2012). The effect of issuer conservatism on IPO pricing and performance. *Review of Finance*, *17*(3), 993-1027. Recuperado de https://doi.org/10.1093/rof/rfs018

Feuerriegel, S., & Prendinger, H. (2016). News-based trading strategies. *Decision Support Systems*, 90, 65–74. Recuperado de https://doi.org/10.1016/j.dss.2016.06.020

Feuerriegel, S., & Pröllochs, N. (2018). Investor Reaction to Financial Disclosures across Topics: An Application of Latent Dirichlet Allocation. *Decision Sciences*, *52*(3), 608–628. Recuperado de https://doi.org/10.1111/deci.12346

Filip, A., Lobo, G. J., Paugam, L., & Stolowy, H. (2021). Disclosures About Key Value Drivers in M&A Announcement Press Releases: An Exploratory Study. *Abacus*, *58*(1), 62–104. Recuperado de https://doi.org/10.1111/abac.12234

Galdi, F. C., & Gonçalves, A. M. (2018). Pessimism and uncertainty of the news and investor's behavior in Brazil. *Revista de Administração de Empresas*, *58*(2), 130-148. Recuperado de https://doi.org/10.1590/s0034-759020180203

Gan, B., Alexeev, V., Bird, R., & Yeung, D. (2020). Sensitivity to sentiment: news vs social media. *International Review of Financial Analysis*, *67*, 101390. Recuperado de https://doi.org/10.1016/j.irfa.2019.101390

Garcia-Lopez, F. J., Batyrshin, I., & Gelbukh, A. (2018). Analysis of relationships between tweets and stock market trends [JB*]. Journal of Intelligent & Fuzzy Systems*, *34*(5), 3337-3347. Recuperado de https://doi.org/10.3233/JIFS-169515

Geva, T., & Zahavi, J. (2014). Empirical evaluation of an automated intraday stock recommendation system incorporating both market data and textual news. *Decision Support Systems*, *57*, 212–223. Recuperado de https://doi.org/10.1016/j.dss.2013.09.013

Glasserman, P., & Mamaysky, H. (2019). Does Unusual news forecast market stress? *Journal of Financial and Quantitative Analysis*, *54*(5), 1937-1974. Recuperado de https://doi.org/10.1017/s0022109019000127

Griffith, J., Najand, M., & Shen, J. (2019). Emotions in the stock market. *Journal of Behavioral Finance*, *21*(1), 42-56. Recuperado de https://doi.org/10.1080/15427560.2019.1588275

Gu, W., Zhang, L., Xi, H., & Zheng, S. (2021). Stock Prediction Based on News Text Analysis. *Journal of Advanced Computational Intelligence and Intelligent Informatics*, *25*(5), 581–591. Recuperado de https://doi.org/10.20965/jaciii.2021.p058

Hájek, P. (2017). Combining bag-of-words and sentiment features of annual reports to predict abnormal stock returns. *Neural Computing and Applications*, *29*(7), 343-358. Recuperado de https://doi.org/10.1007/s00521-017-3194-2

Hassan, T. A., Hollander, S., van Lent, L., & Tahoun, A. (2019). Firm-level political risk: measurement and effects. *The Quarterly Journal of Economics*, *134*(4), 2135-2202. Recuperado de https://doi.org/10.1093/qje/qjz021

Hatefi Ghahfarrokhi, A., & Shamsfard, M. (2020). Tehran stock exchange prediction using sentiment analysis of online textual opinions. *Intelligent Systems in Accounting, Finance and Management*, *27*(1), 22-37. Recuperado de https://doi.org/10.1002/isaf.1465

He, Y., Qu, L., Wei, R., & Zhao, X. (2021). Media-based investor sentiment and stock returns: a textual analysis based on newspapers. *Applied Economics*, *54*(7), 774–792. Recuperado de https://doi.org/10.1080/00036846.2021.1966369

Hendricks, B. E., Lang, M., & Merkley, K. (2021). Through the eyes of the founder: CEO characteristics and firms' regulatory filings. *Journal of Business Finance &Amp; Accounting*, *49*(3–4), 383–422. Recuperado de https://doi.org/10.1111/jbfa.12572

Hillert, A., Jacobs, H., & Müller, S. (2018). Journalist disagreement. *Journal of Financial Markets*, *41*, 57-76. Recuperado de https://doi.org/10.1016/j.finmar.2018.09.002

Houlihan, P., & Creamer, G. G. (2017). Can sentiment analysis and options volume anticipate future returns? *Computational Economics*, *50*(4), 669-685. Recuperado de https://doi.org/10.1007/s10614-017-9694-4

Huang, A. G., Tan, H., & Wermers, R. (2020). Institutional Trading around Corporate News: Evidence from Textual Analysis. *The Review of Financial,* 33(10), 4627–4675). Recuperado de https://doi.org/10.1093/rfs/hhz136

Ibriyamova, F., Kogan, S., Salganik-Shoshan, G., & Stolin, D. (2016). Using semantic fingerprinting in finance. *Applied Economics*, *49*(28), 2719-2735. Recuperado de https://doi.org/10.1080/00036846.2016.1245844

Ibriyamova, F., Kogan, S., Salganik-Shoshan, G., & Stolin, D. (2018). Predicting stock return correlations with brief company descriptions. *Applied Economics*, *51*(1), 88-102. Recuperado de https://doi.org/10.1080/00036846.2018.1494377

Jiang, F., Lee, J., Martin, X., & Zhou, G. (2019). Manager sentiment and stock returns. *Journal of Financial Economics*, *132*(1), 126-149. Recuperado de https://doi.org/10.1016/j.jfineco.2018.10.001

Kahneman, D. (1994). New Challenges to the Rationality Assumption. *Journal of Institutional and Theoretical Economics (JITE)*, *150*(1), 18-36. Recuperado de http://www.jstor.org/stable/40753012

Kearney, C., & Liu, S. (2014). Textual sentiment in finance: a survey of methods and models. *International Review of Financial Analysis*, *33*, 171-185. Recuperado de https://doi.org/10.1016/j.irfa.2014.02.006

Kiesel, F. (2021). It's the tone, stupid! Soft information in credit rating reports and financial markets. *Journal of Financial Research*, *44*(3), 553–585. Recuperado de https://doi.org/10.1111/jfir.12250

Li, J., Li, J., & Zhu, X. (2020). Risk dependence between energy corporations: a text-based measurement approach. *International Review of Economics & Finance*, *68*, 33-46. Recuperado de 10.1016/j.iref.2020.02.009

Li, Q., Wang, J., Wang, F., Li, P., Liu, L., & Chen, Y. (2016). The role of social sentiment in stock markets: a view from joint effects of multiple information sources. *Multimedia Tools and Applications, 76*(10), 12315-12345. Recuperado de https://doi.org/10.1007/s11042-016-3643-4

Li, S., Ning, K., & Zhang, T. (2021). Sentiment-aware jump forecasting. *Knowledge-Based Systems*, *228*, 107292. Recuperado de https://doi.org/10.1016/j.knosys.2021.107292

Li, X., Wu, P., & Wang, W. (2020). Incorporating stock prices and news sentiments for stock market prediction: a case of Hong Kong. *Information Processing & Management*, *57*(5), 102212. Recuperado de https://doi.org/10.1016/j.ipm.2020.102212

Li, X., Xie, H., Chen, L., Wang, J., & Deng, X. (2014). News impact on stock price return via sentiment analysis. *Knowledge-Based Systems*, *69*, 14-23. Recuperado de https://doi.org/10.1016/j.knosys.2014.04.022

Li, Y., He, J., & Chan, K. C. (2021). Information transmission along supply chains: Stock price reaction of suppliers upon a customer's release of qualitative risk information. *International Journal of Production Economics*, *239*, 108189. Recuperado de https://doi.org/10.1016/j.ijpe.2021.108189

Liu, S., & Han, J. (2020). Media tone and expected stock returns. *International Review of Financial Analysis*, *70*, 101522. Recuperado de https://doi.org/10.1016/j.irfa.2020.101522

Lo, A. W. (2004). The adaptive markets hypothesis. *The Journal of Portfolio Management*, *30*(5), 15-29. Recuperado de https://doi.org/10.3905/jpm.2004.442611

Loughran, T., & Mcdonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *The Journal of Finance*, *66*(1), 35-65. Recuperado de https://doi.org/10.1111/j.1540-6261.2010.01625.x

Loughran, T., & McDonald, B. (2011b). Barron's Red Flags: Do They Actually Work? *Journal of Behavioral Finance*, *12*(2), 90-97. Recuperado de https://doi.org/10.1080/15427560.2011.575971

Loughran, T., & McDonald, B. (2013). IPO first-day returns, offer price revisions, volatility, and form S-1 language. *Journal of Financial Economics*, *109*(2), 307-326. Recuperado de https://doi.org/10.1016/j.jfineco.2013.02.017

Loughran, T., & McDonald, B. (2020). Textual Analysis in Finance. *Annual Review of Financial Economics*, *12*(1), 357-375. Recuperado de https://doi.org/10.1146/annurev-financial-012820-032249

Lutz, B., Pröllochs, N., & Neumann, D. (2020). Predicting sentence-level polarity labels of financial news using abnormal stock returns. *Expert Systems with Applications*, *148*, 113223. Recuperado de https://doi.org/10.1016/j.eswa.2020.113223

Lv, Y., Piao, J., Li, B., & Yang, M. (2021). Does online investor sentiment impact stock returns? Evidence from the Chinese stock market. *Applied Economics Letters*, *29*(15), 1434–1438. Recuperado de https://doi.org/10.1080/13504851.2021.1937490

Malaquias, R. F., & Júnior, D. M. B. (2021). Positive Tone in Management Reports and Volatility of Stock Returns. *Global Business Review*, 097215092110542. Recuperado de https://doi.org/10.1177/09721509211054279

Mangee, N. (2018). Stock Returns and the Tone of Marketplace Information: does Context matter? *Journal of Behavioral Finance*, *19*(4), 396–406. Recuperado de https://doi.org/10.1080/15427560.2018.1405268

Maragoudakis, M., & Serpanos, D. (2015). Exploiting financial news and social media opinions for stock market analysis using MCMC Bayesian Inference. *Computational Economics*, *47*(4), 589-622. Recuperado de https://doi.org/10.1007/s10614-015-9492-9

Marquez-Illescas, G., Zebedee, A. A., & Zhou, L. (2018). Hear Me Write: does CEO narcissism affect disclosure? *Journal of Business Ethics*, *159*(2), 401-417. Recuperado de https://doi.org/10.1007/s10551-018-3796-3

Milian, J. A., & Smith, A. L. (2017). An investigation of analysts' praise of management during earnings conference calls. *Journal of Behavioral Finance*, *18*(1), 65-77. Recuperado de https://doi.org/10.1080/15427560.2017.1276068

Möller, R., & Reichmann, D. (2021). ECB language and stock returns – A textual analysis of ECB press conferences. *The Quarterly Review of Economics and Finance*, *80*, 590–604. Recuperado de https://doi.org/10.1016/j.qref.2021.04.003

Myšková, R., & Hájek, P. The effect of managerial sentiment on market to-book ratio. *Transformations in Business & Economics*, *15*(2A), 498-513. Recuperado de https://dk.upce.cz/handle/10195/67653

Myšková, R., Hájek, P., & Olej, V. (2017) Predicting abnormal stock return volatility using textual analysis of news – A meta-learning approach. *Amfiteatru Economic*, *20*(47), 185-201. Recuperado de https://www.ceeol.com/search/article-detail?id=678584

Price, S. M., Doran, J. S., Peterson, D. R., & Bliss, B. A. (2012). Earnings conference calls and stock returns: the incremental informativeness of textual tone. *Journal of Banking & Finance*, *36*(4), 992–1011. Recuperado de https://doi.org/10.1016/j.jbankfin.2011.10.013

Renault, T. (2017). Intraday online investor sentiment and return patterns in the U.S. stock market. *Journal of Banking & Finance*, *84*, 25-40. Recuperado de https://doi.org/10.1016/j.jbankfin.2017.07.002

Rozeff, M. S., & Kinney, W. R., Jr. (1976). Capital market seasonality: the case of stock returns. *Journal of Financial Economics*, *3*(4), 379-402. Recuperado de https://doi.org/10.1016/0304-405x(76)90028-3

Sampaio, R.F., & Mancini, M.C. (2007). Estudos de revisão sistemática: um guia para síntese criteriosa da evidência científica. *Revista Brasileira de Fisioterapia, 11*(1),83-89. Recuperado de https://www.redalyc.org/articulo.oa?id=2350/235016477013

Sampath, V. S., O'Connor, A. J., & Legister, C. (2021). Moral leadership and investor attention: An empirical assessment of the potus's tweets on firms' market returns. *Review of Quantitative Finance and Accounting*, *58*(3), 881–910. Recuperado de https://doi.org/10.1007/s11156-021-01012-0

Schumaker, R. P., & Chen, H. (2009). Textual analysis of stock market prediction using breaking financial news. *ACM Transactions on Information Systems*, *27*(2), 1-19. Recuperado de https://doi.org/10.1145/1462198.1462204

Seng, J.-L., & Yang, H.-F. (2017). The association between stock price volatility and financial news – a sentiment analysis approach. *Kybernetes*, *46*(8), 1341-1365. Recuperado de https://doi.org/10.1108/k-11-2016-0307

Sun, L., Najand, M., & Shen, J. (2016). Stock return predictability and investor sentiment: a high-frequency perspective. *Journal of Banking & Finance*, *73*, 147–164. Recuperado de https://doi.org/10.1016/j.jbankfin.2016.09.010

Suslava, K. (2021). "Stiff Business Headwinds and Uncharted Economic Waters": The Use of Euphemisms in Earnings Conference Calls. *Management Science*, *67*(11), 7184–7213. Recuperado de https://doi.org/10.1287/mnsc.2020.3826

Takahashi, S., Takahashi, M., Takahashi, H., & Tsuda, K. (2006, october). Analysis of stock price return using textual data and numerical data through text mining. In *Lecture Notes in Computer Science*. Recuperado de https://doi.org/10.1007/11893004_40

Wang, Q., & Waltman, L. (2016). Large-scale analysis of the accuracy of the journal classification systems of Web of science and scopus. *Journal of Informetrics*, *10*(2), 347-364. Recuperado de https://doi.org/10.1016/j.joi.2016.02.003

Wu, C.-H., & Lin, C.-J. (2017). The impact of media coverage on investor trading behavior and stock returns. *Pacific-Basin Finance Journal*, *43*, 151-172. Recuperado de https://doi.org/10.1016/j.pacfin.2017.04.001

Xu, K., Pang, Y., & Han, J. (2021). Dynamic Cross-Correlation between Online Sentiment and Stock Market Performance: A Global View. *Discrete Dynamics in Nature and Society*, *2021*, 1–11. Recuperado de https://doi.org/10.1155/2021/6674379

Yan, Y., Xiong, X., Meng, J. G., & Zou, G. (2019). Uncertainty and IPO initial returns: evidence from the tone analysis of China's IPO prospectuses. *Pacific-Basin Finance Journal*, *57*, 101075. Recuperado de https://doi.org/10.1016/j.pacfin.2018.10.004

Yang, A. S. (2020). Misinformation corrections of corporate news: corporate clarification announcements. *Pacific-Basin Finance Journal*, *61*, 101315. Recuperado de https://doi.org/10.1016/j.pacfin.2020.101315

Zhang, W., Wang, M., Zhu, Y., Wang, J., & Ghei, N. (2019). A hybrid neural network approach for fine-grained emotion classification and computing [JB]. *Journal of Intelligent & Fuzzy Systems*, *37*(3), 3081-3091. Recuperado de https://doi.org/10.3233/JIFS-179111

Zhao, W., Zhang, W., Xiong, X., & Zou, G. (2019). Share pledges, tone of earnings communication conferences, and market reaction: evidence from China. *Accounting & Finance*, *59*(5), 2817-2853. Recuperado de https://doi.org/10.1111/acfi.12585

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, art. 3, p. 161-178, Apr./Jun. 2023 | DOI: http://dx.doi.org/10.17524/repec.v17i2.3125 | ISSN 1981-8610

The Influence of Tax Practices on the Probability of Financial Distress among B3 Non-Financial Companies

Mirian Mara Batista da Silva
https://orcid.org/0000-0003-1669-2964

Luiz Ernani de Carvalho Junior
https://orcid.org/0000-0002-2855-2611

Eduardo Mendes Nascimento
https://orcid.org/0000-0002-2188-9748

Abstract

Objective: this study aimed to verify whether engaging in tax practices influences the probability of financial distress.

Method: financial information from 2010 to 2020 of non-financial companies listed on B3 was collected from the Refinitiv Thomson Reuters database. This information was used to measure financial distress (i.e., when earnings before interest and taxes, depreciation, and amortization (EBITDA) are lower than financial expenses, besides a drop in the company's market value in two consecutive periods) and tax practices using the following proxies: Generally Accepted Accounting Principles, Effective Tax Rate (GAAP ETR), Book-Tax Differences (BTD), CURRENT ETR, and Deferred ETR (DIF ETR). The relationship between the companies' financial distress and tax practices was obtained using logistic regression.

Results: the variable Generally Accepted Accounting Principles, Effective Tax Rate (GAAP ETR) was found to positively and significantly influence the response variable, while Book-Tax Differences (BTD) and Deferred ETR (DIF ETR) negatively and significantly affect the likelihood of financial distress to occur, suggesting that the fewer tax reducing activities a company performs, the higher the probability of it to face financial distress.

Theoretical/methodological/practical contributions: this study suggests that not engaging or using few tax strategies may be decisive for companies experiencing financial difficulties considering that companies fail to use legally obtained resources to maintain their activities.

Published in Portuguese and English. Original Version in Portuguese.

Round 1: Received in 6/15/2022. Review requested on 2/1/2023. Round 2: Resubmited on 3/24/2023. Accepted on 4/17/2023 by Vinícius Gomes Martins, PhD (Editor assistant) and by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 6/30/2023. Organization responsible for the journal: Abracicon

1. Introduction

Efficiently estimating the onset of corporate financial distress before companies enter into insolvency, or even bankruptcy (*ex-ante*), regardless of their legal consequences, has great utility and applicability in the corporate environment (Konstantaras & Siriopoulos, 2011; Pindado et al., 2008). It enables companies to implement measures and avoid insolvency, especially during crises, when corporations may become more economically and financially vulnerable.

Insolvency risks increase in times of crisis, and it is public and notorious that the international crises in the last decades, especially in 2008, 2014, and more recently, the Covid-19 pandemic, economically and financially impacted the global corporate business scenario. According to Rezende et al. (2017), internal and global crises increased the probability of company insolvency in the Brazilian context. Hence, it is important to identify a stage before this phenomenon occurs to allow companies more time to plan and implement preventive actions, increasing their opportunities to reverse such a situation.

Additionally, being able to correctly identify financial problems in advance contributes to better information disclosure to investors, as preliminary information enables managers, investors, and rating agencies to perform more efficient analyses, ensuring more security in the corporate world (Konstantaras & Siriopoulos, 2011; Pindado et al., 2008). In this sense, problems in interpreting financial information, such as those that occurred in the August 2007 crisis, which resulted in increased capital costs, can be avoided (Pindado et al., 2008).

The potential strategies to decrease the probability of financial distress include tax planning, which is a way of obtaining financial resources internally. According to Myers (1984), based on the Pecking Order Theory, internal resources are the first companies use to finance their activities. The connection between tax planning and a company's financial situation is evidenced in the literature. Chiachio & Martinez (2019) found that the level of a company's tax aggressiveness changes according to its financial structure; companies with a better financial situation present lower levels of tax aggressiveness. Rezende et al. (2018) identified that tax incentives, along with the companies' profit, are a financing source that enables companies to generate margins and added value and, in contrast, present a negative relationship with the financing cash flow and the debt ratio.

Based on this reasoning, Richardson et al. (2015) pointed out that, due to the degradation of their economic and financial situations, companies experiencing a high risk of bankruptcy may choose tax planning as an alternative, as the costs of these practices, such as penalties and damaged reputation would be considered minimal, compared to potential earnings. Thus, the authors above note that previous research highlights that, as bankruptcy costs are potentially high, companies tend to adopt more aggressive strategies from a tax point of view, despite the risk of being audited by the Treasury.

Added to these findings is the fact highlighted by Desai & Dharmapala (2006) about taxes representing a substantial cost for organizations and being an important aspect considered in managerial decisions regarding a company's finances. Such a fact is evidenced by tax planning practices, which are increasingly present in the corporate world. According to Chen et al. (2010), tax planning is a way to increase a company's cash flow, as well as those of its shareholders and executives, because it reduces the amount disbursed with taxes. Hence, tax planning is related to the companies' financial and economic issues and impacts at the same time that it is impacted by the decisions of companies facing financial distress, insolvency, or bankruptcy.

The studies on tax planning emphasize that some terminologies, such as tax avoidance, tax planning, and tax aggressiveness, are used in research on taxes to refer to the efforts of organizations to reduce or eliminate taxes. Hanlon and Heitzman (2010) state that there are no globally accepted concepts or constructs for tax avoidance but define it as a scale of tax planning activities, in which, on the one end, are the practices considered lawful and, on the other end, are the operations related to tax non-compliance, aggressiveness, or evasion.

It is also important to note that studies seek to highlight the factors determining a company's involvement in tax planning. Richardson, Taylor, and Lanis (2013) consider that some aspects – such as being audited by a Big Four company, implementing an efficient risk management and internal control system, and having an independent external auditor and an internal audit committee – are relevant in determining a company's degree of tax aggressiveness. Martinez and Ramalho (2017) argue that when a company is concerned with social sustainability, it tends to be less aggressive from a tax point of view.

In addition to the reasons affecting a company's decision to adopt tax strategies, the literature emphasizes the impacts caused by a search for minimizing or eliminating taxes in the corporate environment. For example, Richard et al. (2019) examined the effect of corporate tax planning on the financial performance of listed manufacturing companies in Nigeria. They identified that Nigerian industrial organizations have not been able to capitalize and take advantage of the loopholes enshrined in local tax laws, considering that a change in the Effective Tax Rate (ETR) leads to a decrease of 9.3% in the Return on Total Assets (ROA).

While tax planning strategies result in savings, they might simultaneously increase an organization's financial complexity. To the extent that this greater financial complexity cannot be adequately clarified through communications with third parties, such as investors and analysts, transparency issues may arise, such as analyst errors and a negative impact on earnings quality. Hence, it suggests that aggressive tax planning is associated with lower corporate transparency, possibly leading to higher capital costs (Balakrishnan et al., 2018).

In this context, tax planning was also related to bankruptcy and financial problems. Dhawan, Ma, and Kim (2020) report that the probability of bankruptcy increases as the adoption of tax planning practices increases. They state that this relationship aligns with previous research indicating that tax planning increases the cost of debt and the possibility of lowering bond ratings. Therefore, Dhawan, Ma, and Kim (2020) suggest that the negative assessments of banks and risk rating agencies for companies engaging in tax planning do not refer only to the idiosyncratic risk preferences of these entities but to the higher probability of bankruptcy among companies engaging in tax planning practices.

Finally, considering the understanding of Rezende et al. (2017) that the models adopted in the literature predict the insolvency of a company when it is no longer able to implement strategies to reverse this condition, this study aims to answer the following question: What is the impact of the level of tax practices on the probability of financial distress (understood here as an indication of bankruptcy) of non-financial companies listed on Brasil, Bolsa, Balcão (B3)? Therefore, the objective is to verify whether the level of tax practices changes a company's probability of dealing with financial distress.

Over the years, studies on tax planning have sought the determinants, measurement methods, reasons that lead managers to resort to tax practices, and the consequences of such practices on companies. However, studies investigating the relationship between tax strategies and corporate financial distress are still incipient in Brazil and the international context.

Hence, the relevance of this study lies in investigating whether the level of tax practices positively or negatively influences a company's situation, which according to Rezende et al. (2017) precedes bankruptcy. Considering the absence of universally accepted definitions in the literature for tax planning, this study conceptualizes all tax reduction strategies as tax practices.

Evidence found in this study suggests that tax practices influence a company's financial problems. It has been documented that the lower an organization's involvement in strategies that minimize taxes disbursement, the greater the probability of it being affected by financial distress.

2. Theoretical framework

2.1 Tax Practices

An analysis of the literature on the subject indicates that the corporate tax environment has reached a multinational scope. Technological advancement and globalization have led companies to change the way they operate in the market, enabling economic, political, and social integration on a global scale (Moraes et al., 2021). According to De Simone (2016), multinational companies find tax incentives to transfer taxable income from high-taxation jurisdictions to low-taxation ones. Thus, they strategically assess company transactions to reduce tax costs in their corporate environment.

Beck et al. (2014) state that tax planning is a phenomenon that occurs among companies worldwide and is an important factor in social crises, such as the ongoing sovereign debt case. Moraes et al. (2021) note that organizational restructuring and the migration of firms to other economic contexts can be considered tax-planning activities intended to decrease the tax burden resulting from the new globalized market relationships.

Moraes et al. (2021) aimed to analyze the effect of fiscal aggressiveness on corporate transparency in Brazilian publicly traded companies and verified that fiscal aggressiveness negatively influences corporate transparency; and that industry and commerce sectors, company size, leverage, and profitability positively impact information disclosure. According to Balakrishnan et al. (2018), the fact is that fiscal aggressiveness may affect corporate information transparency, making it more complex, which in turn may negatively impact a company's value, its cost of debt, and the possibility of downgrading securities, thus increasing the likelihood that such a company will face financial distress and even bankruptcy (Balakrishnan et al., 2018; Dhawan, Ma and Kim, 2020).

On the other hand, an environment permeated with financial innovations, market integration, and a complex tax regulatory framework sets precedents for companies to engage in more elaborate tax planning. In such a context, understanding how these variables interact with corporate decisions, influencing the company's results and, consequently, the lives of their shareholders, is paramount. At this point, a company's governance levels are believed to influence the relationship between incentives and tax planning considered aggressive (tax sheltering), which leads to a search for the role of both managers and those preparing tax information in this corporate tax environment (Desai & Dharmapala, 2006).

In this sense, studies show that companies highly committed to corporate social responsibility (CSR) have high tax expenditures arising from their activities and, consequently, low tax aggressiveness (Melo et al., 2020). According to such authors, there is a positive relationship with the ETR tax aggressiveness proxy, suggesting that adopting more or improved socially responsible practices is related to fewer tax aggressiveness practices. Based on this result, Melo et al. (2020) argue that companies that consider all organizational stakeholders generate their resources environmentally sustainably, care about human resources and the community, and tend to pay their fair share of due taxes.

The potential relationship between stock liquidity and tax aggressiveness was investigated in the Brazilian capital market, where the longitudinal effects of stock liquidity on the book-tax difference were assessed. As a result, a statistically significant and economically positive relationship was identified between the fiscal aggressiveness proxy and stock liquidity. These findings suggest that companies with less volatile shares, greater relative shares in B3 businesses, and lower trading costs tend to adopt more aggressive tax planning. Additionally, investors in an emerging capital market such as Brazil tend to sparingly disregard occasional increases in profits due to more aggressive tax practices, provided these might incur future losses (Prímola et al., 2021).

Despite the global trend of adopting tax practices, the relationship between such practices and companies facing financial problems, insolvency, or bankruptcy still requires investigations. As indicated by Dhawan, Ma, and Kim (2020), the probability of bankruptcy increases as tax-planning practices are increasingly adopted. However, based on Richardson, Taylor, and Lanis (2015), companies experiencing a high risk of bankruptcy may opt for tax planning to increase earnings, considering that the costs of such practices as penalties and damaged reputation become less relevant.

In this context, it is important to understand how the literature addresses financial distress to verify the possibility that tax practices have some impact on such events.

2.2 Financial Distress

Financial distress has been studied over the years and has proven to be relevant for several players in the business context. To Geng, Bose, and Chen (2015), if an organization engages in the preparation of a reliable forecast of financial distress, managers can preventively implement strategies to avoid serious effects resulting from it, and shareholders can assess the situation of profitability and adjust their investment portfolios to minimize losses related to the anticipated investment.

Companies facing financial distress will not necessarily go bankrupt; however, a significant and continuous decline in economic performance can determine bankruptcy, causing shareholders and creditors to incur considerable losses. Therefore, stakeholders should identify the factors that indicate financial difficulties to protect their interests (Habib, Costa, Huang, Bhuiyan & Sun, 2020).

Considering that speedy managerial actions are needed to deal with the financial restructuring of companies facing difficulties, Rezende et al. (2017) note that knowing whether such a situation is reversible is essential. Still, such is a typical event, considering that some solvent companies fell into this condition at some point in their trajectories.

Koh, Durand, Dai, and Chang (2015) argue that when a firm falls into financial distress, it needs to act immediately to control costs and increase efficiency. According to the authors above, changes in dividend policies or the company's capital structure are usually related to financial restructuring. In addition to these practices, tax planning is also an option for rebuilding the company. Richardson, Taylor, and Lanis (2015) point out that companies facing financial distress are encouraged to engage in more aggressive tax planning, as the benefits of tax activities outweigh the costs.

Corroborating the previous arguments, Martinez and da Silva (2018) highlighted that, in times of financial constraints, with increased difficulty in accessing traditional sources of financing, companies may use tax planning as an alternative to meet their needs. Therefore, they concluded that organizations facing financial problems use fiscal strategies to recover with the additional cash generated.

2.3 Crises

According to Barbosa (2017), the decreased financial capacity of the Brazilian government significantly reduced consumption and investment in 2015 and 2016. During that time, Brazil's country risk increased along with the interest rate and uncertainty. Complementing this information, Paula and Pires (2017, p.125) stated that after having an average growth rate of 4% per year from 2004 to 2013, the Brazilian economy retracted "abruptly from 2014, experiencing a strong and prolonged recession in 2015-2016, with a negative average GDP growth rate of 3.7%, accompanied by the deterioration of several social indicators".

Another time of uncertainty in the economy occurred with the COVID pandemic. At the end of 2019, several people were hospitalized with pneumonia in China. The reason was later discovered to be a new virus, the COVID-19 virus (2019-nCoV), which, according to Zhu et al. (2020), is the seventh type of this virus that can infect humans.

Consequently, social isolation was one of the main strategies adopted to prevent the virus dissemination, considerably impacting the world economy, with the sales and profitability of Brazilian companies dropping during the period (Amorim et al., 2022).

The literature relates economic instability to tax practices. Habib, Costa, Huang, Bhuiyan, and Sun (2020) emphasize that when companies face financial distress during a crisis, they tend to employ aggressive tax planning strategies to finance their activities with the amounts saved.

In line with this understanding, Richardson, Taylor, and Lanis (2015) verified in an empirical study that the level of involvement in tax practices aimed at reducing tax payments was positively impacted by financial difficulties and the 2008 global crisis.

3. Methodology

3.1 Study classification and sample

This descriptive study, with a quantitative approach, describes the relationship between tax practices and financial distress among Brazilian non-financial companies listed on B3 (Martins & Theóphilo, 2009).

Hence, using the Stata software, we analyzed data from non-financial companies listed on B3 from 2010 to 2020. Table 1 shows that financial entities were excluded due to differences in the way their financial reports are published, in addition to the fact that these entities differ regarding tax aspects (Freitas et al., 2020; Konstantaras & Siriopoulos, 2011; Martinez & da Silva, 2018; Martinez & Dalfior, 2015; Pindado et al., 2008; Theiss & Beuren, 2017). The period from 2010 to 2020 was chosen because it concerns the period after international accounting standards were adopted (Martinez, 2017). Additionally, companies with negative equity and missing observations were excluded, as these would compromise the statistical data analysis.

Table 1
Sampling

Sample	Initial	Exclusion	Final
Companies listed on the Thomson Reuters database	573		
Financial companies, funds, and others		254	
Companies with negative equity or that did not have data on all variables for at least one year		164	
Total			**155**

Source: developed by the authors.

3.2 Econometric approach

3.2.1 Test of difference between means for the study variables

In this study, it is relevant to verify the existence of statistically significant differences between the variables composing the study sample [BTD, GAAPETR, CURRENTETR, DIFETR, net working capital (CG), asset turnover (GIRO) and ratio between shareholders' equity and total liabilities (PLPT)], separated according to the existence or inexistence of financial distress. Establishing whether there are statistically significant differences between the companies facing/not facing financial distress is important because it enables statistical comparisons of these two groups of variables, supporting the application of inferential statistics.

To correctly apply the difference in means test requires verifying whether data meet the assumptions required (Siegel & Castellan Jr, 2006). In this sense, confirming whether data is normally distributed and if the sample data are matched or unmatched (dependence or independence) is important (Siegel & Castellan Jr, 2006).

The absence of normality determines the use of a non-parametric test. If a Gaussian distribution is found, a parametric test is required to treat data (Levine, Berenson & Stephan, 2005). Additionally, verifying whether data are independent is important to determine the use of unmatched data. In contrast, dependence determines the use of a test for matched data (Levine, Berenson & Stephan, 2005).

In this study, we verified the need to use a test for unmatched or independent data because the companies in the sample are classified as facing/not facing financial distress. This aspect determines that the companies are separated into two groups; hence, data are independent. The statistical literature presents Student's t-test and the Mann-Whitney test to verify differences between unmatched data. The first is a parametric test, and the second is a non-parametric test (Siegel & Castellan Jr, 2006). Both tests consider the null hypothesis of equality of means/medians, respectively (Siegel & Castellan Jr., 2006).

3.2.2 Econometric procedures – Logistic regression model

The assessment of the impact of tax practices on the probability of companies facing financial distress in this study is performed through logistic regression. This methodology is necessary because the financial distress response variable has a particular nature, as it is represented by a dichotomous dummy variable, which indicates whether a given company is facing financial distress.

A logistic regression model is an econometric approach showing the probability of a given event. It is analyzed through a set of regressors that may or may not be dichotomous. The characteristic of logistic regression models is the fact that the response variable is categorical (dichotomous), i.e., it assumes 1 (one) if the event of interest occurs and 0 (zero) otherwise (Greene, 2003).

Unlike a multiple linear regression model, in which estimators are obtained using the Ordinary Least Squares (OLS) estimation method, logistic regression has an estimation method obtained through the Maximum Likelihood Method (Wooldridge, 2010).

It is important to note that if there is a variation in time and space in the data under analysis, the logistic regression approach for panel data should be used. In this type of analysis, the econometric literature indicates three potential approaches: pooled logit, fixed effects, and random effects (Baltagi, 2005).

Verifying the feasibility of these approaches concerns the use of specific statistical tests. Thus, as proposed by Wooldridge (2010), the following tests must be verified before the logistic regression model is used in data analysis:

i) the overall fit of the logistic regression model is evaluated by the total proportion of correct classifications obtained by the estimated logit model. It is important to note that the Pseudo R2, which integrates the logistic regression model, is not considered an adequate measure of adjustment to support the adequacy of the proposed logit model;

ii) the global significance of the logistic regression model is given by the LR test, which, under the null hypothesis, assumes the global insignificance of the parameters obtained by the proposed logit regression model;

iii) the sensitivity and specificity show, respectively, the proportion of correct classifications obtained by the model regarding the event of interest (companies facing financial distress) and the proportion of correct classifications for the group classified as 0 (zero) (companies not facing financial distress);

iv) the ROC (Receiver Operating Characteristic) curve is a measure of the fit of the logistic regression model, corresponding to the area under the curve; values close to 1 (one) are expected to achieve a better fit of the proposed logistic regression model (Wooldridge, 2010).

Considering that this study's data are arranged in time and space, verifying the adequacy of the Pooled logit, Fixed Effects, and Random Effects models is necessary. The Hausman test is used to verify these approaches. This test's null hypothesis assumes the viability of the Logit Random Effects approach.

In this context, the following logistic regression model is proposed to answer the research problem addressed here:

$$DIF_{it} = \beta_1 GAATETR_{it} + \beta_2 BTD_{it} + \beta_3 CURRENTETR_{it} + \beta_4 DIFETR_{it} + \beta_5\, CG_{it} + \beta_6 GIRO_{it} + \beta_7 PLPT_{it} + \beta_8 CRISE_{it} + v_{it} + u_i$$

Where:

- DIF_{it}: financial distress;
- $GAAPETR_{it}$, BTD_{it}, $CURRENTETR_{it}$ and $DIFETR_{it}$: variables of interest – tax practices proxies;
- CG_{it}: net working capital – calculated by the difference between current assets and current liabilities divided by total assets;
- $GIRO_{it}$: asset turnover – calculated by the ratio between net income and total assets;
- $PLPT_{it}$: ratio between shareholders' equity and total liabilities;
- CRISE: dummy equals 1 (um) for 2015, 2016, and 2020 and 0 (zero) otherwise;
- v_{it}: model error term; and
- u_i: non-observed heterogeneity.

3.2.3 Definition of variables

3.2.3.1 Dependent variable

According to the Brazilian and international literature, the variables in this study were selected because they are related to financial distress.

The dependent variable Financial Distress (DF) is a dummy, which, according to Pindado et al. (2008), equals 1 (one) when earnings before interest and taxes, depreciation, and amortization (EBITDA) is less than financial expenses, along with a decrease in the company's market value in two consecutive periods, and 0 otherwise, as shown in Figure 1.

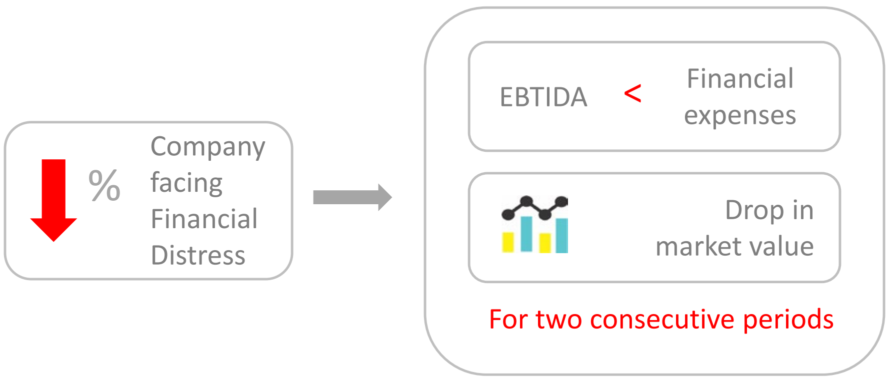


Figure 1. Companies facing Financial Distress

Source: adapted from Pindado et al. (2008) and Rezende et al. (2017).

3.2.3.2 Variable of Interest

The tax practices proxies (Table 2) were included in this study because the influence of tax planning on the companies' financial/economic aspects was verified by previous studies, such as Richard et al. (2019), Balakrishnan et al. (2018); Dhawan, Ma, and Kim (2020) and Richardson, Taylor, and Lanis (2015).

Table 2
Variables of Interest

Metrics	Operationalization	Expected relationship	Authors
GAAP ETR (Effective tax rate on profit)	$\frac{\textit{Total income tax expense}}{\textit{Earning before taxes}}$	The more aggressive the company, the lower the *GAAP ETR*.	Hanlon and Heitzman (2010); Martinez (2017); (Baderscher et al., 2013); Beladi et al. (2018); Cen et al. (2017); (Cen et al., 2019)
BTD	$\frac{\textit{Earnings before taxes - (Total income tax expense/0.34)}}{\textit{Total assets}}$	The more aggressive the company, the higher the *BTD*.	Cabello et. al. (2019)
CURRENT ETR	$\frac{\textit{Current expense with taxes on earnings}}{\textit{Earnings before taxes}}$	The more aggressive the company, the lower the *CURRENTETR*.	Chiachio & Martinez (2019)
DIFETR	$\frac{\textit{Deferred income tax expense}}{\textit{Earnings before taxes}}$	The more aggressive the company, the lower the *DIFETR*.	Chiachio & Martinez (2019)

Source: study's data, 2020.

3.2.3.3 Independent variables

The proxies in Table 3 are highlighted in the literature as financial variables that impact financial distress. Altman et al. (1979) and Sanvicente & Minardi (1998) adopted the Net Working Capital (GC) variable. The Asset Turnover (GIRO) variable was adopted by Altman et al. (1979) and Rezende et al. (2017); negative effects were reported by Altman et al. (1979), Sanvicente & Minardi (1998) and Rezende et al. (2017).

The Equity over Total Liabilities (PLPT) variable was adopted by Altman et al. (1979), Rezende et al. (2017), and Sanvicente & Minardi (1998). Sanvicente and Minardi (1998) found a positive effect of this variable in the model, and a negative effect was reported by Rezende et al. (2017).

The crisis proxy was included as a control variable because, according to Rezende et al. (2017), internal and global crises increased the probability of company insolvency in the Brazilian context. This Dummy variable assumes 1 in 2015, 2016, and 2020 and 0 otherwise.

Table 3
Metrics and Operationalization

Metrics	Operationalization	Expected Relationship	Authors
Net working capital (CG)	$CG=\frac{(AC\text{-}PC)}{Ativo\ total}$	(-)	Altman et al. (1979); Sanvicente and Minardi (1998); Rezende et al. (2017)
Asset turnover	$GIRO=\frac{Receita\ líquida}{Ativo\ total}$	(-)	Rezende et al. (2017) Altman et al. (1979).
Equity over total liabilities (PLPT)	$PLPT=\frac{Patrimônio\ líquido}{Passivo\ total}$	(-)	Altman et al. (1979); Sanvicente and Minardi (1998); Rezende et al. (2017)
Crisis	2014 crisis Considering its effects in 2015/2016: The Dummy variable equals "1" for the Covid-19 period, "1" in 2020, and "0" otherwise	(+)	(Andreoli, 2018; Barbosa, 2017; Richardson et al., 2015; Simão, 2017)

4. Results analysis and discussion

This section presents the results obtained with the application of the methodological procedures previously described.

4.1 Descriptive statistics of data

The outliers in this study were treated with the Winsorization technique. Figure 2 presents the box-plot graphs of the data under analysis.

Box-plot of the variables analyzed

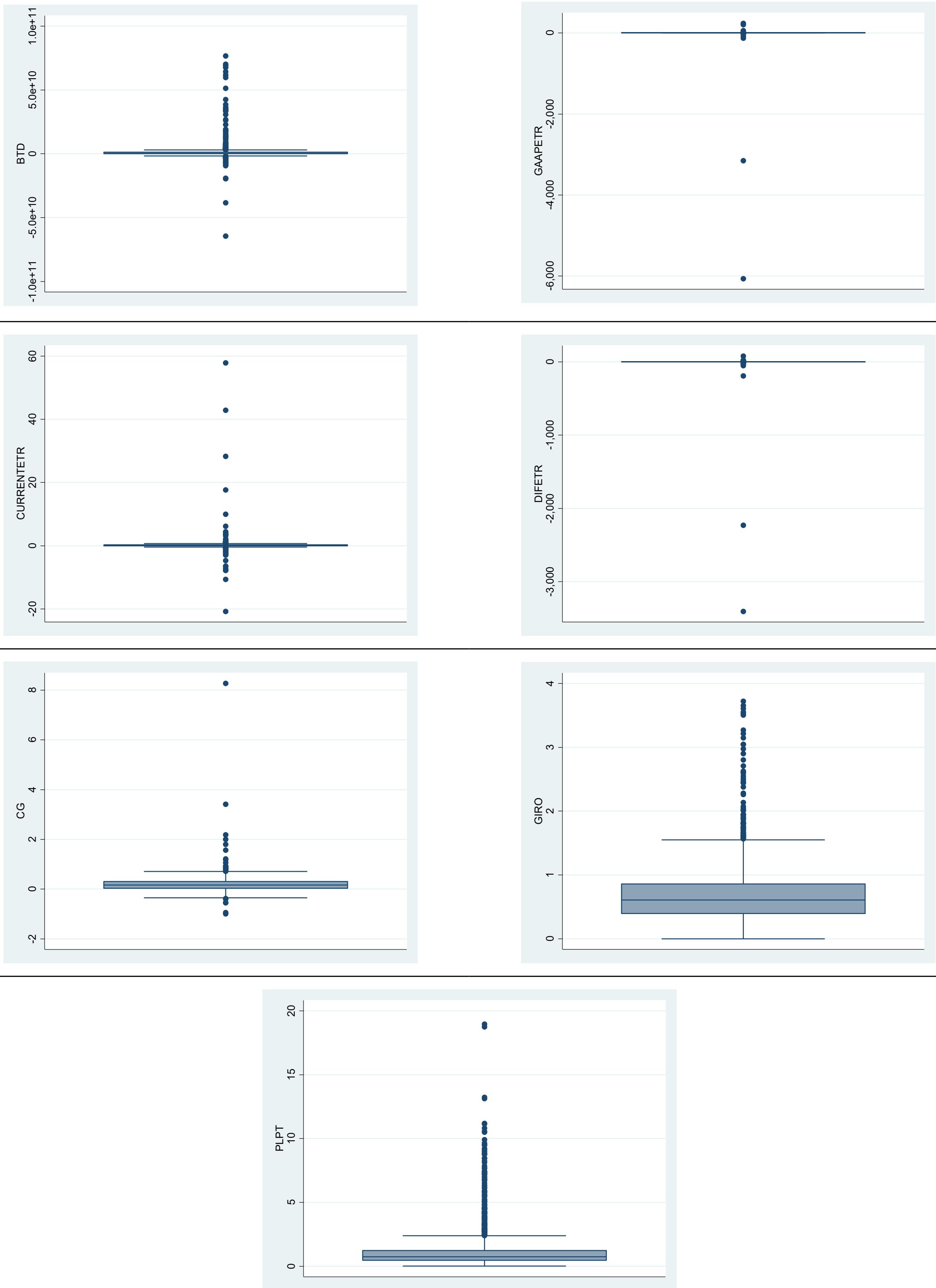


Figure 2. Box-plots of the regressors used in this study

Source: study's data.

The box-plot graphs show the presence of atypical observations; i.e., data do not come from sample measurement errors and, therefore, were not considered outliers. In this case, data need to be treated due to the presence of discrepant observations that may impair the estimation of the parameters of the econometric model proposed. Table 4 presents the descriptive statistics.

Table 4 presents the descriptive statistics.

Table 4
Descriptive Statistics

Group of companies facing financial distress							
STATISTICS	**BTD**	**GAAPETR**	**CURRENTETR**	**DIFETR**	**CG**	**GIRO**	**PLPT**
Median	-3344118	0.06	0.00	0.02	0.18	0.46	0.54
Mean	-699000000	-1.24	0.40	-2.16	0.26	0.65	1.24
Standard Deviation	6960000000	13.08	4.33	19.37	0.86	0.64	1.93
Minimum	-64500000000	-131.12	-7.83	-192.87	-0.94	0.00	0.003
Maximum	18000000000	11.51	42.86	8.46	8.28	3.61	13.22
Coefficient of Variation	996.24%	1051.18%	1089.83%	898.06%	326.13%	98.01%	154.88%
No.observations	102	102	102	102	102	102	102
Group of companies without financial distress							
STATISTICS	BTD	GAAPETR	CURRENTETR	DIFETR	CG	GIRO	PLPT
Median	360000000	0.23	0.15	0.01	0.16	0.62	0.74
Mean	1690000000	-7.40	0.21	-4.77	0.19	0.70	1.27
Standard Deviation	6850000000	200.68	2.19	119.44	0.24	0.48	1.79
Minimum	-38400000000	-6063.52	-20.77	-3406.01	-0.99	0.00	0.02
Maximum	76700000000	236.45	57.85	78.28	3.42	3.72	18.95
Coefficient of Variation	405.46%	2712.47%	1027.46%	2502.58%	126.21%	68.84%	140.88%
No.observations	1162	1162	1162	1162	1162	1162	1162
Mann Whitney Test of difference in means							
Z Statistics	7.0750***	5.0070***	5.1260***	-0.5840	-0.6350	2.9160***	.9040**

Notes: The tests' statistical significance is represented using the following: *10%; **5%; ***1%.

Source: study's data.

Table 4 shows high data variability regarding the variables' means, possibly explained by the sample's heterogeneity.

Table 4 presents the Mann-Whitney test of difference in means for the variables classifying according to the existence of financial distress. This test was used because data were not normally distributed.

Additionally, the statistical differences concerning the means are confirmed by the data description. In this sense, the variables: BTD, GAAPETR, CURRENTER, GIRO, and PLPT are statistically different regarding the existence of financial distress.

The results provide statistical evidence that the indicators (BTD, GAAPETR, CURRENTER, GIRO, and PLPT) of the companies facing financial distress are lower than those of companies not facing financial distress. The results concerning the variables of interest GAAPETR and CURRENTER are aligned with those reported by Chiachio & Martinez (2019), indicating that companies in a better financial situation present lower levels of tax aggressiveness. Thus, this finding also corroborates Richardson, Taylor, and Lanis (2015), in which companies facing financial problems tend to engage in more aggressive tax practices.

4.2 The regression logistic model estimated to treat data

Table 5 shows the Pooled and random effects logit models estimated for this study's data. Global significance evidenced by the LR test was verified for the Pooled logit model, in which the null hypothesis of the insignificance of the model's parameters was rejected. The goodness of fit test shows the adequacy of the model's adjustment and ROC curve equal to 67.44%. Finally, the sensitivity and specificity linked to the pooled logit model are 1.96% and 99.74%, respectively. The overall fit of the Pooled logit model is equal to 91.85%. The Random Effects logit model is validated using Rho statistics, which shows the importance of the logit panel for processing data. Failure to reject the null hypothesis of the Hausman Test indicates that random effects logit is appropriate.

Table 5
Logistic regression model for panel data – Random Effects

Logistic regression models				
	Pooled Logit		Random effects logit	
Variables	Marginal Effect	P-value	Coefficient	P-value
BTD	-1.0x10e-10***	0.0010	-1.18x10e-11***	0.0040
GAAPETR	0.0117	0.1750	0.0307**	0.0280
CURRENTETR	0.0071	0.8220	-0.0249	0.4740
DIFETR	-0.0165	0.1780	-0.0441**	0.0270
CG	0.4196**	0.0420	0.1819	0.5320
GIRO	-0.2433	0.3100	-0.1303	0.7640
PLPT	-0.0270	0.6550	-0.0044	0.9670
CRISE	0.1877	0.4310	0.4002	0.1590
CONS	-2.3272***	0.0000	-4.2444****	0.0000
Logit Model Validation Statistics				
No. of observations	1264		1264	
McFadden R^2	3.61%		_	
Sensitivity	1.96%		_	
Specificity	99.74%		_	
Model's fit	91.85%%		_	
Area under the ROC curve	67.44%		_	
LR Test	25.57***		_	
Goodness of fit	1177.67		_	
Rho	104.77 ***			
Hausman	_		7.48	

Notes: The tests' statistical significance is represented by the following: *10%; **5%; ***1%.

Source: study's data.

The Random Effects logit model results indicate a negative relationship between BTD and DIFETR and a positive relationship between GAAPETR and financial distress. Hence, the less a company engages in tax practices, the higher the probability of facing financial distress.

The analysis of results indicates a contrary association between the probability of financial distress and tax practices; i.e., such findings are opposed to evidence reported by Chiachio and Martinez (2019) and Richardson, Taylor, and Lanis (2015). Such studies suggest that the more aggressive the company is, the higher the probability of financial distress.

5. Final Considerations

The importance of estimating a company's bankruptcy risks in advance is indisputable. In such a context, financial distress is an opportunity to identify the onset of financial problems before companies enter into insolvency or even bankruptcy (*ex-ante*) (Konstantaras & Siriopoulos, 2011; Pindado et al., 2008). The great advantage is to allow companies to implement preventive actions before entering insolvency or bankruptcy, increasing the probability of reversing the situation.

Another point highlighted here is that tax planning has the potential to negatively affect a company's financial and economic situation. As highlighted by Balakrishnan et al. (2018), even though it saves tax expenses, it can simultaneously increase the financial complexity of an organization, increase the probability of bankruptcy and the cost of debt, besides the possibility of downgrading security ratings. However, the literature shows that companies dealing with an unfavorable financial and economic situation may opt for aggressive tax planning because the costs of such practices, like penalties and damaged reputation, might be considered minimal compared to potential gains.

This study achieved its primary objective, which was to verify whether the level of tax practices influences the probability of facing financial distress (understood here as an indication of a bankruptcy process) among non-financial companies listed in Brasil, Bolsa, Balcão (B3).

The tendency showed in the literature – that aggressive tax planning influences a company's probability of experiencing financial distress – was confirmed in this study. A statistically significant negative influence was found in the relationship between BTD and CURRENTETR, and a positive influence was found between GAAPETR and the probability of a company facing financial distress. These results align with previous studies such as Balakrishnan et al. (2018), Richard et al. (2019), and Richardson et al. (2015).

This finding suggests that companies should always assess the implementation of tax practices-related activities wisely, as the savings generated are considered a source of internal funds, even more so among companies dealing with financial difficulties, keeping in mind that the costs linked to such strategies can exacerbate a company's financial constraints.

An interesting finding is that the crisis in 2014/2015 and the pandemic did not significantly affect the probability of financial distress in the companies addressed here. This result is likely explained by how these crises affected these companies due to their idiosyncrasies.

The last aspect to highlight here is that the PLPT index did not significantly influence the probability of financial distress among the companies in this study's sample. This fact is possibly explained by the effects of the components of the items comprising this index, such as the level of cost of own capital and third-party capital, the liability structure such as the composition of terms (short and long term), and the characteristics of third-party capital origins (commercial banks vs. development banks).

One potential limitation is that other taxes that compose the results of Brazilian companies at the federal, state, and municipal levels are not captured by the measures of tax practices applied here.

The suggestion for future research includes assessing aspects that may have influenced the changes in the results, such as other elements of corporate governance, the Executives' characteristics, and macroeconomic components.

References

Altman, E. I., Baidya, T. K. N., & Dias, L. M. R. (1979). Previsão de problemas financeiros em empresas. *Revista de Administração de Empresas*, 19, 17–28. https://doi.org/10.1590/S0034-75901979000100002

Amorim, J. Q., Sales, G. A., & Grecco, M. C. P. (2022). Covid-19 e os impactos nas políticas de financiamento e investimento. *RAM. Revista de Administração Mackenzie*, *23* (2). https://doi.org/10.1590/1678-6971/eRAMF220225.pt

Andreoli, P. H. (2018). *Nível de transparência da remuneração executiva e comportamento da remuneração variável em períodos de estabilidade e crise econômica*. http://bibliotecadigital.fgv.br/dspace/handle/10438/24595

Baderscher, B. A., Katz, S. P., & Rego, S. O. (2013). The separation of ownership and control and corporate tax avoidance. *Journal of Accounting and Economics*, 56(2–3), 228–250. https://doi.org/10.1016/j.jacceco.2013.08.005

Balakrishnan, K., Blouin, J. L., & Guay, W. R. (2018). Tax Aggressiveness and Corporate Transparency. *The Accounting Review*, 94(1), 45–69. https://doi.org/10.2308/accr-52130.

Baltagi, B. H. (2005). *Econometric Analysis of Panel Data*. 3 ed. New York: John Wiley & Sons.

Barbosa, F. de H. (2017). A crise econômica de 2014/2017. *Estudos Avançados*, 31, 51–60. https://doi.org/10.1590/s0103-40142017.31890006

Beck, T., Lin, C., & Ma, Y. (2014). Why Do Firms Evade Taxes? The Role of Information Sharing and Financial Sector Outreach. *The Journal of Finance*, 69(2), 763–817. https://doi.org/10.1111/jofi.12123

Beladi, Hamid, Chao, C. C., & Hu, M. (2018). Does tax avoidance behavior affect bank loan contracts for Chinese listed firms? *International Review of Financial Analysis*, 58, 104–116. https://doi.org/10.1016/j.irfa.2018.03.016

Cabello, O. G., Gaio, L. E., & Watrin, C. (2019). Tax avoidance in management-owned firms: evidence from Brazil. *International Journal of Managerial Finance*, 15 (4), 580-592. https://doi.org/10.1108/IJMF-04-2018-0117

Cen, L., Maydew, E. L., Zhang, L., & Zuo, L. (2017). Customer–supplier relationships and corporate tax avoidance. *Journal of Financial Economics*, 123(2), 377–394. https://doi.org/10.1016/j.jfineco.2016.09.009

Cen, L., Maydew, E., Zhang, L., & Zuo, L. (2019). Tax planning diffusion, real effects, and sharing of benefits. 41.

Chen, S., Chen, X., Cheng, Q., & Shevlin, T. (2010). Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics*, *95*(1), 41-61.

Chiachio, V. F. de O., & Martinez, A. L. (2019). Efeitos do Modelo de Fleuriet e Índices de Liquidez na Agressividade Tributária. *Revista de Administração Contemporânea*, 23, 160–181. https://doi.org/10.1590/1982-7849rac2019180234

De Simone, L. (2016). Does a common set of accounting standards affect tax-motivated income shifting for multinational firms? *Journal of Accounting and Economics*, 61(1), 145–165. https://doi.org/10.1016/j.jacceco.2015.06.002

Desai, M. A., & Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics*, 79(1), 145–179. https://doi.org/10.1016/j.jfineco.2005.02.002

Dhawan, A., Ma, L., & Kim, M. H. (2020). Effect of corporate tax avoidance activities on firm bankruptcy risk. *Journal of Contemporary Accounting & Economics*, 16(2), 100187.

Freitas, M. R. D. O., Pereira, G. M., Vasconcelos, A. C. D., & Luca, M. M. M. D. (2020). Concentração Acionária, Conselho de Administração e Remuneração de Executivos. *Revista de Administração de Empresas*, 60, 322–335. https://doi.org/10.1590/S0034-759020200503

Geng, R., Bose, I., & Chen, X. (2015). Prediction of financial distress: An empirical study of listed Chinese companies using data mining. *European Journal of Operational Research*, 241(1), 236-247.

Greene, W. H. (2003). *Econometric analysis*. Pearson Education India.

Habib, A., Costa, M. D., Huang, H. J., Bhuiyan, M. B. U., & Sun, L. (2020). Determinants and consequences of financial distress: review of the empirical literature. *Accounting & Finance*, 60, 1023-1075.

Hanlon, M., & Heitzman, S. (2010). A review of tax research. *Journal of Accounting and Economics*, 50(2–3), 127–178. https://doi.org/10.1016/j.jacceco.2010.09.002

Koh, S., Durand, R. B., Dai, L., & Chang, M. (2015). Financial distress: Lifecycle and corporate restructuring. *Journal of Corporate Finance*, 33, 19-33. https://doi.org/10.1016/j.jcorpfin.2015.04.004

Konstantaras, K., & Siriopoulos, C. (2011). Estimating financial distress with a dynamic model: Evidence from family owned enterprises in a small open economy. Journal of Multinational Financial Management, 21(4), 239–255. https://doi.org/10.1016/j.mulfin.2011.04.001

Levine, D. M., Berenson, M. L., & Stephan, D. (2005). *Estatística: teoria e aplicações-usando Microsoft Excel português*. Ltc.

Martinez, A. L. (2017). Agressividade Tributária: Um Survey da Literatura. *Revista de Educação e Pesquisa em Contabilidade (REPeC)*, 11(0), 106–124. https://doi.org/10.17524/repec.v11i0.1724

Martinez, A. L., & Dalfior, M. D. (2015). *Agressividade Fiscal entre Companhias Controladoras e Controladas*. 20.

Martinez, A., & da Silva, R. (2018). Restrição financeira e agressividade fiscal nas empresas brasileiras de capital aberto. *Advances in Scientific and Applied Accounting*, 11(3), 448–463. https://doi.org/10.14392/ASAA.2018110305

Martinez, A. L., & Ramalho, V. P. (2017). Agressividade tributária e sustentabilidade empresarial no Brasil. *Revista Catarinense da Ciência Contábil*, *16*(49).

Martins, G. de A., & Theóphilo, C. R. (2009). *Metodologia da investigação científica para ciências sociais aplicadas*. Atlas.

Melo, L. Q. de, Moraes, G. S. de C., Souza, R. M. de, & Nascimento, E. M. (2020). A responsabilidade social corporativa afeta a agressividade fiscal das firmas? Evidências do mercado acionário brasileiro. *Revista Catarinense da Ciência Contábi*l, 19. https://doi.org/10.16930/2237-766220203019

Moraes, G. S. de C., Nascimento, E. M., Soares, S. V., & Prímola, B. F. L. (2021). Agressividade fiscal e evidenciação tributária: Um estudo das companhias brasileiras de capital aberto. *Contextus – Revista Contemporânea de Economia e Gestão*, 19, 197–216. https://doi.org/10.19094/contextus.2021.61612.

Myers, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, 39, (3), 575-592.

Paula, L. F. D., & Pires, M. (2017). Crise e perspectivas para a economia brasileira. *Estudos avançados*, *31*(89), 125-144. https://doi.org/10.1590/s0103-40142017.31890013

Pindado, J., Rodrigues, L., & La Torre, C. de. (2008). Estimating financial distress likelihood. *Journal of Business Research*, 61(9), 995–1003. https://doi.org/10.1016/j.jbusres.2007.10.006

Prímola, B. F. L., Nascimento, E. M., & Campos, O. V. (2021). Liquidez acionária e agressividade fiscal no mercado de capitais brasileiro. *Revista Catarinense da Ciência Contábil*, 20, e3188–e3188. https://doi.org/10.16930/2237-766220213188

Rezende, A. J., Dalmácio, F. Z., & Rathke, A. A. T. (2018). Avaliação do Impacto dos Incentivos Fiscais sobre os Retornos e as Políticas de Investimento e Financiamento das Empresas. *Revista Universo Contáil*, 14 (4). http://dx.doi.org/10.4270/ruc.2018426

Rezende, F. F., Montezano, R. M. D. S., Oliveira, F. N. D., & Lameira, V. D. J. (2017). Previsão de dificuldade financeira em empresas de capital aberto. *Revista Contabilidade & Finanças*, 28(75), 390-406.

Richard, D., Monday, E., & Ude, B., Emmanuel. (2019). The Impact of Corporate Tax Planning on Financial Performance of Listed Industrial Firms in Nigeria. 5(4), 12.

Richardson, G., Taylor, G., & Lanis, R. (2013). The impact of board of director oversight characteristics on corporate tax aggressiveness: An empirical analysis. *Journal of Accounting and Public Policy*, 32(3), 68-88. https://doi.org/10.1016/j.jaccpubpol.2013.02.004

Richardson, G., Taylor, G., & Lanis, R. (2015). The impact of financial distress on corporate tax avoidance spanning the global financial crisis: Evidence from Australia. *Economic Modelling*, 44, 44-53. https://doi.org/10.1016/j.econmod.2014.09.015

Sanvicente, A. Z., & Minardi, A. M. A. F. (1998). Identificação de indicadores contábeis significativos para previsão de concordata de empresas. *Instituto Brasileiro de Mercado de Capitais*, Working Paper12.

Siegel, S., & Castellan Jr, N. J. (2006). *Estatística não-paramétrica para ciências do comportamento*. Artmed Editora.

Simão, M. F. (2017). *Práticas de remuneração em período de crise econômica: Um estudo com empresas automotivas do Brasi*l. https://app.uff.br/riuff/handle/1/6414

Theiss, V., & Beuren, I. M. (2017). Estrutura de Propriedade e Remuneração dos Executivos. *Revista de Administração da Universidade Federal de Santa Maria*, 10(3), 533–550.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.

Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., ... & Tan, W. (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England journal of medicine*.

Round 1: Received in 06/15/2022. Review requested on 02/1º/2023. Round 2: Resubmited on 03/24/2023. Accepted on 04/17/2023 by Vinícius Gomes Martins, PhD (Editor assistant) and by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on XX/XX/23. Organization responsible for the journal: Abracicon

repec
Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting
ABRACICON
ACADEMIA BRASILEIRA DE CIÊNCIAS CONTÁBEIS

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, art. 4, p. 179-198, Apr./Jun. 2023 | DOI: http://dx.doi.org/10.17524/repec.v17i2.3245 | ISSN 1981-8610

Active transparency of the Public Ministry: from the perspective of information quality and availability

Rayane Vieira Rodrigues
https://orcid.org/0000-0003-4641-990X

Gabriela Boechat
https://orcid.org/0000-0003-1348-7260

Heloisa Coli
https://orcid.org/0000-0001-9812-5335

Marco Antonio Carvalho Teixeira
https://orcid.org/0000-0003-3298-8183

Abstract

Objective: This study aimed to analyze the active transparency of public prosecutor's offices at the state and federal levels, addressing a sample of institutional transparency websites and portals.

Method: Qualitative study and the development of an analytical instrument that considered provisions of the Law on Access to Information (LAI), resolutions, the guidelines of the National Council of the Public Ministry (*CNMP*), the Public Ministry's structural aspects, and the quality of information availability.

Results: a high level of compliance was found with the LAI's provisions, mainly related to budgetary matters. However, the Public Ministries failed to comply with most of the *CNMP*'s specifications, such as resolutions, and when they complied, these were not available in open data.

Contributions: This study's primary contribution consists of the instrument of analysis proposed here and which can be used to identify the level of transparency of the Brazilian Public Prosecutor's Office. Additionally, many observations concerning changes the *CNMP* can incorporate to improve transparency levels are presented here.

Keywords: Administrative Accountability. Control. Law of Access to Information. Public Ministry.

Published in Portuguese and English. Original Version in Portuguese.

Round 1: Received in 1/12/2023. Review requested 2/16/2023. Round 2: Resubmited on 3/16/2023. Review requested 4/11/2023. Round 3: Resubmited on 4/12/2023. Accepted on 4/14/2023 by Robson Zuccolotto, PhD (Editor assistant) and by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 6/30/2023. Organization responsible for the journal: Abracicon

1. Introduction

Accountability requires that public agents provide information and justify their actions before a forum that has the power to question and evaluate them and, if necessary, impose sanctions. In this context, transparency is a crucial element for adequate accountability, as it implies the obligation of public agents to provide information and records of their actions (Bovens, 2006; Schedler, 1999). The point of view usually analyzed in the literature is vertical or social accountability, which concerns the ability of members of civil society, such as ordinary citizens, stakeholders, charitable organizations, or other entities, to hold the State accountable for its actions (Bovens, 2006; O'Donnell, 1998). Transparency is also essential for the exercise of horizontal and administrative accountability though – i.e. when state institutions exercise control over other agents or independent state institutions and bodies external to the controlled organization (Bovens, 2006; O'Donnell, 1998) – which is increasingly necessary for a context of a highly bureaucratic state. Therefore, this study seeks to expand the analysis on transparency from this perspective, focusing on organizations in which members are not directly elected.

In Brazil, the Law on Access to Information – LAI (Law No. 12,527 from November 18th, 2011) is the primary legal framework regulating transparency and access to information, a fundamental right established by the Constitution. Bodies of the Executive and Legislative Powers are subordinated to the LAI, including Courts of Accounts, the Judiciary, and the Public Ministry. Much of the literature focuses on the Executive branch though. We understand that transparency is crucial for effective social and administrative accountability of democratic institutions such as Public Prosecution Offices, which, as representative organizations, must be subject to control; hence, this study's object of analysis. In other words, even though the Public Ministry is not composed of elected representatives, it must be subject to social and administrative control. The first control is verified from the society's perspective, and the second is mainly from the National Council of the Public Ministry (*CNMP*). In both cases, transparency is essential to be effectively implemented.

Focusing on active transparency, which comprises the regular and systematized dissemination of information, we analyzed a sample of institutional and transparency websites of Public Prosecution Offices in different regions of Brazil. The objective is to contribute not only to the analysis of the institution's compliance with the LAI but also to develop an instrument to collect information considering the resolutions issued by the *CNMP*, the structure of the Public Prosecution Offices, and what should be considered relevant when providing performance-related information via electronic means.

Standard cases were selected among those with similar and close to average institutional capacity, considering the number of members per 100,000 inhabitants, with one Public Ministry per region and the Federal Public Ministry. The following were selected for analysis: the Public Ministry of Amazonas, the Public Ministry of Goiás, the Public Ministry of Rio de Janeiro, the Public Ministry of Rio Grande do Sul, and the Public Ministry of Sergipe.

Note that the Public Prosecution Offices analyzed here obtained high indexes on more consolidated aspects of transparency, such as budget, personnel management, and certain LAI provisions. However, low indexes were obtained regarding *CNMP* resolutions and issues related to internal control bodies and collections of judicial and extrajudicial proceedings, in addition to the poor quality[1] **of the data provided**. Although the *CNMP* makes an effort to standardize the active transparency of Public Prosecution Offices, the cases analyzed here failed to comply with some aspects. The Council's assessment instrument, the *Transparentômetro* [Transparence meter], does not assess all resolutions issued. Hence, we emphasize the importance of the *CNMP* to include in its criteria aspects related to open and public data, including the availability of information about internal control bodies and the distribution of processes.

In addition to this introduction, this paper discusses transparency and accountability and the importance of more analyses on the transparency of institutions with non-directly elected members. The second section presents dichotomous classifications of transparency and quality aspects that must be considered when providing data and information in the public sector, the methodology adopted, and how the index proposed here was developed. The results are systematized in the third section, and the final considerations are presented in the last section.

2. Transparency and accountability

The term "transparency" originated in the principle of publicity – a concept used by the classics of liberal thought to name what they considered a normative characteristic of the liberal-democratic State. Kant (2008) pondered that norms, policies, and decisions that must remain secret to be effective would no longer be considered moral. Moreover, for Bentham (2011), publicity was a mechanism to prevent the abuse of authorities' political power. Therefore, publicity is established as a mechanism to contain arbitrariness, favoring the citizens' control and working as an interface between those making decisions and the population in general.

Current literature distinguishes between the notions of transparency and publicity. While the first captures the notion of transparency as accessibility to information, the second indicates that information is being communicated and delivered to the population (Lindstedt & Naurin, 2010). In other words, it is not sufficient to divulge information; a transparent institution allows external and internal actors to form their own opinion concerning the institution's actions and processes based on what is observed in the information available (Lindstedt & Naurin, 2010). Transparency, therefore, allows an organization to become crystal clear from the perspective of those receiving the information.

Access to information is considered a human right provided for in the Universal Declaration of Human Rights since 1948, linked to freedom of expression. Since 1990, several countries and intergovernmental organizations have recognized access to information as a fundamental right and instrument for strengthening democracy (Mendel, 2009). Mendel (2009) points out that, in the same period, the disclosure of information became part of treaties of international organizations and recommendations of development banks and international financial institutions. In this sense, access to information can encourage political representatives to make better choices and public decisions, keeping alive the idea of active citizenship present in Tocqueville (1977).

1 Quality aspects included the level of accessibility and usability of data, i.e., whether the structure of the available data ensures and facilitates understanding of the activity performed.

In political science and public administration, the notion of transparency is closely related to the concept of accountability. It constitutes a necessary, albeit not sufficient, aspect for realizing the latter (Bovens, 2006). According to Bovens (2006), the concept of accountability refers to the association between an actor and a forum, in which the agent is obliged to account for and justify his/her behavior. The forum can interrogate and evaluate him/her, which results in consequences for the actor. According to Schedler (1999), accountability has two crucial aspects: answerability, which requires public agents to provide information and justify their actions, and enforcement, which allows oversight bodies to impose sanctions on power holders who have violated their public duties. Based on these two definitions, it is evident that transparency is a crucial component of accountability, as agents must provide information and present records of their actions' outcomes and processes so that these can be evaluated (Bovens, 2006; Schedler, 1999).

The transparency of government acts is also a concept specific to democratic and republican governments, in which power must be exercised "without masks" (Bobbio, 2017; Sadek, 2010). From the point of view of institutional improvement, the availability of quality information is paramount to improve transparency (Michener & Bersch, 2013), in addition to mechanisms that allow internal control (Sadek, 2010) and the possibility of holding one liable if needed (Loureiro, Teixeira & Prado, 2008). As a result, democracy is qualified, and interactions between the State and society are strengthened (Cunha, 2019). Furthermore, it is an efficient strategy to stop corruption (Zuccolotto & Teixeira, 2019) and improves public policy performance (Rocha, 2011).

Bovens (2006) noted that transparency mechanisms are fundamental for exercising different types of accountability. Among them, three stand out as particularly relevant for the analysis in question: horizontal accountability, which is the control exercised by state institutions over other agents; vertical or social accountability, which refers to the control exercised by the people, stakeholders, charities, or other interested parties over the State (Bovens, 2006; O'Donnell, 1998); and administrative accountability, which consists of supervision and administrative and financial control conducted by independent and external entities or bodies (Bovens, 2006).

It is important to emphasize that even the institutions responsible for horizontal accountability must be subject to control and obliged to publicize their acts and the use of the public budget. Even though the literature on transparency mainly focuses on the Executive branch, all public entities and respective agents must assume such a responsibility. Regarding the second and third types, the importance of internal and external control bodies that oversee compliance with data transparency and can even punish institutions refusing to be transparent is highlighted. In this study, we highlight the importance of the *CNMP* in promoting administrative accountability and the institution's importance in controlling the active transparency of Public Ministries.

These issues become even more relevant in a highly bureaucratic State. Bureaucracy is a condition necessary to modernize society (Abrucio & Loureiro, 2018). However, it is also a risk to democracy, as part of public policy decisions is under the responsibility of bureaucrats, not elected by the people (Weber, 2015). The guarantee for unelected bureaucrats not to jeopardize democracy would be exercising their functions based on technical and non-partisan criteria. Since the second half of the 20th century, however, there has been an increased connection between public administration and the political world (Abrucio & Loureiro, 2018), i.e., a process of bureaucracy politicization. Based on a recognition that "bureaucracy in its various strata defends interests beyond merely technical decisions" (Abrucio & Loureiro, 2018, p. 30) and that bureaucrats decide the direction and design of public policies, it is possible to defend transparency as an accountability instrument in institutions formed by non-elected members, as is the case of institutions of the justice system.

For a long time, the literature on transparency only addressed budget transparency, and even then, it concerned the control performed over elected politicians. Zuccolotto, Teixeira, and Riccio (2015) show several analytical perspectives that can be adopted when dealing with the subject though. Nonetheless, in this paper, we propose changing the focus of analysis to include not only representative institutions or directly elected agents but also the Judiciary, the Public Ministry, autonomous and decentralized public entities, public foundations, government-owned companies, and mixed private-public ownership companies. These entities are often underrepresented in analyses addressing this topic in Brazil but are also subordinated to the LAI. In other words, we will treat transparency as the availability of information concerning government-owned institutions or any institution that actively uses public resources for internal or external actors (Grigorescu, 2003).

In Brazil, the Federal Constitution of 1988 – an instrument of the re-democratization process – inaugurated the commitment to policies of transparency and access to information by providing, among citizens' fundamental rights and guarantees, *the right to receive information from public bodies regarding their private, collective, or general interests within the term of the law, under penalty of liability, except for the information that compromises the security of society and the State* (art. 5, item XXXIII, of the FC), in addition to the provisions of art. 37, § 3, item II, and art. 216, § 2, both of FC. Since then, important legal frameworks have been published, such as the Fiscal Responsibility Law (Complementary Law No. 101/2000), which proposes to regulate public accounts (Sacramento & Pinho, 2008), and the LAI, which aims to impose accountability and transparency in fiscal management on the Executive, Legislative, and Judiciary branches, Audit Courts, direct administration bodies, as well as Public Prosecution Offices, pursuing the planning, control, accountability, and transparency principles (Motta, 2008).

More than 20 years after the Federal Constitution, the LAI was sanctioned, the primary legal framework for transparency that regulated this fundamental right in Brazil. Additionally, it recognizes access to information as the rule and secrecy of information as an exception, establishing a deadline for responding to requests for access to information and providing a minimum list of information that must be proactively made available (Bairral, Silva & Alves, 2015). The LAI is imposed on all government bodies, including those in the justice system, such as the Public Prosecution Office.

Despite the law's scope equally concerning the three Powers of the Republican Pact, the bodies of the Justice system are resistant to the advance of transparency. Although Constitutional Amendment No. 45, from 2004, was approved in a context where there was a perception that mechanisms were needed for the internal and external control of the institutions in the Justice system, monitoring according to Article 19, in 2013 and 2014 (Article 19, 2014; Article 19, 2015), shows that the bodies of the Public Ministry (Federal Public Ministry, Public Ministry of Labor, and CNMP) were among those with the worst performance compared to other bodies regarding the implementation of the LAI, in providing information both actively and passively. Moncau et al. (2015) also show the Brazilian Public Ministry's low-level response to information requests.

Cruz and Zuccolotto (2020) show that the Courts of Justice analyzed present relevant deficits in transparency obligations provided for by Resolutions of the National Council of Justice and a lack of open data. They also highlight the importance of "an effective transformation of historically bureaucratic institutions into democratic institutions" (p. 19).

Nevertheless, the National Councils of Justice and the Public Prosecutor's Office have issued resolutions and guidelines to ensure greater transparency in federal and state units. Thus, it is necessary to verify compliance with the LAI and the Justice system's internal provisions intended to coordinate and ensure uniform information disclosure, mainly on institutional websites and transparency portals. Therefore, it means analyzing and verifying a specific type of transparency, i.e., active transparency. The following section presents transparency classifications and the importance of having quality data and information available.

3. Dichotomous Transparency Classifications

As previously mentioned, transparency is linked to the concept of accountability. In addition to this connection, Stiglitz (2002) states that public transparency is a fundamental mechanism to exercise democracy fully, as it allows citizens to freely access and use public data, encouraging and enhancing participation and social control over the State's actions.

The greater the possibility of accessing information, the better society can monitor government functions, which enables demanding accountability from the State and encourages the government to improve the quality of expenditures and public services (Zuccolotto & Teixeira, 2019). Thus, the ability and willingness of bureaucratic apparatuses to disseminate relevant data on policies, including decisions, results, and processes, are essential for social control (Hollyer, Rosendorff & Vreeland, 2011).

In this sense, the literature presents some dichotomous classifications regarding transparency, such as general or specific, direct or indirect, and active or passive (Oliveira, 2020). Hood (2007) defines the concept of transparency into these first four distinct types: general or specific and direct or indirect. General transparency concerns a society where no one can be anonymous, and privacy is impractical. However, in specific transparency, there is a separation between public and private life; hence, transparency applies only to the former, that is, to governments, organizations, and public servants.

This analysis is part of the concept of specific transparency, which can also be separated into direct and indirect (Hood, 2007). Direct-specific transparency concerns actions or outcomes the general public can observe. Thus, bureaucrats and political agents are observed by society regarding public activities – whether through public meetings, availability of information on transparency portals, public documents, and others (Oliveira, 2020; Hood, 2007).

On the other hand, specific indirect transparency refers to information mechanisms or reports that show actions or outcomes to agents or technical specialists only (Oliveira, 2020; Hood, 2007). Thus, the focus is on governance methods, institutional procedures and processes, and decision-making rules. This concept provides that public managers must report technical information to central or audit departments, inspection, and classification bodies (Hood, 2007).

Still, in the classifications of the concept of transparency, there is an active and passive dichotomy. Active transparency consists of the periodic and systematic dissemination of information on the State management. Thus, it results from the voluntary actions of public managers or legal obligations imposed on State bodies, determining that necessary and sufficient information is published so that society can assess government performance (Zuccolotto, Teixeira & Riccio, 2015).

In turn, passive transparency refers to the State's obligation to grant all citizens who require timely access to official documents, except those that are legally protected for reasons of national security, public investigation, or third-party rights, etc. (Zuccolotto, Teixeira & Riccio, 2015). Thus, both active and passive transparency concepts refer to access to information, either by supply or demand. Following is a summary table of the transparency classifications identified thus far.

Classification	Description	Theoretical Reference
General or specific transparency	**General:** privacy is impractical for all citizens; **Specific:** public life is separated from private life; transparency only applies to governments, organizations, and public servants. **- Direct:** citizens observe actions or outcomes (public meetings, information available at transparency portals, etc.); **- Indirect:** reports and mechanisms that provide technical information to audit, inspecting, or classification departments.	Hood (2007)
Active or passive transparency	**Active:** voluntary or mandatory (via legal regulation) periodic and systematic report of information; **Passive:** information is provided to citizens upon request.	Zuccolotto, Teixeira & Riccio (2015)

Figure 1. Dichotomous Classifications of Transparency.

Source: Developed by the authors.

Given the previous discussion, the concepts of specific direct, specific indirect, and active transparency will guide the analysis of information provided by the Public Ministry online. Access to the information provided by bureaucratic entities has been transformed with the wide dissemination and use of information technology incorporated in Public Administration. Therefore, electronic government has become one of the primary means of promoting public transparency (Abdala & Torres, 2016). Hence, the active availability of public information on institutional websites and transparency portals allows for monitoring the use of public resources, as well as the actions of political representatives and bureaucrats (Ceolin, Almeida & Alves, 2016).

However, Gama and Rodrigues (2016) state that only the production and publication of information are insufficient to ensure transparency. Additionally, Vieira (2015) points out that the amount of information available does not necessarily represent quality information, as information must add value and generate knowledge. For this reason, citizens must be able to access, use, and understand the information available, and the information provided must communicate the real meaning it expresses to effectively promote transparency (Cruz, Silva & Santos, 2010). Therefore, here we consider how accessible and usable the information provided by the institutional websites and transparency portals of the Public Prosecution Offices is.

4. Active Transparency and the National Council of the Prosecutor's Office

The CNMP's resolutions and recommendations determine how the public prosecutors' transparency portals should be organized. The *Comissão de Controle Administrativo e Financeiro* (*CCAF*) [Commission for Administrative and Financial Control] verifies compliance with the LAI on the transparency portals of all Public Ministries. The results are published periodically by the *Transparentometer* program on the National Council's website. This platform analyzes transparency aspects related to i) budget and financial execution; ii) bids, contracts, and agreements; iii) personnel management; iv) strategic planning; v) paycheck; vi) core activities; vii) contact of bodies and members; and viii) passive transparency reports.

The main CNMP resolutions dealing with active transparency in Brazilian Public Ministries are Resolution No. 86, from March 21st, 2012, which establishes the Transparency Portal of the Public Prosecutor's Office and other measures; Resolution No. 110, from June 9th, 2014, which provides for the mandatory disclosure of the list of cases distributed to each member of the Public Ministry and institution's bodies; the disclosure of decisions issued by the collegiate bodies in the control of extrajudicial actions, given by Resolution No. 173, from July 4th, 2017; and Resolution No. 200, from July 10th, 2019, which determines the structure by which information regarding the breakdown of income of members and servants must be made available.

However, unlike the LAI, these resolutions do not consider issues of data quality and openness more broadly. Furthermore, although the *Transparentometer* is a vital mechanism implemented by the CNMP to verify and coordinate transparency matters, it does not consider essential issues raised in the index proposed here for calculating active transparency. These aspects mainly relate to the following: the collection of judicial proceedings, disclosure of data on extrajudicial and judicial proceedings, disclosure of justification for filing cases, any precedents or understandings consolidated by the Superior Councils, Colleges of Attorneys, or Coordination Chambers, and Review of the various branches of the Brazilian Public Prosecutor's Office, mandatory disclosure of lists with cases distributed to each member of the Public Ministry or the institution's body, and relevant information on ombudsman and internal affairs departments.

It is also essential to consider that, except for issues related to internal control bodies, all the other points are contained in resolutions of the CNMP itself but are not evaluated by the *CCAF*, which is much more focused on structural issues than on information about of the Public Prosecutor's Office. The transparency index on internal control bodies, collegiate bodies, internal affairs, and ombudspersons shows a lack of information about the institution's leading positions and the little control of society over the body's performance. As we will see, the index proposed in this study considers, in addition to the provisions of the LAI and CNMP resolutions, aspects of the institutional structure of the Public Prosecution Service which are highly relevant to exert control over the institution.

5. Methods

The institutional portals and transparency portals of the Public Ministries were analyzed, considering the variables based on aspects defined by the LAI, CNMP resolutions, institutional aspects of the structure and performance of the Public Ministry, and aspects of quality in the provision of information. It is important to note that the transparency portals are like a repository of information not necessarily available on the institutional portal, hence the differentiation between both. However, we chose not to be restricted to transparency portals, as institutional portals may also contain information about the variables analyzed.

Furthermore, we decided not to use previous methodologies to analyze active transparency, as the transparency assessment indexes are not designed for the structure of institutions in the justice system. The Public Ministry has its own design and specific functions; hence, it is necessary to analyze the portals in light of the context of their institutional structure. Also, data already made available by the *CNMP* portal based on the *Transparentômetro* project, were not used. Even though these have some aspects in common, the instrument used here adds relevant factors that deserve greater attention. On the other hand, the technical work prepared by the NGO Article 19 was considered an important reference to develop the form to collect data.

The following are the items considered in the analysis of active transparency in the Public Ministry's portals and the justifications for including each.

Dimensions Analyzed	Justification
Collection of extrajudicial processes	Resolution CNMP No. 173, from July 4th, 2017
Collection of court cases	Art. 16 CNMP Recommendation No. 58, from July 5th, 2017
Summaries or understandings consolidated by the Superior Councils, Colleges of Attorneys, or Coordination and Review Chambers of the various branches of the Brazilian Public Ministry	Resolution CNMP No. 173, from July 4th, 2017
Mandatory disclosure of the lists with the processes distributed to each member of the Public Prosecutor's Office or body of the institution, according to the criteria of the resolutions.	Resolution CNMP No. 110, from June 9th, 2014
Budget	Art. 8th, § 1st, items II, III, and IV, from LAI
Personnel management	Resolution CNMP No. 200, from July 10th, 2019
Internal Control Bodies	Based on the institutional design of the Public Ministry, on the Organic Law of the Public Ministry (Law No. 8,625, from February 12th, 1993), and on Constitutional Amendment No. 45/2004
Programs and Projects	Art. 8th, § 1st, item V, from LAI
List of declassified information made available in the last 12 months	Art. 30, item III, from LAI
List of documents classified in each degree of secrecy available, with identification for future reference	Art. 30, item III, from LAI
Institutional Information	Art. 8th, § 1st, item I, from LAI

Figure 2. Items analyzed and justification for their inclusion

Source: developed by the authors.

In this study, accessibility and usability of data are considered an aspect of quality, i.e., whether the information provided is structured and enables understanding of the body's activity. Based on this conception, the following quality dimensions were identified: i) the possibility of identifying all processes available without the need to conduct a specific search; ii) the possibility of searching for procedures according to the unit, member, police inquiries, issued recommendations or terms of adjustment of conduct; iii) information on extrajudicial procedures, the availability of procedures and actions in open data; iv) the possibility of downloading a database containing decisions and/or legal proceedings and actions; v) availability of budget execution on open data; vi) availability of statistical data in an open format on its performance and whether making inferences from the data available is possible; and vii) ease of access to information such as addresses, telephone numbers, and working hours.

Scores 0 (zero), 5 (five), and 10 (ten) were established for the cases in which the aspects were respectively not complied with, were partially complied with, and fully complied with, or only 0 (zero) and 10 (ten), depending on the item (see Annex A). Also, the same weight was considered for each item and sub-item. The following section presents the systematization and discussion of the results.

The quality dimensions were included as the LAI itself incorporates open data principles in its art. 8th, § 3rd, items II and III. Despite its importance, this is not the only way to measure quality since it is necessary to consider the accessibility of data and whether the information is usable or understandable.

Regarding the Internal Control Bodies dimension, information was analyzed on the General Internal Affairs of the Public Ministry, whose functions are provided for by the Organic Law of the Public Ministry (Law No. 8.625, from February 12th, 1993), and Ombudspersons, foreseen by the Constitutional Amendment No. 45/2004. The internal affairs offices play important roles, guiding and supervising the functional activities and the conduct of the Public Prosecutor's Office members. The Ombudspersons' Offices are responsible for receiving complaints and accusations against members or bodies of the Public Prosecutor's Office. Hence, they are essential bodies for the administrative control of the Public Ministry, for the representation of the *CNMP* in the states, and, consequently, for internal and administrative control; therefore, information transparency is essential.

For the analysis of cases, a Public Prosecutor's Office was selected per region based on the number of members per 100,000 inhabitants. This measure was considered a proxy for state capacity. Here we understand state capacity as an essential organizational structure for governments to fulfill their tasks (Evans, Rueschmeyer & Skocpol, 1985) and the domain of technical and administrative attributes mobilized for state action (Grin, Demarco & Abrucio, 2021). Therefore, the number of members mirrors the Public Ministry's administrative capacity – i.e., in addition to having technical knowledge, its members are responsible for performing a critical portion of these organizations' attributions. Also, the number of members per inhabitant measures the capacity to serve the population and deal with social demands. Based on data available from the *CNMP*, we selected the Public Ministries with a number of members per 100,000 inhabitants closest to the overall average (CNMP, 2022). Additionally, the Federal Public Ministry (FPM) was included.

Thus, we selected typical cases based on the typology of case studies performed by Gerring (2008), that is, similar examples in terms of state capacity, making it possible to perform a preliminary analysis more representative of PMs' transparency level. Thus, in addition to the FPM, the Public Ministry of Amazonas (MPAM), the Public Ministry of Goiás (MPGO), the Public Ministry of Rio de Janeiro (MPRJ), the Public Ministry of Rio Grande do Sul (MPRS), and the Public Ministry of Sergipe (MPSE) were selected.

6. Systematization of Results

The results of the analysis of active transparency on the institutional websites and the transparency portals of the State Public Ministries and FPM indicate the heterogeneity of this aspect in the institution, even between units that present similar administrative conditions and significant differences between the items analyzed. A large discrepancy is found based on transparency in the collection of judicial and extrajudicial processes and mandatory disclosure, as shown in the table below:

Table 1
Portal transparency index[2]

Item	MPAM	MPGO	MPRJ	MPRS	MPSE	FPM	Mean
Collection of extrajudicial processes	6.1	5.6	5	6.7	5.6	5.6	5.7
Collection of court cases	0	0	0	2.5	0	7.5	1.7
Summaries or understandings consolidated by the Superior Councils, Colleges of Attorneys, or Coordination and Review Chambers of the various branches of the Brazilian Public Ministry	0	10	10	10	0	0	5
Mandatory disclosure of the lists with the processes distributed to each member of the Public Prosecutor's Office or body of the institution, according to the criteria of the resolutions.	0	0	0	10	0	0	1.7
Budget	10	10	10	10	10	10	10
Personnel management	10	10	10	10	5	10	9.2
Internal Control Bodies	4	4	4	2	4	2	3.3
Programs and Projects	6.7	6.7	6.7	3.3	10	10	7.2
List of declassified information made available in the last 12 months	10	10	10	10	10	10	10
List of documents classified in each degree of secrecy available, with identification for future reference	10	10	10	10	10	10	10
Institutional Information	10	10	7.5	10	5	10	8.8
Quality	3.3	3.8	2.9	3.3	4.6	6.3	4
Overall mean	6.1	6.9	6.7	7.7	5.4	6.8	6.6

Source: developed by the authors.

Regarding extrajudicial action, the most significant difficulty of access is found in archived processes with justification. Regarding data quality, the absence of open databases hinders broader analyzes of the institution's performance. Regarding judicial action, data, in general, are not available on the institution's website, and when they are available, the information is incomplete or not in open data. Some websites direct the search for judicial proceedings to court websites; however, we do not consider this solution to be satisfactory since *CNMP* Resolution No. 58 from July 5th, 2017, is quite clear:

> Art. 16. except for cases of secrecy, all judicial decisions granted and actions filed by the Public Prosecutor's Office must be disclosed, clarifying whether they are injunctions, subject to appeal, or definitive.

Still, the *MPRJ* and the FPM were the only ones to present a collection of lawsuits, even though the former did not meet any quality criteria. The completeness and quality of information are essential for understanding the context and scope of the organization›s activities - which, in turn, is essential for horizontal and vertical accountability since extrajudicial and judicial instruments are of great importance in the Public Prosecutor›s Office performance, mainly in the control it performs of public administration (Rodrigues & Oliveira, 2022).

The publication of precedents and other consolidated understandings, whose obligation is foreseen in the CNMP Resolution No. 173, from July 4th, 2017, is carried out by three of the bodies analyzed (MPGO, MPRJ, and MPRS), while the dissemination of processes distributed for each member of the Public Ministry, provided for in the CNMP Resolution No. 110, from June 9th, 2014, is performed by just one institution (MPRS).

2 Annex B presents the values according to sub-item.

The disclosure of budgets is highlighted and obtained the maximum index in all the Public Ministries analyzed, both in the mandatory dimensions and in the quality dimension. A potential explanation is that the topic stands out, and public opinion is mobilized regarding resource allocation. This topic is precisely related to the first phase of consolidation of the relevance of transparency as of Complementary Law No. 131/2009, which focuses on budgetary issues. Regarding personnel management, a high level of compliance was found regarding the items considered in the analysis.

The transparency index on internal control bodies, collegiate bodies, internal affairs, and ombudsperson offices shows the lack of information on the institution's leading positions and the little control of society regarding the body's performance. Such a situation contrasts with the theme of programs and projects, on which there is a controlled availability of information and poor data quality.

All institutions published updated declassified and classified data, provided for by art. 30, item III, of the LAI, showing excellent compliance with this device. As for the availability of institutional information provided for in art. 8th, § 1st, item I, of the LAI, most institutions provide good quality information.

Note that all items scoring above 7 and all those that obtained the highest index were expected; that is, the best-assessed items in the active transparency are derived from the LAI devices, except for the personnel management item, which scored 9.2. This qualification is opposed to the subjects regulated by the *CNMP*, such as the availability of judicial processes performed by the institution and the disclosure of processes distributed by members, which obtain, in both cases, an index equal to 1.7.

There is a noticeable asymmetry of transparency between the items related to the requirements foreseen by the LAI and the norms of the *CNMP*. Such asymmetry may be related to the Board's ineffective controlling instruments and the difficulty exercising administrative accountability. Deficiencies were identified in the *Transparentometer*, which does not consider essential dimensions to measure the transparency of Public Prosecutions, giving a barely apparent sensation of high-quality active transparency. The difficulty for the *CNMP* to exercise external control and enforcement over the Public Ministry is not new in the literature, as highlighted by Kerche, Oliveira, and Couto (2020); the institutional design of the Council favors the independence of the Public Ministry rather than accountability.

7. Final Considerations

This study aimed to assess the institutional and transparency portals of the Federal Public Ministry and the Public Ministry of Amazonas, Goiás, Rio de Janeiro, Rio Grande do Sul, and Sergipe. Future research may expand the analyses to all Federal and State Public Ministry units.

Comparison between our results with those released by the *CNMP* through the *Transparentometer* reveals significant disparities. The items observed by the Board's analysis are mainly related to budgetary matters, personnel management, processes, and procedures; however, they do not consider the openness of data or the existence of a collection of lawsuits.

The worst results obtained in the index presented here are because the institutions do not adopt open data or only occasionally; the material would be more accessible and usable if data were open. Although the dimension concerning the comprehension of data on the part of citizens was not considered, except item 11.3[3]Data quality must be considered in any analysis of active or passive transparency since the mere availability of information is insufficient to ensure transparency.

3 Is information such as addresses, telephone numbers, and opening hours easily accessible?

It is also important to note that, although they follow the layout defined by the *CNMP* for transparency portals, the Public Prosecutions Offices analyzed do not fully follow other resolutions that define the availability of a collection of extrajudicial and judicial processes, precedents, and understandings consolidated by the internal control bodies, and process distribution list. In the cases such norms are complied with, data are not open and do not present quality of availability according to the criteria defined in the collection instrument.

Although the CNMP showed some interest in coordinating active transparency on the websites of the Public Ministry, it is possible that, among the cases analyzed, this was not effective in all aspects. Furthermore, despite resolutions on the subject, the body does not consider the dimensions of quality and openness of data. This matter deserves more attention from the CNMP and the Public Ministry under analysis. The lack of information about the internal control bodies and the distribution of processes stands out. This information is highly relevant for exercising control over the Public Prosecutor's Office but has been incompletely disclosed.

Even though it was not the focus of this study, future studies are suggested to analyze other means of communication, as these are also important to understand, for example, how Public Prosecutors use social media to provide information to the public. Viegas et al. (2022) performed this analysis for the case of the Federal Public Ministry and identified that, despite the intense use of social media as a form of communication, greater participation in digital media did not confer greater public accountability or organizational transparency. Hence, the use of digital media does not ensure greater quality of active transparency on the institutional websites of the Public Ministry analyzed.

Finally, we emphasize the importance of advancing studies examining the comprehensibility of published information beyond Public Prosecutions Offices to contribute to the literature on transparency. Additionally, future studies can deepen the qualitative analysis of available information, expand the cases analyzed to all Public Ministries, and integrate the proposed index with the one already prepared by the CNMP and its capacity to perform accountability. Carrying out studies seeking to identify the reasons for the different levels of transparency in the state Public Ministries is also relevant.

References

Abdala, P. R. Z., & Oliveira, C. M. S. (2016). A Transparência como Espetáculo: uma análise dos portais de transparência de estados brasileiros. *Administração Pública e Gestão Social*, 1(3), 147-158. https://doi.org/10.21118/apgs.v1i3.4900

Abrucio, F. L., & Loureiro, M. R. (2018). Burocracia e ordem democrática: desafios contemporâneos e experiência brasileira. In: R. Pires, G.Lotta e V. E. Oliveira (ORGSrg.). *Burocracia e políticas públicas no Brasil*, Brasília, DF: IPEA/ENAP.

Artigo 19 (2016). *Caminhos da Transparência* [livro eletrônico]: a Lei de acesso **à** informação e os tribunais de justiça / [supervisora Paula Martins]. - São Paulo: Artigo 19 Brasil.

Artigo 19 (2015). Relatório de monitoramento sobre implementação da LAI em 2014. São Paulo: Artigo 19 Brasil. Recuperado de: http://artigo19.org/wp-content/uploads/2015/05/Monitoramento-da-Lei-de-Acesso-%C3%80-Informa%C3%A7%C3%A3o-P%C3%BAblica-em-2014.pdf

Artigo 19 (2014). Relatório de monitoramento sobre implementação da LAI em 2013. São Paulo: Artigo 19 Brasil, 2014. Recuperado de: http://artigo19.org/wp-content/blogs.dir/24/files/2014/05/Relat%C3%B3rio-Monitoramento-LAI-2013.pdf

Bairral, M. A. da C., Silva, A. H. C. e ., & Alves, F. J. dos S.. (2015). Transparência no setor público: uma análise dos relatórios de gestão anuais de entidades públicas federais no ano de 2010. Revista De Administração Pública, 49(Rev. Adm. Pública, 2015 49(3)), 643–675. https://doi.org/10.1590/0034-7612125158

Bentham, J. (2011). Da publicidade. Revista Brasileira De Ciência Política, (6), 277–294. Recuperado de https://periodicos.unb.br/index.php/rbcp/article/view/1886

Bobbio, N. (2017). *O futuro da democracia; uma defesa das regras do jogo.* Tradução de Marco Aurélio Nogueira. Rio de Janeiro: Paz e Terra.

Bovens, M. (2007). Analysing and assessing accountability: A conceptual framework 1. *European Law Journal*, 13(4), 447-468. https://doi.org/10.1111/j.1468-0386.2007.00378.x

Brasil. [Constituição (1988)]. *Constituição da República Federativa do Brasil: promulgada em 5 de outubro de 1988.*

Brasil. [Constituição (1988)]. *Lei complementar n.º 101, de 4 de maio de 2000*. Estabelece normas de finanças públicas voltadas para a responsabilidade na gestão fiscal e dá outras providências.

Brasil. [Constituição (1988)]. *Lei n.º 12.527, de 18 de novembro de 2011*. Regula o acesso a informações previsto no inciso XXXIII do art. 5º, no inciso II do § 3º do art. 37 e no § 2º do art. 216 da Constituição Federal; altera a Lei n.º 8.112, de 11 de dezembro de 1990; revoga a Lei n.º 11.111, de 5 de maio de 2005, e dispositivos da Lei n.º 8.159, de 8 de janeiro de 1991; e dá outras providências.

Ceolin, A. C., Almeida, J. A. C., & Alves, M. D. C. M. (2016). Portal da Transparência e o acesso **à** informação: um estudo do portal da transparência e o controle social em três municípios do estado de Pernambuco. *Desenvolvimento Socioeconômico em Debate*, 1(2), 42-59. https://doi.org/10.18616/rdsd.v1i2.2396

CNMP (Conselho Nacional do Ministério Público) (2022). *Ministério Público: um retrato*. Recuperado de: https://cnmp.mp.br/portal/relatoriosbi/mp-um-retrato-2020

2017). *Recomendação n.º 58, de 5 de julho de 2017*. Estabelece a Política Nacional de Comunicação Social do Ministério Público brasileiro.

CNMP (Conselho Nacional do Ministério Público) (2014*). Resolução n.º 110, de 09 de junho de 2014*. Dispõe sobre a divulgação obrigatória das listas com os processos distribuídos a cada membro do Ministério Público ou **órgão** da instituição.

CNMP (Conselho Nacional do Ministério Público) (2017*). Resolução n.º 173, de 4 de julho de 2017*. Dispõe sobre a publicação das decisões proferidas pelos **órgãos** colegiados do Ministério Público atribuídos do controle da atuação extrajudicial finalística.

CNMP (Conselho Nacional do Ministério Público) (2019*). Resolução n.º 200, de 10 de julho de 2019*. Altera o Anexo I da Resolução CNMP n.º 89, de 28 de agosto de 2012, que regulamenta a Lei de Acesso **à** Informação (Lei n.º 12.527, de 18 de novembro de 2011) no **âmbito** do Ministério Público da União e dos Estados e dá outras providências.

CNMP (Conselho Nacional do Ministério Público) (2016*). Manual do Portal da Transparência do Ministério Público/ Conselho Nacional do Ministério Público*. 4. ed. Brasília, DF: CNMP.

Cruz, C. F., Silva, L. M., & Santos, R. (2010). Transparência da gestão fiscal: um estudo a partir dos portais eletrônicos dos maiores municípios do Estado do Rio de Janeiro. *Contabilidade Gestão e Governança*, 12(3). Recuperado de https://revistacgg.org/index.php/contabil/article/view/86

Cruz, G. J. L., & Zuccolotto, R. (2020). Transparência ativa no Judiciário: um estudo dos portais eletrônicos dos Tribunais de Justiça. *Cadernos Gestão Pública e Cidadania*, 25(82). https://doi.org/10.12660/cgpc.v25n82.80149

Cunha, M. C., Filho (2019). A construção da transparência no Brasil: análise da elaboração e implementação da Lei de Acesso a Informação no Executivo Federal (2003-2019). (Tese de Doutorado) Universidade de Brasília, Distrito Federal, Brasil.

Evans, P. B., Rueschemeyer, D. & Skocpol, T. (1985) "On the road toward a more adequate understanding of the state". In Evans, Peter B., Rueschemeyer, Dietrich & Skocpol, Theda. *Bringing the State Back In*. Cambridge: Cambridge University Press.

Gama, J. R., & Rodrigues, G. M. (2016). Perspectivas e Desafios na Transparência das Contas Públicas: um estudo numa Instituição de Ensino Superior brasileira. *Encontros Bibli: Revista Eletrônica de Biblioteconomia e Ciência da Informação*, 21(45), 2-20. https://doi.org/10.5007/1518-2924.2016v21n45p2.

Gerring, J. (2008). Case selection for case-study analysis: Qualitative and quantitative techniques. In: J. M. Box-Steffensmeier, H. E. Brady & D. Collier (eds) The Oxford Handbook of Political Methodology. Oxford: Oxford University Press.

Grin, E. J., Demarco, D. J., & Abrucio, F. L. (2021). *Capacidades estatais municipais: o universo desconhecido no federalismo brasileiro* [recurso eletrônico] / organizadores Eduardo José Grin, Diogo Joel Demarco [e] Fernando Luiz Abrucio. – Porto Alegre: Editora da UFRGS/CEGOV, 2021. 714 p.: pdf

Grigorescu, A. (2003). International organizations and government transparency: Linking the international and domestic realms. *International Studies Quarterly*, 47(4), 643-667. http://www.jstor.org/stable/3693639

Hollyer, J. R., Rosendorff, B. P., & Vreeland, J. R. (2011). Democracy and transparency. *The Journal of Politics*, 73(4), 1191-1205. Hollyer, J. R., Rosendorff, B. P., & Vreeland, J. R. (2011). Democracy and transparency. Journal of Politics, 73(4), 1191-1205. https://doi.org/10.1017/S0022381611000880

Hood, C. (2007). What happens when transparency meets blame-avoidance?. *Public Management Review*, 9(2), 191-210. https://doi.org/10.1080/14719030701340275

Kant, I. (2008). *A Paz perpétua*. Tradução de Marco Zingano. Porto Alegre: L&PM.

Kerche, F., Oliveira, V. E. de, & Couto, C. G. (2020). Os Conselhos Nacionais de Justiça e do Ministério Público no Brasil: instrumentos de accountability?. *Revista De Administração Pública*, *54*(5), 1334–1360. Recuperado de https://bibliotecadigital.fgv.br/ojs/index.php/rap/article/view/82214

Lindstedt, C., & Naurin, D. (2010). Transparency is not enough: Making transparency effective in reducing corruption. *International Political Science Review*, *31*(3), 301-322. http://www.jstor.org/stable/25703868

Loureiro, M. R., Teixeira, M. A. C., & Prado, O. (2008). Construção de instituições democráticas no Brasil contemporâneo: transparência das contas públicas. *Organizações & Sociedade*, 15(47), 107-119. https://doi.org/10.1590/S1984-92302008000400006

Mendel, T. (2009). *Liberdade de Informação: Um Estudo de Direito Comparado* (2ª ed.). Brasília: UNESCO.

Michener, G., & Bersch, K. (2013). Identifying transparency. *Information Polity*, 18(3), 233-242 DOI: 10.3233/IP-130299

Moncau, L., Michener, G., Barros, M., & Velasco, R. B. (2015). *Avaliação de transparência do Ministério Público*. Rio de Janeiro: Escola de Direito do Rio de Janeiro da Fundação Getulio Vargas.

Motta, F. (2008). Notas sobre publicidade e transparência na lei de responsabilidade fiscal. *Revista Eletrônica de Direito do Estado*, 7(30). http://dx.doi.org/10.21056/aec.v7i30.638

O'Donnell, G. (1998). Accountability horizontal e novas poliarquias. *Lua nova: Revista de Cultura e Política (44)*, 27-54. https://doi.org/10.1590/S0102-64451998000200003

Oliveira, D. J. S. (2020). *Governo Aberto: Análise de Políticas Públicas sob os princípios de transparência, participação e colaboração*. (Tese de doutorado) - Universidade Federal de Minas Gerais, Brasil.

Rocha, A. C. (2011). Accountability na administração pública: modelos teóricos e abordagens. *Contabilidade Gestão e Governança*, 14(2). Recuperado de https://revistacgg.org/index.php/contabil/article/view/314

Rodrigues, R. V., & Oliveira, V. E. D. (2022). Ministério Público, judicialização e atuação extrajudicial em saúde. *Revista Direito GV*, 18(3). https://bibliotecadigital.fgv.br/ojs/index.php/revdireitogv/article/view/88400

Sacramento, A. R. S., & Pinho, J. A. G. (2008). Transparência na Administração Pública: O que mudou depois da Lei de Responsabilidade Fiscal? Um Estudo Exploratório em Seis Municípios da Região Metropolitana de Salvador. *Revista De Contabilidade Da UFBA*, *1*(1), 48–61. https://doi.org/10.9771/rcufba.v1i1.2579

Sadek, M.T., org. (2010). *Reforma do judiciário [online]*. Rio de Janeiro: Centro Edelstein de Pesquisas Sociais, 164 p. ISBN: 978-85-7982-033-5.

Stiglitz, J. (2002). *Transparency in Government*. In: R. Islam (Ed.). The Right to Tell: The Role of the Mass Media in Economic Development. Washington: World Bank Institute.

Schedler, A. (1999). Conceptualizing accountability. In: A. Schedler, L. Diamond, & M. F. Plattner (Eds.). *The self-restraing state. Power and accountability in new democracies*. London: Lynne Rienner Pub

Tocqueville, A. (1977). *A democracia na América*. Belo Horizonte: Itatiaia.

Viegas, R. R., Abrucio, F. L., Loureiro, M. R. G., Teixeira, M. A. C., & Borali, N. (2022). A comunicação dos Tribunais de Contas e Ministérios Públicos nas redes sociais: os desafios da accountability na democracia digital. *Revista de Administração Pública*, 56(3), 324-348. https://doi.org/10.1590/0034-761220210320

Vieira, P. R. (2015). *Avaliação da qualidade da informação em sistemas de informações estratégicas voltados ao judiciário brasileiro* (Dissertação de Mestrado.) Universidade Federal de Santa Catarina, Brasil.

Weber, M. (2015). *Ciência e política: duas vocações*. São Paulo: Martin Claret.

Zuccolotto, R., & Teixeira, M. A. C. (2019). *Transparência: aspectos conceituais e avanços no contexto brasileiro*. Brasília: Enap.

Zuccolotto, R., Teixeira, M. A. C., & Riccio, E. L. (2015). Transparência: reposicionando o debate. *Revista Contemporânea de Contabilidade*, 12(25), 137-158. https://doi.org/10.5007/2175-8069.2015v12n25p137

Annexes

ANNEX A

Data Collection Form

Code	Topic	Scores
1	Collection of extrajudicial proceedings	
1.1	Are those not involved in the process able to search for procedures?	0 - NO 1 - YES
1.2	Is it possible to look at all processes available without performing a specific search (e.g., by protocol)?*	0 - NO 1 - YES
1.3	Is it possible to search by unit, member, police inquiries, issued recommendations, or terms of conduct adjustment?*	0 - NO 0.5 - PARTIALLY 1 - YES
1.4	Is it possible to access archived processes (with justification for archiving)?	0 - NO 1 - YES
1.5	Is it possible to access the entire content of the opinion reports?	0 - NO 0.5 - PARTIALLY 1 - YES
1.6	Is there other information available, such as subject, parties, completeness of decisions and procedures, member, and position of the person responsible for the process?*	0 - NO 0.5 - PARTIALLY 1 - YES
1.7	Are the decisions handed down by the collegiate bodies of the Public Ministry assigned to the control of purposeful extrajudicial action published?	0 - NO 1 - YES
1.8	Are procedures and decisions available in an open format?*	0 - NO 1 - YES
1.9	Is it possible to download a database containing decisions and/or procedures?*	0 - NO 1 - YES
2	Collection of court cases	
2.1	Are court decisions filed by the Public Prosecutor's Office published on the website?	0 - NO 1 - YES
2.2	Is there other information available, such as theme, third parties, completeness of decisions and procedures, member, and position of the person responsible for the process?*	0 - NO 1 - YES
2.3	Lawsuits filed by the Public Ministry are available in an open format?*	0 - NO 1 - YES
2.4	Is it possible to download a database containing the actions?*	0 - NO 1 - YES
3	Are any precedents or understandings consolidated by the Superior Councils, Colleges of Attorneys, or Coordination and Review Chambers of the various branches of the Brazilian Public Ministry also published?	0 - NO 1 - YES
4	Mandatory disclosure of the lists of cases distributed to each member of the Public Prosecutor's Office or body of the institution, according to the criteria of the resolutions.	0 - NO 1 - YES
5	Budget	
5.1	Records of any transfers or transfers of financial resources	0 - NO 1 - YES
5.2	Expense records	0 - NO 1 - YES
5.3	Information concerning bidding procedures, including the respective notices and results, as well as all contracts	0 - NO 1 - YES
5.4	The budgetary execution of the Public Ministry is available in open data?*	0 - NO 1 - YES
6	Personnel management	

Code	Topic	Scores
6.1	Compensation of members and servants	0 - NO 1 - YES
6.2	Is information available on the members of Superior Councils, Colleges of Attorneys, Coordination and Review Chambers?	0 - NO 1 - YES
7	Internal Control Bodies	
7.1	Information about Internal Affairs	
7.1.1	Possibility of monitoring the internal affairs department's concluded processes available to the public, including the content of decisions	0 - NO 1 - YES
7.1.2	Activity Reports	0 - NO 1 - YES
7.1.3	Repair and inspection reports	0 - NO 1 - YES
7.2	Information about the Ombudsperson	
7.2.1	Activity Reports	0 - NO 1 - YES
7.2.2	Possibility of monitoring completed Ombudsman processes available to the public, including the content of decisions	0 - NO 1 - YES
8	Programs and projects	
8.1	Strategic planning released	0 - NO 1 - YES
8.2	Studies and statistical surveys on its performance are made available	0 - NO 1 - YES
8.3	Are statistical data on performance available in open data? Is it possible to make inferences from the data available?*	0 - NO 1 - YES
9	The list of declassified information in the last 12 months is available	0 - NO 1 - YES
10	List of documents classified in each degree of secrecy available, with identification for future reference	0 - NO 1 - YES
11	Institutional Information	
11.1	Records of competencies and organizational structure	0 - NO 1 - YES
11.2	Addresses, telephone numbers, and business hours of the respective units	0 - NO 1 - YES
11.3	Is information such as addresses, telephone numbers, and business hours easily accessible?*	0 - NO 1 - YES
11.4	Answers to society's frequently asked questions	0 - NO 1 - YES

* Quality dimension

Source: developed by the authors.

ANNEX B

Results according to Public Ministry and sub-item

Code	Dimension	MPAM	MPGO	MPRJ	MPRS	MPSE	FPM
1	Collection of extrajudicial proceedings						
1.1	Are those not involved in the process able to search for procedures?	1	1	1	1	1	1
1.2	Is it possible to look at all processes available without performing a specific search (e.g., by protocol)?*	1	1	1	0	1	1
1.3	Is it possible to search by unit, member, police inquiries, issued recommendations, or terms of conduct adjustment?*	0.5	1	1	1	1	1
1.4	Is it possible to access archived processes (with justification for archiving)?	1	0	0	1	0	0
1.5	Is it possible to access the entire content of the opinion reports?	0.5	0.5	0	1	0.5	0.5
1.6	Is there other information available, such as subject, parties, completeness of decisions and procedures, member, and position of the person responsible for the process?*	0.5	0.5	0.5	1	0.5	0.5
1.7	Are the decisions handed down by the collegiate bodies of the Public Ministry assigned to the control of purposeful extrajudicial action published?	1	1	1	1	1	1
1.8	Are procedures and decisions available in an open format?*	0	0	0	0	0	0
1.9	Is it possible to download a database containing decisions and/or procedures?*	0	0	0	0	0	0
2	Collection of court cases						
2.1	Are court decisions filed by the Public Prosecutor's Office published on the website?	0	0	0	1	0	1
2.2	Is there other information available, such as theme, third parties, completeness of decisions and procedures, member, and position of the person responsible for the process?*	0	0	0	0	0	0
2.3	Lawsuits filed by the Public Ministry are available in an open format?*	0	0	0	0	0	1
2.4	Is it possible to download a database containing the actions?*	0	0	0	0	0	1
3	Are any precedents or understandings consolidated by the Superior Councils, Colleges of Attorneys, or Coordination and Review Chambers of the various branches of the Brazilian Public Ministry also published	0	1	1	1	0	0
4	Mandatory disclosure of the lists of cases distributed to each member of the Public Prosecutor's Office or body of the institution, according to the criteria of the resolutions.	0	0	0	1	0	0
5	Budget						
5.1	Records of any transfers or transfers of financial resources	1	1	1	1	1	1
5.2	Expense records	1	1	1	1	1	1
5.3	Information concerning bidding procedures, including the respective notices and results, as well as all contracts	1	1	1	1	1	1
5.4	The budgetary execution of the Public Ministry is available in open data?*	1	1	1	1	1	1
6	Personnel Management						
6.1	Compensation of members and servants	1	1	1	1	0	1

6.2	Is information available on the members of Superior Councils, Colleges of Attorneys, Coordination and Review Chambers?	1	1	1	1	1	1
7	Internal Control Bodies						
7.1	Information about Internal Affairs						
7.1.1	Possibility of monitoring the internal affairs department's concluded processes available to the public, including the content of decisions	0	0	0	0	0	0
7.1.2	Activity Reports	1	1	1	0	0	0
7.1.3	Repair and inspection reports	0	0	0	0	1	0
7.2	Information about the Ombudsperson						
7.2.1	Activity Reports	1	1	1	1	1	1
7.2.2	Possibility of monitoring completed Ombudsman processes available to the public, including the content of decisions	0	0	0	0	0	0
8	Programs and Projects						
8.1	Strategic planning released	1	1	1	1	1	1
8.2	Studies and statistical surveys on its performance are made available	1	1	1	0	1	1
8.3	Are statistical data on performance available in open data? Is it possible to make inferences from the data available?*	0	0	0	0	1	1
9	The list of declassified information in the last 12 months is available	1	1	1	1	1	1
10	List of documents classified in each degree of secrecy available, with identification for future reference	1	1	1	1	1	1
11	Institutional Information						
11.1	Records of competencies and organizational structure	1	1	1	1	0	1
11.2	Addresses, telephone numbers, and business hours of the respective units	1	1	1	1	1	1
11.3	Is information such as addresses, telephone numbers, and business hours easily accessible?*	1	1	0	1	1	1
11.4	Answers to society's frequently asked questions	1	1	1	1	0	1

Source: developed by the authors.

repec
Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting
ABRACICON
Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br
REPeC, Brasília, v. 17, n. 2, art. 5, p. 199-218, Apr./Jun. 2023 | DOI: http://dx.doi.org/10.17524/repec.v17i2.3250 | ISSN 1981-8610

Sociodemographic characteristics and differences in Machiavellianism and perceived justice among graduate students in the Business field

João Victor Lucas
https://orcid.org/0000-0001-6135-5874

Flaviano Costa
https://orcid.org/0000-0002-4694-618X

Abstract

Objective: This study aimed to compare differences in the perception of Academic Justice and Machiavellianism among graduate students in the Business field according to their sociodemographic characteristics.

Method: A survey was conducted, and 334 valid responses were collected from Brazilian graduate students. The Portuguese-translated and validated versions of the Revised Classroom Justice Scale (RCJS) and Machiavellian Personality Scale (MPS) were applied. Data analysis included descriptive statistics, analysis of reliability, and analysis to verify whether data were normally distributed, and later, Kruskal-Wallis of Independent Samples.

Results: Significant differences were found between genders regarding the perception of Academic Justice, indicating that women more frequently perceive lower levels of justice. Analysis of the region where the educational institution is located showed that students from the Northeast, North, and Midwest also perceive lower levels of justice. Regarding Machiavellian traits, younger students tend to present more prominent Machiavellian traits, while Accounting students are more suspicious of others than the remaining students in the Business field.

Contributions: This study adds to the literature on accounting education, indicating that personal and sociodemographic characteristics can be considered in the students' individual and behavioral analyses. Additionally, it shows potential specificities in policies and actions to be implemented among different students when dealing with injustice in a graduate environment.

Keywords: Academic Justice. Machiavellianism. Sociodemographic Characteristics. Graduate Programs. Business field.

Published in Portuguese and English. Original Version in Portuguese.

Round 1: Received in 1/17/2023. Review requested on 3/21/2023. Round 2: Resubmitted on 4/21/2023. Accepted on 4/22/2023 by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 6/30/2023. Organization responsible for the journal: Abracicon

1. Introduction

The perception of justice in different spheres is a complex and not objective value, as it involves several factors that explain why something is perceived as fair or unfair (Tyler, Boeckmann, Smith & Huo, 1997). Choory-Assad (2002) applied the theoretical basis of the organizational environment to study how the perception of justice is aligned in the academic setting. Although justice in a university and organizational environment is classified into different dimensions, it is essential to remember that people's perceptions also differ, which leads to different perspectives of social justice (Törnroos et al., 2019).

Different conditions influence the idea of justice, including situational and personal issues, such as personal and social dispositions (Major & Deaux, 1982; Greenberg, 2001). In this sense, current literature shows the existence of a relationship between perceptions of organizational justice and personality traits, holding that personality traits can help in understanding how the perception of justice develops (Shi et al., 2010; Törnroos et al., 2019; Wang, Hackett, Zhang & Cui, 2019).

Considering prior adherence to the objectives and structures expected from the Business field, this study essentially deals with the Machiavellian personality trait. The reason is that Machiavellianism highlights essential characteristics for developing valuable skills in the Business field, such as the willingness to develop strategies, an inclination to use political procedures, and behaviors aimed at power and control (Dahling, Whitaker & Levy, 2009).

When related to an academic setting (classroom), Machiavellian elements may lead to distorted perceptions of social injustice. It occurs due to the relationship in the literature between a high degree of justice perception with the fulfillment of class rules and satisfaction with grades (Colquitt, 2001).

Therefore, studying sociodemographic characteristics related to Academic Justice in the Business field and the Machiavellian trait among graduate students is important to understand central issues regarding these individuals' professional and academic performance. Machiavellianism is associated with skills related to political engagement and strategy making, which are important factors in the business field. Investigating these students' perception of justice is essential to consider how to use the academic experience of these individuals efficiently.

Contextual and sociodemographic factors must be considered to understand the characteristics mentioned above when investigating Academic Justice and Machiavellianism among Business students. Such factors include gender identification, ethnicity, age, and information about the graduate program, such as the type of educational institution, the region where the program is located, and the graduate program field. These variables are important for a psychological analysis of human behavior and are included in this study as potential predictors (Hambrick & Mason, 1984).

Hence we consider the questions previously described from the perspective in which two constructs intersect and how characteristics can enhance the typical behaviors of graduate students. Aware that individual issues and human sociability are latent signs in the understanding of what can be considered Academic Justice perception and Machiavellianism, we ask the following question: *what are the differences between perceived Academic Justice and the Machiavellian Trait among graduate students in the Business field, considering their sociodemographic characteristics?*

The question above proposes a comparison between the differences in the perception of Academic Justice and the Machiavellianism trait among graduate students in the Business field, according to their sociodemographic characteristics.

This study contributes to the current literature by providing empirical content to support understanding of individual differences related to practical and behavioral aspects and their different personal and social characteristics in the graduate environment, considering that personality can help explain individual differences in the perception of justice (Törnroos et al., 2012).

Considering the previous discussion, studying the perception of justice and how it is distributed among different university groups can support the managerial practices of coordinators of programs in the Business field. The reason is the possibility of implementing actions that support good relationships between students and professors, promoting effective learning and academic performance.

The Machiavellian traits are addressed in this study because it is a construct with important implications for organizational and academic criteria, using elements focused on power, strategy, and political dispositions (Dahling, Whitaker & Levy, 2009). Note that these strategic dispositions in interpersonal relationships can be applied following the same personality predispositions in different organized environments with social interaction, such as organizations and the academic milieu.

When the study of individual characteristics, such as personality traits and the perception of Academic Justice, is linked to the differences between the characterizing groups, it leads to the possibility of decision-making focused on equity and diversity policies in the educational environment, considering the differences among graduate student groups. Hence, this study also seeks to add to the literature issues related to the particularities of each group, indicating how different students see graduate studies, in addition to identifying what could change this view.

Considering sociodemographic elements in graduate university policies is important because such aspects affect diversity and inclusion in the academic environment. Such aspects may encompass factors such as the needs of students from ethnic and socioeconomic minorities, as well as students with special needs. In addition, it is important to consider sociodemographic elements that can ensure that university policies are equitable and fair for all students, including those with different personality dispositions and behaviors (Darnell & Darnell, 2019).

Regarding the study setting, another difference concerns understanding how the student-professor relationship was readapted during the pandemic, what was necessary to adapt for the continuity of the graduate programs, and how these reflected in the professors' performance and, consequently, the students' perception of fairness.

In the academic environment, it is relevant to understand the factors involving professors and educational institutions and the behaviors that lead to feelings of fairness or unfairness. The latter may lead to several responses, such as aggressiveness, frustration, lack of motivation, loss of confidence in faculty members, poor academic performance, aggressive behavior toward professors, and dishonesty (Santos et al., 2020).

2. Theoretical framework

2.1 Academic Justice

Education has a distinct sphere of justice, as there are constant processes in which rewards are distributed, assessments are implemented, and relationships are established, and these can be considered fair or unfair (Res & Sabbagh, 2016). Thus, an opportunity arises for specific research that considers the academic environment to a different line of research, Academic Justice. Academic Justice, initially addressed as classroom justice, can be defined as "perceptions of fairness regarding outcomes or processes that occur in the instructional context" (Chory-Assad & Paulsel, 2004, p. 254).

The first studies involving justice perceptions, based on the theory of organizational justice, addressed a single dimension of justice to understand phenomena concerning how people judge different situations, responding according to what is considered fair or unfair, which concerns the distributive dimension of justice (Sanches, 2016). These studies were based on the Social Exchange Theory proposed by Homans (1961), in which the author defends that proportionality between rewards and investments is expected in an exchange relationship between individuals; there is a perception of Distributive Justice when such proportionality is achieved.

Distributive justice concerns what results are distributed; procedural justice concerns how results are distributed; and interactional justice conceptualizes justice in terms of how individuals are treated (respect and politeness) and how they receive information (appropriateness and truthfulness). These dimensions combined provide a more comprehensive description of the perception of fairness or unfairness (Rasooli, Zandi & DeLuca, 2019).

Distributive justice is centered on the perception that the distribution of conditions and goods that affect an individual's, group's, or community's well-being, including psychological, physical, physiological, economic, and social well-being, is considered fair (Deutsch, 1985; Chory & Paulsel, 2004). Distributive justice matters arise in the academic environment, for example, when a teacher assigns grades to discipline (Chory & Paulsel, 2004).

While distributive justice is linked with perceptions of how fair is the distribution of results, the procedural dimension concerns how fair the procedures are adopted when distributing resources (Cropanzano & Greenberg, 1997). Procedural justice concerns the process components of the social system that regulate the distribution of resources, and it focuses on the evaluation of individuals and the events that precede such distribution (Leventhal, 1980).

When the procedural justice dimension is analyzed in the academic environment, it refers to the perception of how fair the processes adopted in the classroom to attribute results are. The students may consider fair or unfair the procedures and criteria chosen to evaluate students and assign grades, considering that, in the instructional environment, the assessment criteria can be previously presented to the students (Berti, Molinari & Speltini, 2010).

Note that when procedural fairness is high, the distribution of results, even if unfair, is considered unimportant because the distribution will be reasonably reconfigured in the long run. In contrast, when this dimension is considered low, the individuals' immediate self-esteem and self-identity needs are frustrated, suggesting that future interactions will also be unsatisfactory (Chory, 2004).

Finally, interactional justice concerns what is considered fair or unfair in interpersonal relationships, which initially concerned relationships in business organizations (Bies & Moag, 1986). In this dimension of justice, there is a need to discuss aspects concerning the treatment dispensed in the interpersonal relationships between agents (Tyler & Blader, 2003). Interactional justice within a classroom plays a leading role, considering that the way teachers and students interact significantly shapes the learning environment and promotes positive behavior and student motivation (Wubbels & Brekelmans, 2005).

In summary, the dimensions are separated considering interpersonal relationships as an integral element of the perception of justice; hence, they are not separated into opposite dimensions, as they share a similar origin. This model also considers the quality of treatment people receive during academic and organizational processes at educational institutions (Simil, 2016). In short, the dimensions of academic justice addressed here are distributive, procedural, and interactional.

An analysis of the students' sociodemographic characteristics in light of academic justice shows that students' perceptions of Justice differ significantly according to gender, type of graduate program, and education. For example, younger university students start with a fairer perception of the learning environment, but their perceptions of fairness decrease as they stay longer and change ties. Thus, justice perception seems to differ between groups of students. Regarding gender, there is a more significant perception of male gender justice, showing that female relationships are seen as more unfair compared to male perceptions (Çaglar, 2013).

Still, on the graduate students' sociodemographic characteristics, female students perceive a lower level of justice compared to male students (Berti, Molinari & Speltini, 2010; Simil, 2016; Sabino, Cunha, Colauto & Francisco, 2019). As for age, there is a positive relationship between this variable and other dependent variables; i.e., the older the student, the greater his/her perception of distributive, procedural, and interactional justice. For example, Chory (2007) verified that younger students – under 21 – tend to have lower perceptions of distributive and procedural justice. The investigation of similar relationships will contribute to an overview of the perception of justice according to individual characteristics.

In addition to the issues raised and defended here, we must consider that female students from a given country or region tend to perceive justice to a lesser extent. On the other hand, students from another region may have the opposite perception. Therefore, it is necessary to relativize the analyses and potential generalizations (Simil, 2016). Thus, aiming to contribute to the literature, this study highlights academic issues in a graduate context with different interrelationships and manners in which the agents connect to identify whether temporal changes and educational modalities significantly change graduate students' perception of justice.

2.2 Machiavellianism

Personality traits are influenced by human concerns toward occupational, educational, relationship, personal, and antisocial behavior. In this sense, educational behavior is included as one of the aspects linked to personality characteristics (Furnham et al., 2013).

An important personality trait pioneered by the literature is Machiavellianism, characterized as a non-pathological trait, as a personality disposition or social conduct strategy referring to the manipulation of individuals for personal gain (Christie & Geis, 1970). Machiavellianism originates from the political ideas of Niccolò Machiavelli (1469-1527).

When applied at moderate levels, Machiavellianism considers that the individual can be a good leader, presenting better behavior results in terms of rights and duties in an organizational sphere due to cost and benefit analysis. Hence, a leader will try to control and coordinate his/her employees as best as possible, always observing his/her interests (Zettler & Solga, 2013).

Like other constructs addressed in the literature, Machiavellianism has a multidimensional structure, encompassing underlying motivations (desire for control and desire for status) and behavioral factors (distrust of others and amoral manipulation) (Dahling et al., 2009). Consequently, Machiavellianism usually has four dimensions: (i) distrust in others; (ii) amoral manipulation; (iii) desire for control; and (iv) desire for status (Dahling, Whitaker & Levy, 2009; Grohmann & Battistella, 2012).

The Machiavellian profile may be associated with strategic calculation, leadership, desire for status, amoral manipulation, and dishonesty (Alves, Costa, Nascimento & Cunha, 2019). The typical traits of Machiavellianism can be confused with psychopathy traits. The use of strategic planning is something that differentiates between these profiles. While Machiavellians plan, build alliances and do their best to maintain a positive reputation, psychopaths act impulsively, abandon friends and family, and pay little attention to their reputations (Jones & Paulhus, 2011).

To establish the main differences between groups and the Machiavellian personality trait, Collison, South, Vize, Miller, and Lynam (2019) verified that male individuals present a more prominent Machiavellian trait. Their study's findings support the notion that moderate differences in Machiavellianism between genders are not artifacts of measurement bias.

From the same perspective, D'Souza and Lima (2018) found evidence of Machiavellianism and the sociodemographic characteristics of undergraduate Accounting students, concluding that men have a more prominent Machiavellian personality trait than women. Additionally, the Machiavellianism traits differed according to age, being more predominant among younger students with a greater predisposition for manipulation and strategy.

Regarding the sociodemographic variables of Machiavellianism, D'Souza (2020) noted that age is a potential predictor of the Machiavellianism trait. In her research, the author highlights that respondents between 18 and 25 years old are more prone to Machiavellian traits, which is in line with D'Souza and Lima (2018), suggesting that students aged 17 to 25 present a greater predisposition to manipulation and strategy.

In the educational context, Machiavellianism stood out when it was related to cultural values among Accounting students, indicating greater student agreement with the assertions "it is not wise to tell my secrets" and "there are things that I hide from other people because they do not need to know." The study showed a preponderance of Machiavellianism-related characteristics and a greater inclination of students toward individualism (D'Souza & Lima, 2019).

Alves et al. (2019) sought to relate Machiavellianism to counterproductive activities among Accounting students, and they mainly found that there is no empirical evidence supporting the claim that Machiavellianism is related to counterproductive behavior. Additionally, relating this trait with the students' gender revealed that it became more evident among those identified with the male gender.

The theoretical and empirical evidence presented here suggests that sociodemographic features such as gender, age, aspects related to one's region, and the graduate program field imply statistically significant differences between individuals. Additionally, the graduate academic experience of individuals with different Machiavellianism traits may be influenced by their perception of fairness or unfairness during graduate studies. Moreover, their professional performance may change depending on whether Machiavellian behaviors are expected in academic and professional activities, such as political predisposition and developing strategies.

3. Methodological procedures

This descriptive study (Sampieri, Collado & Lucio, 2013) has a primarily quantitative approach, and data were collected with a structured questionnaire (Cooper & Schindler, 2016). This questionnaire was developed using the Survey Monkey online platform. It was sent via e-mail between November and December 2021 to the coordinators of Brazilian graduate programs in Business Administration, Accounting, and Economics, to help distribute the questionnaire to the students.

This study addressed the population of students enrolled in graduate programs in Administration, Accounting, and Economics, including academic and professional masters and doctoral degrees registered with the Coordination for the Improvement of Higher Education Personnel (Capes). The Business field comprises 257 graduate programs, including 65 academic master's and three academic doctoral programs and 93 programs with both modalities. Additionally, there are nine professional master's and doctoral programs and 93 programs containing only one professional master's degree. Overall, there are 158 Brazilian academic master's programs, 96 academic doctoral courses, 96 professional master's programs, and nine professional doctoral programs.

A non-probabilistic sample (convenience sampling) was used; i.e., the probability of a specific graduate student being included in the sample is not the same for all other students. Therefore, the results cannot be generalized beyond this study's participants, as we did not address the entire population (Fávero & Belfiore, 2017).

The questionnaire consists of four blocks. The first block addresses the respondents' educational level, filtering whether the individuals meet the study's criterion, i.e., graduate students in the Business field. The survey was closed whenever the individuals reported an undergraduate, specialization, MBA, or postdoctoral program because these spheres did not belong to this study's scope.

The second block includes the translation of the Revised Classroom Justice Scale (RCJS), a 34-item questionnaire rated on a 5-point Likert scale, in which 1 represents a perception of Extreme Injustice, and 5 represents Extreme Academic Justice. This questionnaire was first developed by Chory-Assad (2002), updated by Chory (2007), and later Simil (2016) translated it into Portuguese, addressing a graduate program. It includes Distributive, Procedural, and Interactional Justice factors.

Next, questions from the Machiavellian Personality Scale - MPS (Dahling, Whitaker & Levy, 2009) were added. This scale is composed of 18 statements intended to rate Machiavellianism on a 5-point Likert scale (1="Strongly Disagree" and 5="I totally agree"). The MPS was first developed by Dahling, Whitaker, and Levy (2009), and later Grohmann and Battistella (2011) translated and adapted it to Portuguese. It is organized into Amoral Manipulation, Distrust in Others, Desire for Control, and Desire for Status.

The last block in the questionnaire addressed the participants' personal characteristics and information about their graduate programs, where the objective was to outline the respondents' sociodemographic profile. According to the current literature, the primary characteristics were age, gender identification, race or ethnicity, type of educational institution, and graduate program.

The data obtained through the Survey Monkey platform were organized in the Microsoft Office Excel software and analyzed using the Software Statistical Package for the Social Sciences (SPSS), version 22. Figure 1 presents the data analysis steps.

Steps	Procedure	Measures	Objective	Criteria
1	Descriptive Statistics	Frequency	Describe the data set	-
2	Scale's reliability analysis	Cronbach's alpha	Verify the scale's internal consistency	The acceptable range is above 0.70
3	Normality	Kolmogorov-Smirnov	Verify whether the dataset is normally distributed	p-value > 0.05
4	Kruskal-Wallis test (Independent samples)	Kruskal-Wallis Chi-square test	Verify whether there are statistically significant differences between the respondents' sociodemographic characteristics	Significant differences P-value < 0.05

Figure 1. Data Analysis Protocol

Source: Hair et al. (2009).

Frequency techniques were adopted to organize, describe, and synthesize the quantitative dataset's main characteristics, enabling a better understanding of the sample (Fávero & Belfiore, 2017). The Cronbach's alpha coefficient was used to verify the scales' reliability and consistency (Fávero & Belfiore, 2017). According to Hair Jr. et al. (2009), Cronbach's Alpha measures a construct's reliability on a scale from 0 to 1; 0.7 is the minimum value acceptable to validate a questionnaire.

We did not need to confirm the structure between specific variables of the Brazilian versions of the Revised Organizational Justice Scale (RCJS) (Simil, 2016) and the Machiavellian Personality Scale (MPS), as they had already been respectively developed and reviewed by Chorry-Assad (2002), Chory and Paulsel (2004), Chory (2007) and Dahling, Whitaker, and Levy (2009). These studies verified the factors developed by the literature thus far, which include perceptions of Distributive, Procedural, and Interactional Academic Justice as factors of Academic Justice and Amoral Manipulation, Distrust in Others, Desire for Control, and Desire for Status as factors of Machiavellianism. Considering ethical issues inherent to research addressing human subjects, this study was submitted to and approved by the Institutional Review Board at the Federal University of Paraná and registered under No. 51403221.0.0000.0102 without any restrictions.

4. Analysis and discussion of results

4.1 Respondents' characterization

A total of 551 individuals completed the data collection instrument. Twenty-three questionnaires were discarded because their respondents indicated they were not enrolled in a graduate program. Of the 528 remaining responses, 194 were incomplete and excluded from the sample. The remaining 334 responses were considered valid for analysis and represented 60.62% of the responses collected.

The students' characteristics are listed in Table 1 and are used to outline the respondents' profiles.

Table 1
Respondents' profile – Personal characteristics

Age group*	Men		Women		Others**	
	Frequency	%	Frequency	%	Frequency	%
22 to 28 y/o	44	27.33%	53	31.18%	0	0.00%
29 to 32 y/o	33	20.50%	43	25.29%	1	33.33%
33 to 40 y/o	42	26.09%	37	21.76%	0	0.00%
41 to 65 y/o	42	26.09%	37	21.76%	2	66.67%
Race/ Ethnicity	**Men**		**Women**		**Others****	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Asian-descendant	3	1.86%	3	1.76%	0	0.00%
Caucasian	92	57.14%	123	72.35%	2	66.67%
Indigenous	1	0.62%	1	0.59%	0	0.00%
Mixed race	56	34.78%	33	19.41%	1	33.33%
African-descendant	9	5.59%	10	5.88%	0	0.00%
Total	161	170	100.0%	100%	3	100%

Note: *Parts calculated by inclusive quartile. **Respondents identified as Non-binary or who chose not to report gender.

Source: developed by the author based on the study's data.

Table 1 shows that 50.9% of the 334 students in the final sample identify themselves with the female gender. Note that the students are distributed according to age groups comprising the interval between 22 and 65. The group comprising those between 22 and 28 concentrates the largest proportion of students (29.04%); approximately half of these (52.10%) were aged between 22 and 32. Regarding race or ethnicity, most of the sample declared themselves Caucasians (65.0%), followed by mixed race (26.9%), Afro-descendant (5.7%), Asian-descendant (1.8%), or indigenous (0.6%). The respondents' academic characteristics are shown in Table 2.

Table 2
Respondents' profile – Academic characteristics

Graduate Program filed	Men		Women		Others*	
	Frequency	%	Frequency	%	Frequency	%
Business administration	64	39,75%	72	42,35%	1	33,33%
Accounting	56	34,78%	83	48,82%	2	66,67%
Economics	41	25,47%	15	8,82%	0	0,00%
Program's modality	**Men**		**Women**		**Others**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Academic Master's degree	87	54,04%	86	50,59%	3	100,00%
Academic doctoral degree	58	36,02%	65	38,24%	0	0,00%
Professional Master's degree	14	8,70%	17	10,00%	0	0,00%
Professional doctoral degree	2	1,24%	2	1,18%	0	0,00%
HEI region	**Men**		**Women**		**Others**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Midwest	14	8,70%	16	9,41%	0	0,00%
Northeast	37	22,98%	32	18,82%	0	0,00%
North	4	2,48%	1	0,59%	0	0,00%
Southeast	43	26,71%	27	15,88%	2	66,67%
South	63	39,13%	94	55,29%	1	33,33%
Total	161	170	100,0%	100%	3	100%

Note. HEI: Higher Educational Institution. *Respondents identified as Non-binary or who chose not to report gender.

Source: developed by the author based on the study's data.

Regarding the respondents' academic characteristics, there is an equal participation of graduate students attending the Accounting (42.2%) and Business Administration (41.0%) programs; most pursuing an academic Master's degree (52.7%), followed by an academic doctoral degree (36.8%). Most participants attended educational institutions located in the South (47.3%), followed by the Southeast (21.6%) and Northeast (20.7%). Additionally, 84% of the respondents attended a public university.

4.2 Descriptive statistics

After characterizing the sample, which enabled identifying the participants' profiles, the responses to the scales measuring the perceptions of Academic Justice and Machiavellianism traits were statistically described. Hence, Cronbach's alpha was used to measure the constructs' reliability, which verifies the correlation between the responses to a questionnaire through response analysis. Cronbach's alpha coefficient ranges from 0 to 1; parameters above 0.7 are acceptable (Hair Jr. et al., 2009). A Cronbach's Alpha equal to 0.914 was found in this study, confirming the constructs' reliability.

The RCJS was analyzed to detail the respondents' perceptions regarding the statements concerning Distributive Justice. Thus, Table 3 presents the statements with the highest levels of disagreement and agreement (scores 1 and 5) and an analysis of the percentage of the main items. As determined by the instrument regarding the students' opinion, score 1 represents a perception of Extreme Injustice in the Classroom, and 5 represents Extreme Academic Justice.

Table 3
Revised Classroom Justice Scale – Descriptive Statistics

RCJS Item – Distributive Justice	1	2	3	4	5	Total
In general, your grades on the tests and assessments you have already taken during your current program...						
... compared to other students' grades, were: (Q1)	0.9	3	14.7	46.4	35.0	100
... compared to your effort to study for the assessments, were (Q4)	4.2	6.9	18.6	43.7	26.6	100
RCJS Item – Procedural Justice	**1**	**2**	**3**	**4**	**5**	**Total**
According to your experience in the graduate program, rate the following statements from 1 to 5, considering that 1=Extremely unfair and 5=Extremely fair						
Attendance policies are: (Q11)	1.8	8.7	16.8	39.2	33.5	100
The amount of time you need to dedicate to the program to obtain good grades is: (Q25)	12.9	18.9	24.3	26.6	17.4	100
RCJS Item –Interactional Justice	**1**	**2**	**3**	**4**	**5**	**Total**
According to your experience in the graduate program, rate the following statements from 1 to 5, considering that 1=Extremely unfair and 5=Extremely fair						
The way the professors treat the students is: (Q27)	5.4	10.5	21	30.2	32.9	100
How the professors deal with students who disagree with them is: (Q34)	10.8	12.9	29.6	25.1	21.6	100

Notes: Percentages; 1: Extremely unfair; 5: Extremely fair.

Source: developed by the author based on the study's data.

An analysis of each statement representing the students' perception regarding distributive justice in graduate school shows that the statement most frequently rated as "Extremely fair" is "Q1 - In general, your grades in the tests and assessments you have already taken during your current program, compared to the grades of other students, were:", showing that students tend to believe that the level of justice concerning the results distributed by professors does not differ among students, i.e., the results are similarly distributed among peers.

On the other hand, the statement most frequently rated as Extremely Unfair concerns "Q4 – Compared to your efforts to study for the tests, were:" This result shows evidence of whether the students perceive that their effort to study for the tests is recognized, revealing their dissatisfaction with their results, considering their effort to do well in the assessments.

According to Chorry-Assad (2002), the students' dissatisfaction with the results concerns the evaluation processes and policies adopted by the professors and teaching institutions. Procedural Justice, which refers to the processes adopted by professors, is perceived as the least fair in the academic environment, corroborating previous studies (Chorry-Assad, 2002; Paulsel & Chory, 2004).

Statement Q11 in Procedural Justice, which concerns attendance policies, is perceived by students as very fair (score 5), indicating that professors are concerned with establishing fair rules regarding student attendance. The results show that students tend to compare their grades and processes adopted by the professors with their effort and time dedicated to the program, leading them to expect better results (Distributive Justice) and becoming dissatisfied with the amount of time required by the graduate program (Justice Procedural).

Connections with the existing literature were established when interpreting the Interactional Justice results, revealing the professors' tendency to treat students well, being cordial and respectful during academic activities. Nevertheless, the students tended to perceive the non-acceptance of disagreements and difficulty in opening up to the students' new ideas as unfair; such a perception is associated with professors' lack of disposition to listen to students (Chory, 2007; Simil, 2016).

The next portion of this section presents the descriptive results of the Machiavellian Personality Scale (MPS). Following, we present the most frequent ratings of each statement. A detailed analysis in Table 4 revealed the statements with the highest levels of disagreement and agreement (scores 1 and 5). Additionally, descriptive statistics are provided of the students' responses to the MPS according to the dimension, showing the level of agreement among the graduate students in the Business program with Machiavellian traits.

Note that the statements "Q1 – There is no excuse for deceiving another person", "Q8 – I like to share my plans and ideas with other people," and "Q18 – Personal development is one of my most important goals" were inverted in the data analysis, as these are statements purposefully opposed to the construct.

Table 4
Machiavellian Personality Scale – Descriptive Statistics

	MPS Item	1	2	3	4	5	Total
Rate the statements from 1 to 5 according to your level of agreement: 1 Totally disagree e 5 and 5 Totally agree	Amoral Manipulation						
	There is no excuse for deceiving another person (Q1)	56.9	25.1	9.0	4.8	4.2	100.0
	I am willing to be unethical if I believe it will help me succeed (Q4)	78.4	12.0	3.3	3.6	2.7	100.0
	Distrust of Others						
	People are only motivated by personal gain (Q6)	1.2	6.0	19.8	42.5	30.5	100.0
	If I show any weakness at work, other people will take advantage of it (Q10)	24.3	26.6	24.3	17.1	7.8	100.0
	Desire for Control						
	I think that fear and threats are sometimes necessary to motivate people to do what I want (Q11)	68.3	15.9	9.6	4.2	2.1	100.0
	I enjoy being able to control the situation (Q14)	4.8	10.2	24.3	40.7	20.1	100.0
	Desire for Status						
	I assume that most people are out for their success (Q16)	2.7	8.1	20.7	42.5	26.0	100.0
	Personal development is one of my most important goals (Q18)	29.6	36.2	21.0	9.9	3.3	100.0

Notes: Percentage; 1: Totally disagree; 5: Totally agree.

Source: developed by the author based on the study's data.

Table 4 describes a greater willingness of students to disagree with the Machiavellian personality trait compared to perceived academic justice during graduate school. Such a Machiavellian personality trait at a moderate level in Business students is in line with previous studies, which concluded that students tend to have Machiavellian characteristics at a moderate level (Jones & Paulhus, 2014; D'Souza et al., 2018; Mendonça, Silva, & Silva Filho, 2018; Alves et al., 2019).

Furthermore, it is noteworthy that when the characteristics of a Machiavellian personality are moderate, the individual tends to be a good leader, presenting better behavior results in terms of rights and duties in the corporate sphere, considering a cost and benefit analysis. A leader will try to control and coordinate his/her employees as best as possible, always focusing on their interests (Zettler & Solga, 2013).

The different dimensions of Machiavellianism also provide separate conclusions concerning the behavioral elements that make up this personality trait, and a lower level of agreement was found with statements concerning amoral behaviors. At the same time, the Desire for status appears as the most frequent characteristic of Machiavellianism. This study's results align with the results reported by Spurk et al. (2016) among industry executives, in which status was positively related to Machiavellianism.

Among the MPS' statements, low levels of agreement were found regarding the Amoral manipulation dimension. The statements most frequently disagreed with include "Q4 – I am willing to be unethical if I believe it will help me succeed". Such disagreement among students regarding the statements related to the Amoral manipulation dimension corroborates previous studies (Alves et al., 2019; Raifur-Kos & Raifur-Kos, 2021), showing that graduate students recognize other benefits from interpersonal relationships rather than exclusively valuing beneficial information.

The other Machiavellianism-related statement that obtained the lowest agreement among the students (Q4 – I am willing to be unethical if I believe it will help me succeed) shows that even though they agreed with Machiavellianism characteristics, the graduate students in the Business field tend to be ethical when seeking results that involve academic performance. These results are aligned with previous research results, indicating highly ethical behavior among accounting professionals (D'Souza, 2020) and a predisposition of Accounting students to civilized behavior (Alves et al., 2019).

Another statement in the Machiavellian personality scale that stands out due to its low level of agreement among the graduate students in the Business field concerns "Q11 – I think that fear and threats are sometimes necessary to motivate people to do what I want". This finding corroborates elements previously addressed in the literature that involve the successful leadership of Machiavellians. It suggests that creating a Machiavellian success strategy comprises charisma and a search for support (Delunga, 2001). Additionally, the actions of individuals in the Business field, such as the ability to formulate strategies and flexibility, tend to positively impact the interactional environment (D'Souza & Jones, 2017).

Table 4 shows that the Desire for status is the characteristic of Machiavellianism with the highest level of agreement among graduate students in the Business field. The statement most frequently agreed with is "Q16 – I assume that most people are out for their own success". These findings align with a search for status arising from their choice of an academic career (Souza, Lopes, Costa & Colauto, 2021), a reference for graduate students, the object of this study.

Additionally, regarding data concerning the Machiavellianism personality trait, the statement with the highest level of agreement among the graduate students was "Q6 – People are only motivated by personal gain", which highlights their perceptions regarding other peoples' intentions. This perspective highlights a behavior focused on the Distrust of Others when one sees his/her personal characteristic as the goals of others, which is the main characteristic trait among graduate students in the Business field.

4.3 Differences between the Groups

A normality test was required to identify the most appropriate statistical technique to analyze the scores' differences according to the participants' sociodemographic variables. The Kolmogorov-Smirnov test indicated that data were not normally distributed; hence, the non-parametric Kruskal-Wallis test was adopted, as data were categorical and did not meet the parametric tests' assumptions.

The Kruskal-Wallis test was used to verify differences between the participants' scores concerning justice, Machiavellianism traits, and sociodemographic variables. Each dimension of Academic Justice and Machiavellianism was tested separately with sociodemographic variables, including gender, age, the region where the institution is located, and the graduate program field, according to the literature applicable to these constructs.

Table 5 presents the Kruskal-Wallis test's results to verify whether there were significant differences between the groups based on sociodemographic characteristics, such as gender and age group.

Table 5
Kruskal-Wallis Test – Personal Characteristics

Construct / Dimension		Gender				
		Sig. Kruskall-Wallis	Scores Masc.	Scores Fem.	Scores PNR	Scores NB
AJ	**Academic Justice**	**0.000* – Yes**	**187.03**	**148.16**	**13.50**	**272.75**
	Distributive Justice	0.083 – No	178.34	157.67	14.50	206.25
	Procedural Justice	**0.006* – Yes**	**184.85**	**150.93**	**15.15**	**255.50**
	Interactional Justice	**0.001* – Yes**	**187.23**	**148.00**	**51.00**	**295.00**
MACH	Machiavellianism	0.704 – No	167.58	168.00	28.25	187.25
	Amoral manipulation	0.251 – No	178.81	156.69	146.00	187.25
	Disbelief in Others	0.339 – No	163.91	172.41	58.50	93.75
	Desire for Control	0.329 – No	172.31	163.23	210.50	32.50
	Desire for Status	0.370 – No	162.86	171.30	255.25	92.00
Construct / Dimension		**Age range**				
		Sig. Kruskall-Wallis	**Scores 22-28**	**Scores 29-32**	**Scores 33-40**	**Scores 41-65**
AJ	Academic Justice	0.449- No	173.73	153.42	165.39	175.61
	Distributive Justice	0.650 – No	176.10	163.34	158.69	169.88
	Procedural Justice	0.355 – No	172.20	150.86	168.71	176.61
	Interactional Justice	0.563 – No	166.95	156.34	168.11	178.30
MACH	**Machiavellianism**	**0.000*- Yes**	**187.24**	**182.18**	**171.33**	**125.61**
	Amoral manipulation	**0.009* – Yes**	**189.03**	**177.19**	**165.16**	**139.25**
	Disbelief in Others	**0.000* – Yes**	**186.51**	**184.92**	**156.29**	**126.99**
	Desire for Control	0.768 – No	169.74	170.05	172.17	157.66
	Desire for Status	**0.002* – Yes**	**178.99**	**185.08**	**170.96**	**133.18**

Note. *p-value < 0e05; AJ: Belong to the Academic Justice Construct (RCJS); MACH: Belong to the Machiavelism Construct (MPS). Scores: scores obtained in the Kruslall-Wallis test by each of the variables.

Source: study's data.

The results presented in Table 5 show that both personal characteristics result in significant differences regarding one's perception of Academic Justice, considering the respondents' gender and differences in the Machiavellian trait and comparing the participants' age range.

A significant difference was found between the male and female genders when the differences regarding the students' perception of Academic Justice were disaggregated, in addition to the two dimensions in which significant differences were found: Procedural Justice and Interactional Justice. A comparison of the scores obtained by women and men in perceived justice showed that men have a higher perception of justice than women in Academic, Procedural, and Interactional justice.

This result aligns with previous studies addressing the academic milieu (Berti, Molinari & Speltini, 2010; Simil, 2016; Sabino, Cunha, Colauto & Francisco, 2019), showing that women more frequently perceive the academic environment to be unfair, especially regarding the policies and procedures the professors adopt and in the communication and provision of information. Hence, according to the results, graduate programs appear to be fairer for male students.

As for the differences between gender and Machiavellianism personality traits, this study diverges from previous findings. The reason is that no statistically significant differences were found between gender and this trait. According to this study's results, this divergence from the literature is possibly explained by the low frequency of Machiavellianism trait among graduate students in the Business field, corroborating previous studies on the topic (D'Souza, 2016; Alves et al., 2019).

Nevertheless, Machiavellianism showed significant differences between the students' age groups. The dimensions of Amoral manipulation, Distrust in Others, Desire for Status, and the general construct, showed significant differences between the groups. Respondents aged 22 and 28 showed a high level of Machiavellianism traits compared to those aged 41 to 65, who presented a lower prevalence of this trait. According to the literature, the age difference follows an expected trend of a more prevalent presence of Machiavellianism among younger individuals (D'Souza & Lima, 2018; D'Souza, 2021).

The differences between the age groups suggest the possibility of discussing the strategic characteristics of Machiavellianism and its vision of the future, which is more common among younger people. However, there was no significant difference regarding the Desire for control. Such a result may be explained by the fact that older people historically need to maintain control rather than seek future control.

In addition to the respondents' sociodemographic characteristics, this study aimed to identify differences in the respondents' academic information, which, as suggested in the literature, was represented by the graduate program field, program modality, the region in which the program is located, and the type of educational institution. This information was analyzed using the Kruskal-Wallis test and is presented in Table 6.

Table 6
Kruskal-Wallis Test – Academic Characteristics

	Constructo / Dimensão	Field		Modality		Region	
		Kruskal-Wallis	Dif. Sig?	Kruskal-Wallis	Dif. Sig?	Kruskal-Wallis	Dif. Sig?
AJ	Academic Justice	0.253	No	0.12	No	0.005*	Yes
	Distributive Justice	0.143	No	0.444	No	0.365	No
	Procedural Justice	0.446	No	0.279	No	0.026*	Yes
	Interactional Justice	0.710	No	0.007*	Yes	0.000*	Yes
MACH	Machiavellianism	0.292	No	0.140	No	0.357	No
	Amoral manipulation	0.594	No	0.35	No	0.390	No
	Disbelief in Others	0.010*	Yes	0.394	No	0.298	No
	Desire for Control	0.698	No	0.014*	Yes	0.941	No
	Desire for Status	0.919	No	0.11	No	0.136	No

Nota. *p-value < 0.05; AJ: Belonging to the Academic Justice Construct (RCJS); MACH: Belonging to the Machiavelism Construct (MPS). KW: significance obtained in the Kraskall-Wallis Test.

Source: study's data.

The first test compares the respondents' academic characteristics according to the groups organized by the type of higher education institution. The test showed no statistically significant differences. Therefore, according to this study's results, there are no differences between the perception of justice and the Machiavellian trait among students attending public, private, or community institutions.

No significant differences were found between Academic Justice and the Machiavellian trait when comparing the difference between the constructs based on the field of knowledge (Administration, Accounting, and Economics). Nonetheless, the Distrust in Others dimension showed a significant difference between the Accounting and Economics programs: Accounting students presented higher distrust in others, a typical characteristic of Machiavellianism. This finding stands out if we consider that Distrust in Others is an element of mistrust that mirrors one's attitudes (Dahling, Whitaker & Levy, 2009).

Another characteristic investigated in this study, when comparing sociodemographic characteristics, refers to the region where the graduate program is located. The test revealed significant differences linked to the perception of fairness among students from different regions. The main differences between the Southeast and Northeast, and between the Southeast and Midwest, concerned the policies, procedures, and treatment dispensed by professors to students. According to the data collected, respondents from the Northeast, North, and Midwest regions showed lower perceptions of academic justice, highlighting the differences between regions related to interactional justice.

These differences corroborate the observations of Simil (2016) that sociodemographic characteristics (such as the region where individuals are inserted) must be observed when analyzing classroom justice, as the differences listed above show.

5. Conclusions

This study aimed to compare the differences in the perception of Academic Justice and the Machiavellianism trait among graduate students in the Business field, considering their sociodemographic characteristics. After applying the questionnaire to master's and doctoral students, the 334 valid responses were analyzed using the Kruskall-Wallis test.

This study's results indicate that graduate students in the Business field present significant differences in the perception of justice and the Machiavellian trait when specific groups are analyzed according to their sociodemographic characteristics.

An analysis of the respondents' gender showed that women feel more wronged in the processes adopted by professors and their interactions with faculty members than men. The analysis according to age indicates that younger individuals are more prone to the Machiavellian personality traits than older people, except in the Desire for control dimension, which may be related to the strategy and future vision of the Machiavellian personality; therefore, they tend to be more latent among young people.

Regarding the graduate programs, a minor difference was verified between the various groups, indicating that the type of educational institution does not change one's perception of Academic Justice or the Machiavellian trait.

The program's field showed a significant difference exclusively regarding the students' Distrust of others, showing that Accounting students are more suspicious than those in Business Administration or Economics programs. Comparisons between the graduate modalities showed a greater Desire for Control and a lower perception of interactional academic justice among academic master's and doctoral students. Geographically, students from the Northeast, North, and Midwest feel more wronged in their academic relationships, mainly regarding the processes adopted by the professors and the interpersonal treatments they dispense.

These results align with other academic findings and highlight the need for professors and teaching institutions to consider the students' personal aspects when implementing policies. It is important to remember the need for differentiated treatment for women attending graduate programs in the Business field, also considering the particularities of each Brazilian region, such as the Northeast, North, and Midwest.

In addition to considering a tendency of personality bias in the perception of Academic Justice, this study highlights the personality aspects of younger students, who present a more prominent Machiavellian profile, and their search for individual benefit reflected in their perception of Justice. A tendency to distrust others, such as professors and peers, was found specifically in the Accounting graduate program; hence, this study presents a prominent element of this program.

Despite the results and considerations presented here, this study has some limitations concerning its approach, especially considering the unfeasibility of further deepening the quantitative research beyond the pandemic period when the questionnaire was applied.

The possibilities for future research include a growing opportunity to understand different factors that can influence justice perception in the academic environment, besides behaviors, attitudes in the classroom, and the strategic development in the performance of students in the Business field that can be promoted among students with a more prevalent Machiavellianism trait.

References

Allport, G. W. (1961). Pattern and growth in personality. Oxford, England: Holt.

Alves, R. S., Puppin, L., Nascimento, E. M., & Da Cunha, J. V. A. (2019). Maquiavelismo e sua relação com atividades contraproducentes nos estudantes de Ciências Contábeis. Revista de Educação e Pesquisa em Contabilidade (REPeC), 13(1), https://doi.org/10.17524/repec.v13i1.2135

Berti, C., Molinari, L., & Speltini, G. (2010). Classroom justice and psychological engagement: Students' and teachers' representations. Social Psychology Of Education, 13(4), 541-556. doi:10.1007/s11218-010-9128-9

Bies, R. J., & Moag, J. S. (1986). Interactional justice: Communication criteria of fairness. In R. J. Lewicki, B. H. Sheppard, & M. H. Bazerman (Eds.), Research on negotiation in organizations (Vol. 1, pp. 43–55). Greenwich, CT: JAI Press.

Caglar, C. (2013). The Relationship between the Perceptions of the Fairness of the Learning Environment and the Level of Alienation. Eurasian Journal of Educational Research, 50, 185-206.

Christie, R., & Geis, F. L. (1970). Studies in machiavellianism. New York: Academic Press. Academic Press.

Chory-Assad, R. M. (2002). Classroom justice: Perceptions of fairness as a predictor of student motivation, learning, and aggression. Communication Quarterly, 50(1), 58-77.

Chory-Assad, R. M., & Paulsel, M. L. (2004a). Classroom justice: Student aggression and resistance as reactions to perceived unfairness. Communication Education, 53(3), 253-273.

Cooper, D. R., & Schindler, P. S. (2016). Métodos de Pesquisa em Administração-12ª edição. McGraw Hill Brasil.

Collison K. L., South S., Vize C. E., Joshua D. Miller & Donald R. Lynam (2021) Exploring Gender Differences in Machiavellianism Using a Measurement Invariance Approach, Journal of Personality Assessment, 103:2, 258-266, DOI: 10.1080/00223891.2020.1729773

Cropanzano, R., & Greenberg, J. (1997). Progress in organizational justice: Tunneling through the maze. International review of industrial and organizational psychology, 12, 317-372.

Dahling, J. J., Whitaker, B. G., & Levy, P. E. (2009). The development and validation of a new Machiavellianism scale. Journal of management, 35(2), 219-257.

Darnell J.A., Darnell, J.M. (2019) The Importance of Considering Socio-Demographic Factors in University Postgraduate Policies. Journal of Higher Education Policy and Management.

D'Souza, M. F. (2016). Manobras financeiras e o dark triad: o despertar do lado sombrio na gestão (Tese de Doutorado). São Paulo: Universidade de São Paulo.

D´Souza, M. F., & Jones, D. N. (2017). Taxonomia da rede científica do Dark Triad: revelações no meio empresarial e contábil. Revista de Educação e Pesquisa em Contabilidade, 11(3), p. 296-313.

D'Souza, M. F., & de Lima, G. A. S. F. (2018). Escolha de carreira: o Dark Triad revela interesses de estudantes de Contabilidade. Revista de Contabilidade e Organizações, 12.

D'Souza, M. F. & Lima, G. A. S. F. (2019). Um olhar sobre os traços do Dark Triad e os valores culturais dos estudantes de contabilidade. Advances in Scientific & Applied Accounting, 12(1).

D'Souza, M. F. (2020). RESPONSABILIDADE SOCIAL CORPORATIVA MODERA A RELAÇÃO ENTRE O TRAÇO MAQUIAVÉLICO E O GERENCIAMENTO DE RESULTADOS?. *Revista De Educação E Pesquisa Em Contabilidade (REPeC)*, *14*(4). https://doi.org/10.17524/repec.v14i4.2661

Deutsch, M. (1975). Equity, equality, and need: What determines which value will be used as the basis of distributive justice? Journal of Social issues, 31(3), 137-149.

Fávero, L. P., & Belfiore, P. (2017). Manual de análise de dados: estatística e modelagem multivariada com Excel®, SPSS® e Stata®. Elsevier Brasil.

Furnham, A., Richards, S. C., & Paulhus, D. L. (2013). The Dark Triad of personality: A 10 year review. Social and personality psychology compass, 7(3), 199-216.

Greenberg, J. (2001). Setting the justice agenda: Seven unanswered questions about "what, why, and how". Journal of Vocational Behavior, 58(2), 210-219.

Grohmann, M. Z., & Battistella, L. F. (2012). A Escala de Personalidade Maquiavélica (MPS): Tradução e validação no contexto brasileiro. Psicologia Argumento, 30(70).

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. Academy of management review, 9(2), 193-206.

Homans, G. C. (1961). The humanities and the social sciences. American Behavioral Scientist, 4(8), 3-6.

Jones, D. N., & Paulhus, D. L. (2009). Machiavellianism. In M. R. Leary & R. H. Hoyle (Eds.), Handbook of individual differences in social behavior (pp. 93–108). The Guilford Press.

Jones, D. N., & Paulhus, D. L. (2011). Differentiating the dark triad within the interpersonal circumplex. In L. M. Horowitz, & S. Strack. Handbook of interpersonal psychology (pp. 249-269). New York: Wiley & Sons.

Jones, D. N., & Paulhus, D. L. (2014). Introducing the Short Dark Triad (SD3): A Brief Measure of Dark Personality Traits. Assessment, 21(1), 28–41.

Leventhal, G. S. (1976). The distribution of rewards and resources in groups and organizations. In L. Berkowitz E. Walster (Eds.), Advances in experimental social psychology (Vol. 9). NewYork: Academic Press.

Major, B., & Deaux, K. (1982). Individual differences in justice behavior. In Equity and justice in social behavior (pp. 43-76). Academic Press.

Rasooli, A., Zandi, H., & DeLuca, C. (2019). Conceptualising fairness in classroom assessment: exploring the value of organisational justice theory. Assessment in Education: Principles, Policy & Practice, 26(5), 584-611.

Resh, N., & Sabbagh, C. (2016). Justice and education. In C. Sabbagh & M. Schmitt (Eds.), Handbook of social justice theory and research (pp. 349–368). Berlin: Springer.

Sampieri, R. H., Collado, C. F., & Lucio, M. del P. B. (2013). Metodologia de pesquisa (5o). Porto Alegre: Penso.

Sanches, A. C. P. (2016). Experiências de (in) justiça com os professores e comportamentos de desvio na adolescência. Tese de Programa Operacional Ciência e Inovação – Fundação para a Ciência e Tecnologia.

Santos, D., Avelino, B. C., da Cunha, J. V. A., & Colauto, R. D. (2020). Justiça e desonestidade acadêmica: um estudo com estudantes do curso de ciências contábeis. Revista Contemporânea de Contabilidade, 17(44), 71-86.

Shi, J., Lin, H., Wang, L., & Wang, M. (2009). Linking the big five personality constructs to organizational justice. Social Behavior and Personality: an international journal, 37(2), 209-222.

Simil, A. S. (2016). A confiança como fator de influência da percepção de justiça no ambiente de aprendizagem. Dissertação. Centro de Pós-Graduação e Pesquisas em Contabilidade e Controladoria. Universidade Federal de Minas Gerais, Brasil.

Törnroos, M., Elovainio, M., Hintsa, T., Hintsanen, M., Pulkki-Råback, L., Jokela, M., & Keltikangas-Järvinen, L. (2019). Personality traits and perceptions of organisational justice. International journal of psychology, 54(3), 414-422.

Tyler, T. R., Boeckmann, R. J., Smith, H. & Huo, A.Y. J. (1997). Social justice in a diverse society. Colorado: Westview Press.

Wang, Q., Hackett, R. D., Zhang, Y., & Cui, X. (2019). Personal characteristics and applicants' perceptions of procedural fairness in a selection context: The mediating role of procedural fairness expectations. Management Decision.

Wubbels, T., & Brekelmans, M. (2005). Two decades of research on teacher–student relationships in class. International journal of educational research, 43(1-2), 6-24.

Yılmaz, S. A. (2015). A new momentum: Gender justice in the women's movement. Turkish Policy Quarterly, 13(4), 107-115.

Zettler, I., & Solga, M. (2013). Not enough of a 'dark'trait? Linking Machiavellianism to job performance. European Journal of Personality, 27(6), 545-554.

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, art. 6, p. 219-241, Apr./Jun. 2023 | DOI: http://dx.doi.org/10.17524/repec.v17i2.3273 | ISSN 1981-8610

The Impact of IFRS 15 – Revenue from Contracts with Clients – on the Explanatory Notes of Publicly Traded Companies in Brazil

Laissa Gama Vieira
https://orcid.org/0000-0002-7531-8123

Bruno Meirelles Salotti
https://orcid.org/0000-0002-2735-7048

Raquel Wille Sarquis
https://orcid.org/0000-0002-9267-9588

Abstract
Objective: This study's objective was to analyze the quality of explanatory notes transitioning to the IFRS 15 in Brazil by comparing effects estimated in 2017 and those that effectively occurred in 2018; developing an Explanatory Notes Quality Index – the *Índice de Qualidade das Notas Explicativas (IQNE);* and describing the significant effects.
Method: 429 companies from the Brazilian market were assessed by comparing the explanatory notes concerning the effects caused by the IFRS 15. Such effects were classified according to the impacts expected in 2017 and recorded on the explanatory notes or the lack of them. Such expected effects were compared to the effects that effectively occurred in 2018 to see if they were greater or smaller than the estimated or not reported. The Explanatory Notes Quality Index was developed.
Results: More than half of the companies only reclassified accounts for a better presentation of information, increased the disclosure of explanatory notes, or did not report any impact caused by adopting the IFRS 15. Even though the standard did not cause significant impacts on most companies, some sectors, such as public utility, communication, non-cyclical stocks, industrial goods, and civil construction, were considerably impacted. Finally, the companies presented good quality information in the transition notes; 45% of the sample obtained the highest IQNE.
Contributions: This study is relevant as it reports the effects of the transition to the IFRS 15 in Brazil, which supports the discussion on how companies deal with the adoption of a new standard regarding its previous preparation and analysis of the effects that effectively occurred. Therefore, it contributes to academia, but mainly to those using accounting information and regulating bodies, such as Iasb, during the Post-Implementation Review (PIR) of IFRS 15.
Keywords: IFRS 15; Explanatory Notes; Revenues; Accounting Information; Quality.

Published in Portuguese and English. Original Version in Portuguese.

Round 1: Received in 3/20/2023. Review requested on 3/5/2023. Round 2: Resubmitted on 4/3/2023. Accepted on 4/10/2023 by Vinícius Gomes Martins, PhD (Editor assistant) and by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 6/30/2023. Organization responsible for the journal: Abracicon

1. Introduction

Accounting information has a fundamental purpose, that of being useful for decision-making, and to be useful, information must be relevant and make a difference in users' decisions (CPC – 00 (R2), 2020; Hendriksen & Breda, 1999; Iudícibus, 2015).

However, due to economic development, the growth of markets, and the advancement of the accounting field, financial statements became increasingly complex and sizeable (Cheung & Lau, 2016; Morunga & Bradbury, 2012; Richards & Staden, 2015), affecting how accounting information is used and understood (Boubaker, Gounopoulos, & Rjiba, 2019). Explanatory notes are central in this discussion because they contain the largest amount of information conveyed by financial reports and provide the information that facilitates understanding financial statements (Lourenço, 2014).

In 2014, the Brazilian Accounting Pronouncements Committee issued OCPC 7 in an attempt to convince those preparing such reports to pay greater attention to explanatory notes and decrease the considerable amount of irrelevant information provided in such notes (Flores, Santos, & Carvalho, 2015). Iasb is also developing a project to discuss improved disclosure (the Disclosure Initiative) among international bodies, such as the European Financial Reporting Advisory Group (EFRAG).

Glaum et al. (2013) addressed the effect of adopting IFRS on the accuracy of analysts' projections and verified that the quality of explanatory notes is relevant for analysts. Additionally, explanatory notes have been the object of various theoretical and empirical studies, both in Brazil and internationally, corroborating the importance of such information (Healy & Papelu, 2001; Verrecchia, 2001; Salotti & Yamamoto, 2005; Murcia & Santos, 2009; Merkley, 2014; Moreno & Casasola, 2016).

In this context, one of the main accounting standards issued by Iasb in the last decade was IFRS 15 – Revenue from Contracts with Customers. In addition to impacting the amounts reported by companies in the main line of the Income Statement for the Year (DRE), IFRS 15 also has the potential to increase the volume of information disclosed in explanatory notes; hence, it is pertinent to study this standard in this context.

IFRS 15 was issued in May 2014, and became effective from January 1st, 2018, to consolidate and replace previous regulations and interpretations (IAS 11, IAS 18, IFRIC 13, IFRIC 15, IFRIC 18, and SIC- 31). Specifically, IFRS 15 establishes principles for measuring, recognizing, and disclosing revenues (IFRS, 2014). In Brazil, its correlated standard was established on November 14th, 2016, through Technical Pronouncement CPC 47 – Revenue from Contracts with Customers.

Most studies addressing the adoption of IFRS 15 assess the effect of the amounts reported by companies (Napier & Stadler, 2020; Silva et al., 2021) on the level of compliance with disclosure requirements (Boujelben & Kobbi-Fakhfakh, 2020; Moraes da Silva & Gonzales, 2022; Silva & Pierri Junior, 2021), the relevance of accounting information (Braga, Nascimento, & Santos, 2022; Dani, Santos, Panucci Filho, & Klann, 2017; Onie et al., 2022), and at the earnings management level (Baldissera et al., 2018; Morawska, 2021; Piosik, 2021; Souza, Gonçalves, & Tibúrcio, 2022).

This study explores the effect of IFRS 15 on the disclosure of accounting information in explanatory notes using a different perspective from the previous literature, i.e., explanatory notes transitioning to the new standard. This discussion is pertinent, considering that IFRS 15 was issued almost four years before it entered into effect in 2018. As a result, IAS 8 (and, in Brazil, CPC 23) requires that companies report when they apply a new standard that has already been published but has yet to enter into force. Additionally, companies are supposed to provide the relevant information in the explanatory notes to assess the potential impact of such implementation on financial statements. Therefore, those companies that made such estimates disclosed (or were expected to disclose) the estimated impact from the application of the new standard beginning in January 2018 in explanatory notes when they prepared their balance sheets in the years prior to the standard entering into effect.

Therefore, based on the analysis of the impact of the new standard on financial statements' figures and information disclosed before and after the adoption of IFRS 15, the objective is to compare estimated with actual effects to answer the following research question: **What is the quality of explanatory notes transitioning to IFRS 15?**

Therefore, three main objectives were established: 1) assess whether the estimated effects disclosed by companies in the financial statements published before the adoption of IFRS 15 (2017) were confirmed in the first financial statements published after the standard came into force (2018); 2) measure the quality of accounting information disclosed in the IFRS 15 transitioning explanatory notes, using the *Índice de Qualidade das Notas Explicativas (IQNE)* [Explanatory Note Quality Index]; and 3) describe the significant impacts after companies adopted the IFRS 15. By achieving these three objectives, this study will provide evidence to assess the quality of information disclosed by companies when adopting a new standard (in this case, IFRS 15) before and after its effective transition.

This study's results are expected to contribute not only to academia but also to those using accounting information and regulatory bodies as well. Specifically, this study will add to the literature on the adoption of IFRS 15 by exploring an aspect that, thus far, has not been analyzed: the quality of information disclosed in explanatory notes transitioning to IFRS 15. Additionally, this study's results might be helpful to those using accounting information, as they indicate whether the information disclosed initially by a company when estimating the impact of new accounting standards is verified when the standard is effectively adopted. Such information contributes to the users' assessments and projections, consequently favoring decision-making. Finally, this study will also contribute to regulatory bodies, such as the Iasb, by providing information on the effects of adopting a new standard, which may be helpful during the IFRS 15 Post-Implementation Review (PIR) process.

2. Theoretical framework

This section is divided into three main topics. Topic 2.1 addresses the importance of disclosing accounting information and the process of preparing explanatory notes. Topic 2.2 presents the history and main changes brought about by the IFRS 15. Finally, topic 2.3 describes the primary studies addressing this subject and shows a gap in the literature this study seeks to fill.

2.1. Accounting Information and Explanatory Notes

The quality of accounting information is paramount because people and companies use such information as a source for decision-making. Its purpose is to serve different users mainly interested in the companies' economic performance, profitability, cash generation potential, and the continuity of activities (Nascimento & Reginato, 2008). Information provided to users is based on the accounting process of recognition, measurement, and disclosure (Lopes & Martins, 2005).

Therefore, for financial statements to be useful for users outside a company, they must contain relevant and trustworthy information (CPC 00 R2). As a result of the reconciliation between Brazilian accounting practices and international standards (IFRS), Laws No. 11,638, from December 28th, 2007, and No. 11,941, from May 27th, 2009, introduced changes to Law No. 6,404, from December 15th, 1976, to modify the set of financial statements companies prepare. According to Pronouncement CPC 26 (R1), this set of financial statements includes explanatory notes comprising meaningful accounting policies, information comparing to the previous period, and other explanatory elements.

Explanatory notes are essential to improve the quality of accounting information, as they provide information complementing financial statements. Such notes can be descriptive, presented in analytical charts, or even encompass other financial statements necessary to clarify an entity's economic and financial situation (Diniz et al., 2018).

A more significant amount of information is currently required in explanatory notes due to the adoption of new accounting practices, increasing informational content. This fact occurred because Brazilian accounting became based on principles, no longer tied solely to tax rules. As a result, accountants assumed the responsibility to clearly explain the various relevant circumstances that affected each account in a financial statement, and the explanatory notes are the most appropriate place for this (Antunes et al., 2012; Diniz et al., 2018).

There is empirical evidence that the disclosure of accounting information decreases information asymmetry between managers and investors and, consequently, allows for increased stock liquidity and decreased volatility and cost of capital (Healy & Palepu, 2001; Shroff, Sun, White, & Zang, 2013; Zhou, 2007). However, the benefits obtained by disclosing such information must outweigh its direct and indirect costs (Lourenço, 2014).

As part of the financial statements currently required by CPC 26 (R1), the explanatory notes must include information required by the IFRSs (or CPCs, in Brazil), provided that these are applicable and the respective information is relevant. Thus, only certain information required by the rules should be disclosed. However, many companies, fearing lawsuits or being confronted, are induced to disclose excessive information in this report, decreasing its relevance and usefulness (Lourenço, 2014).

Accordingly, Flores et al. (2015) state that, in general, companies comply with the obligations required by IAS/IFRS but do not consider how beneficial such information is to their users.

On the other hand, some companies intentionally omit information to hide elements that may negatively influence external users. Thus, they keep strategic information, which can translate into a competitive disadvantage or even cause third parties to contest the value of the company and its contractual relationship with it. For this reason, the Accounting Pronouncements Committee (CPC) issued, in September 2014, Technical Guidance OCPC 7 – *Evidenciação na Divulgação dos Relatórios Contábil-Financeiros de Propósito Geral* [Evidence in the Disclosure of General Purpose Accounting and Financial Reports] to solve such issues (Lourenço, 2014; Martins, 2014).

When analyzing the current rules on information disclosure, especially in explanatory notes, CPC concluded that there were already sufficient guidelines instructing how to prepare them. Therefore, its primary purpose was to clarify and reinforce that only relevant information contributing to users' analyses and decision-making should be disclosed in financial reports (Martins, 2014).

2.2 IFRS 15 general aspects – revenue from contract with customers

IFRS 15 is one of the primary standards issued by the Iasb in the last decade. The relevance of IFRS 15 is that any change it proposes affects all companies' main line of the Income Statement for the Year (DRE). Additionally, IFRS 15 impacted not only the amounts reported but also changes in the companies' business models and internal controls.

Regarding its history, IFRS 15 was issued in 2014 to heed users' complaints, wishes, and concerns. As it is entirely based on principles, this standard provides a model of five didactic steps for recognizing and measuring revenues (Gelbcke, Santos, Iudícibus, & Martins, 2018). IFRS 15 was approved in Brazil on November 14th, 2016, with a corresponding Brazilian accounting standard, Technical Pronouncement CPC 47, though only on January 1st, 2018, it became effective.

The standard creates a single model for accounting for revenue from contracts with customers, regardless of the business sector or the nature of the transactions. Note that although IFRS 15 and, consequently, CPC 47, caused several controversies and debates regarding its application, the principles included in its scope were already expressed in the accounting standards replaced by this technical pronouncement. For this reason, this new standard provides more details regarding the recognition, measurement, and recording of revenues without changing the essential assumptions (Pinto et al., 2020).

Specifically, IFRS 15 brings a five-step model to identify, recognize, and measure revenues from commercial operations: (1) Identifying the contract with a customer; (2) Identifying performance obligations; (3) Determining the transaction price; (4) Allocating the transaction price to performance obligations; and (5) Recognizing revenue when (or as) the obligation is satisfied. These steps, in turn, are not necessarily sequential and may even co-occur. The definition provided by this standard is intended to be more comprehensive, clear, and didactic so that accounting information is more coherent and uniform, meeting the qualitative characteristics of useful financial information as established in the Conceptual Framework R2 (Gelbcke et al., 2018; Pinto et al., 2020).

IFRS 15 affected all companies, but differently. The effect would be less relevant for some companies, though changes would be more significant for others. Therefore, adopting IFRS 15 represented a significant advance for accounting because it addresses the revenue recognition process for all segments. Hence, it is a highly relevant change, as in addition to directly affecting the most critical component of the companies' results, it also shows an interpretative nature of the standard and the operation itself. According to Kreston Partnership (2016), the complexity of its adoption varies according to the industry segment and the structure of organizations' internal controls.

According to Gelbcke et al. (2018), IFRS 15 establishes, as a basic principle, that entities must recognize revenues to reflect the transfer of goods or services to customers, in an amount that reflects the compensation such an entity expects to receive in exchange for those goods or services. In this sense, revenue recognition is highly connected to the fulfillment of an obligation (or performance).

This new concept introduced by IFRS 15 shows that the selling entity complies with its obligation to transfer control of the good or service to the purchasing entity through a contract. In standards before the IFRS 15, what is now understood to be an obligation would be fulfilled with the transfer of risks and benefits, at which point revenue would be recognized in the accounts. After implementing the new standard, this process occurs when the seller transfers control to the buyer. As it is more comprehensive, for some segments, this concept should have a temporal effect on the recognition of accounting revenue (EY, 2014).

Regarding the transition model, due to the various conceptual changes and changes of a practical nature introduced by the new standard in all its steps, companies could choose between retrospective full adoption and modified retrospective adoption.

Under CPC 23, the full retrospective application consists of the company adjusting the opening balance of each component of equity affected considering the earliest prior period presented and other comparative amounts disclosed for each prior period presented, as if the new accounting policy had always been applied, thus enabling comparisons between the entity's financial statements.

In the case of applying the modified retrospective method, the entity shall recognize the cumulative effect of the initial application of the standard as an adjustment to the opening balance of retained earnings (or another component of equity, as appropriate) for the reporting period that includes the date of initial application. When considering this method, an entity may choose to only apply the new standard to contracts that were not completed at the date of the initial application of the standard.

2.3 Empirical Evidence on the Adoption of IFRS 15

When a new accounting standard is issued, academia and researchers play an important role in the search for empirical evidence on the effects and consequences of the changes proposed to contribute to regulatory bodies. Thus, in recent years, several researchers have studied the impacts arising from the adoption of IFRS 15.

Part of these studies sought to assess the effect of adopting IFRS 15 on the values reported by companies (Napier & Stadler, 2020; Silva et al., 2021) and verified that only some sectors verified material effects. Napier & Stadler (2020), for example, surveyed 48 companies in the European market, and the results showed that its impact on accounting numbers was minimal for most companies, except in some sectors, such as telecommunications.

One of the main effects expected of adopting IFRS 15 was an increase in the volume and quality of information disclosed in explanatory notes concerning the process of recognizing and measuring revenues. In this sense, Boujelben & Kobbi-Fakhfakh (2020) assessed the degree of compliance with the mandatory disclosures of IFRS 15 in a sample of companies in the construction and telecommunications sectors in the European Union. The results showed that the companies did not fully comply with mandatory disclosures, with the degree of compliance differing between the two sectors. Moraes da Silva & Gonzales (2022) found similar results in Brazil. Silva & Pierri Junior (2021) analyzed the level of adherence to CPC 47 requirements in five Brazilian companies in the telecommunications sector and identified diverse degrees of adherence to disclosure items and impacts resulting from adopting the new standard in four of the five companies.

From the perspective of effects on the capital market, Onie et al. (2022) assessed the impact of IFRS 15 on the value relevance of financial reports of publicly traded companies in the Australian market. The impact of the transition was immaterial in most companies; however, some companies experienced a significant decrease in earnings relevance. There is little evidence that the new standard has increased earnings relevance after adopting the standard. In Brazil, however, evidence was found that adopting IFRS 15 increased the relevance of accounting information among companies in the civil and heavy construction sectors (Braga, Nascimento, & Santos, 2022).

Still from the perspective of the relevance of accounting information, Dani, Santos, Panucci Filho, and Klann (2017) assessed the voluntary early adoption of IFRS 15 in Brazil, addressing a sample of 15 civil construction companies listed on B3, and concluded that early voluntary adoption impacted stock prices and, therefore, was relevant for the capital market.

Because IFRS 15 is firmly based on principles, it increased the discretionary power of managers, demanding greater professional judgment. Therefore, a very fruitful line of research sought to assess the effect of adopting IFRS 15 on earnings management (Baldissera et al., 2018; Morawska, 2021; Piosik, 2021; Souza, Gonçalves, & Tibúrcio, 2022). Specifically in the Brazilian market, Souza et al. (2022) found evidence that the adoption of IFRS 15 decreased the quality of accruals and increased earnings management, especially in some specific sectors. Baldissera et al. (2018) reached a similar conclusion.

In summary, most studies sought to assess the effects of IFRS 15 on the values reported, compliance with disclosure requirements, value relevance, and earnings management. There is, therefore, a need for studies assessing the quality of the explanatory note for the transition to IFRS 15, comparing the estimated effects on the financial statements before adoption with the actual effects reported in the first financial statements after the IFRS 15 came into effect. This study seeks to fill this gap in the literature.

3. Method

3.1 Methodological Classification

This study proposes a reflection on the quality of accounting information, especially regarding explanatory notes considering the implementation of the new accounting standard IFRS 15. From this perspective, the objective is to address the objectives proposed and investigate them in greater depth using a qualitative-quantitative approach.

As for the procedures, documental research was used, in which the primary source of data collection was corporate financial reports (Marconi & Lakatos, 2003).

3.2 Sample characterization

The sample comprised all publicly traded companies listed on B3 in 2017 that remained with assets on the market in 2018, totaling 429 companies.

Table 1 presents the sectors in which the companies in the sample operate.

Table 1
Companies' business sectors

Business sector	Total No. of companies
Industrial goods	70
Communication	6
Consumer Cyclical Stocks	79
Non-Cyclical Stocks	27
Financial	87
Basic Material	32
Oil, Gas, and Biofuels	11
Healthcare	19
Information Technology	6
Public Utility	67
Others	25
Total	429

Source: developed by the authors

Note that given the objective of analyzing the quality of the explanatory notes specifically related to the adoption of IFRS 15 in Brazil, extending the analysis period would not be relevant because this standard was issued in Brazil (through CPC 47) only at the end of 2016. Hence, it would not make sense to analyze 2016 or the years prior to 2016, as the standard was approved at the end of that year. Likewise, analyzing data from years after 2018 would not be relevant because, from that year forward, the standard had already been adopted. For this reason, the explanatory notes would not specifically provide data that would enable comparisons between the new and old standards.

3.3 Data Collection

The explanatory notes of the 429 companies were compared to investigate whether IFRS 15, which had been issued but was not yet in force, had been adopted. Therefore, these companies' websites were consulted, and the respective annual financial statements, including the explanatory notes, were manually collected. The explanatory notes from before (2017) and after (2018) the standard came into force and mentioned its implementation were selected to understand better the relevance and usefulness of the information provided.

3.4 Result Analysis

The comparative method was chosen to study the similarities and differences between the samples concerning the periods under analysis. Thus, to enable such an analysis, the impacts each of the companies estimated in 2017 and then recorded in 2018 (in the explanatory notes) after the standard came into force were first classified into the following categories:

Table 2
Criteria to classify the impacts

Classification*	Classification criteria
Not reported	Companies that did not mention, in the explanatory notes of their 2017 financial statements, the potential effects of the adoption of IFRS 15 as of January 1st, 2018. Companies that did not mention, in the explanatory notes of their 2018 financial statements, whether the adoption of the IFRS 15 caused any or no significant impact.
Uncertain	Companies that in 2017 were assessing the potential effects of adopting the IFRS 15 on their financial statements and accounting disclosures. Companies that continued assessing the potential effects of the adoption of the IFRS 15 on their financial statements and accounting disclosures even after having adopted the standards as of January 1st, 2018.
None	Companies that, in 2017, did not expect any significant impact on their financial statements from adopting the IFRS 15. Companies that, in 2017, did not report or expected any potential impact on their financial statements from adopting the IFRS 15 or were still assessing potential impacts, and after adopting the standard in 2018, confirmed that no significant impacts were identified.
Some	Companies that in 2017 studied the new standard and verified that it would have some impact on their financial statements after it came into effect. Companies were still studying the potential effects in 2018 but recorded impacts after adopting the standard as of January 1st, 2018.
Expected	Companies that, in 2017, correctly estimated impacts or no impacts would be caused by the IFRS 15 and companies that did not estimate any impact and verified no impacts in 2018. Note that we did not verify the exact estimated amount, but rather, the accounts and contracts affected and how they impacted the companies' financial statements.
Major	Companies that, in 2018, recorded an impact greater than expected in 2017; i.e., the expected impact occurred, but more accounts and/or contracts than previously expected were affected when the IFRS came into effect.
Minor	Companies that, in 2018, recorded an impact smaller than expected in 2017; i.e., the expected impact occurred, but fewer accounts and/or contracts than previously expected were affected when the IFRS came into effect.

*The categories "not reported", "none", and "some" were adopted in both periods, i.e., they were used to classify the impacts in 2017 and 2018. The categories "expected", "minor", and "major" were used only to classify the impacts reported in 2018 as they refer to impacts expected in 2017 and serve as a base for comparison.

Source: developed by the authors.

We established and revised these criteria based on the analysis of the object to be studied (impacts of the adoption of IFRS 15). Obviously, as noted in section 5, this imposes limitations as the results depended on the authors' judgments.

We developed an Explanatory Notes Quality Index (*IQNE*) based on the logic proposed by Gabriel (2011)[1] to compare the estimated qualitative impacts with impacts that occurred, adapting the questions to the object addressed here, i.e., impacts resulting from adopting IFRS 15. Thus, four objective questions were asked to develop the *IQNE*. These questions were intended to facilitate comparing the relevance and reliability of the information provided in the financial reports from 2017 and 2018. The first two questions concern the disclosure prior to the standard, which, despite being approved, was not yet in force. The two last questions refer to the impacts caused by the standard and the quality of the information provided before it, and the two first questions concern disclosures prior to the standard and the quality of information previously provided.

1 The rationale proposed by Gabriel (2011) consisted in choosing 12 questions related to the object of study – Quality of Accounting Information – and establishing criteria to rate answers to each question. Accordingly, by calculating each company's total score, the above author obtained a proxy for the quality of accounting information.

Depending on the question, an affirmative answer (verified via a set of accounting statements available to the public) is scored from 0.5 to 2 points. Thus, a company can obtain an *IQNE* from 0 to 5; the higher the index, the greater the quality of the accounting information. Table 3 presents the objective questions adopted in the development of the Índice *de Qualidade das Notas Explicativas (IQNE)* [Explanatory Notes Quality Index].

Table 3
Questions Considered in the Development of the Índice de Qualidade das Notas Explicativas (IQNE)

Question	Justification	Score
1) Does the company mention the IFRS 15 in the 2017 financial statements as a new standard to be adopted in 2018?	IAS 8 – Accounting Policies, Change of Estimates and Errors (in Brazil, CPC 23) establishes that a company must disclose in its explanatory notes when it does not adopt in advance a newly issued IFRS (though not still mandatory) and provide information regarding the expected impacts caused by its application.	1 – The company mentioned the IFRS 15 as a new standard to be adopted starting in 2018. 0 – The company did not mention the IFRS 15 as a new standard to be adopted starting in 2018.
2) Does the company report, in 2017, the potential effects of the IFRS 15 adoption?	According to IAS 8, one of the topics that must be addressed concerns assessing potential impacts on financial statements resulting from the standard's application. If the impact is still unknown or not estimable, explain the reason for such impossibility.	1 – The company estimated the potential effects of adopting the IFRS 15. 0.5 – The company was still estimating the potential effects of adopting the IFRS 15. 0 - The company did not report the potential effects of adopting the IFRS 15.
3) Does the company report, in its 2018 financial statements, the impacts caused by the adoption of the IFRS 15?	When the standard comes into effect, IAS 8 establishes that the company must determine any existing effects on the current period, reporting the standard title, the nature of the change in accounting policy, the transitional provisions adopted, the adjustment values for the current and previous periods and, also, if the required retrospective application is impracticable for a given period, explain why.	1 – The company reported the effects caused by the adoption of the IFRS 15. 0.5 – The company was assessing the effects caused by the adoption of the IFRS 15. The company did not report the effects caused by the adoption of the IFRS 15 or only described the standard.
4) Do the impacts reported in 2018 confirm the impacts estimated in 2017?	The main objective of financial accounting is to provide its users, especially external users, with helpful information that allows them to assess the present and future economic and financial situation of a supplier company (CPC 00 R2). Financial statements must contain relevant information that is faithfully represented to be helpful to users external to the company (CPC 00 R2). • **Relevance:** Relevant financial information makes a difference in users' decisions. • **Reliable Representation:** Reliable information is complete, neutral, and error-free. Due to this question's qualitative nature, greater weight was attributed to its answers.	2 – The impacts reported confirm the impacts estimated in 2017. 1 – The impacts reported partially confirm the impacts estimated in 2017. 0 – The impacts reported do not confirm the impacts estimated in 2017 or were not reported.

Source: developed by the authors.

Cronbach's alpha, which ranges from 0 to 1, was used to validate the *IQNE*; the closer to 1, the greater the scale's reliability; the alpha was equal to 0.73, considered satisfactory in Social Sciences studies.

As reported in sub-item 4.3.4, the *IQNE* was empirically validated. Additionally, the results obtained in the *IQNE* by the companies in this study's sample were compared with those of the companies awarded the Anefac-Fipecafi-Serasa Experian Transparency Trophy. The results confirm the index consistency.

In addition to comparing the estimated effects with the effects that occurred, we verified the numbers and the impacts the companies reported due to the adoption of the new accounting standard for recognizing revenue from contracts with customers. The objective was to assess the actual impacts caused by adopting IFRS 15 in Brazil and which sectors were the most affected.

4. Analysis of results

This section presents the analysis of results and the limitations of the methodology adopted to assess, through empirical evidence, whether the expected impacts (reported by explanatory notes in 2017 statements) occurred partially, entirely, or were not verified when the standard was effectively adopted as of January 1st, 2018. This analysis is intended to examine the usefulness, relevance, and reliability of the explanatory notes released by companies on the impacts resulting from the adoption of IFRS 15.

4.1 Classification of expected impacts (in 2017) and actual impacts (in 2018)

Table 4 summarizes a comparison of the impacts estimated in 2017 and recorded after the IFRS 15 came into effect in 2018.

Table 4
Comparison between estimated impacts (2017) and actual impacts (2018) after adopting the IFRS 15/CPC 47

2017 \ 2018	Not reported	Uncertain	None	Some	Expected	Minor	Major	Total
Not reported	45	1	23	-	-	-	-	**69**
Uncertain	10	5	36	10	-	-	-	**61**
None	29	2	-	-	152	-	44	**227**
Some	2	-	5	-	41	4	20	**72**
Total	**86**	**8**	**64**	**10**	**193**	**4**	**64**	**429**

Source: developed by the authors.

Forty-five out of the 69 companies not mentioning the potential effects of adopting IFRS 15 in 2017 continued not reporting any effects of the standards in 2018; 23 did not identify relevant impacts; and only one company continued assessing the potential impacts. Therefore, for this subset of companies, not reporting any potential impacts of the IFRS 15 in 2017 is likely associated with the non-existence of any impacts arising from the standard's adoption.

Among the subset of 61 companies assessing the effects of CPC 47/IFRS 15 on their accounting statements in 2017, 36 did not identify any relevant impact after they adopted the standard on January 1st, 2018; 10 companies, despite not having initially foreseen any impacts, reported impacts after adopting the standard; 10 companies did not report whether the standard caused any impact; and the 15 remaining companies continued assessing the potential impacts. Hence, there was uncertainty in 2017 about the potential impacts the IFRS 15 would cause, but most companies in this category did not report impacts in 2018.

Moreover, 152 of the 227 companies in 2017 did not expect material impacts and, in fact, did not identify significant impacts after adopting the standard in 2018; 44 recorded some impact; 29 did not report whether the adoption of the standard caused any relevant impact; and only two companies, which initially did not expect any impacts, in 2018 reported that they were assessing potential impacts. Hence, it was clear in 2017 that no impacts would arise from the IFRS 15 in this subset comprising more than half of the companies in the sample; this finding was confirmed in approximately 2/3 of the cases (152 out of a total of 227).

Finally, of the 72 companies that identified in 2017 that IFRS 15 would cause some impact on their financial statements, 41 companies correctly estimated the effects caused by the adoption of IFRS 15; 20 companies recorded an impact more significant than expected in 2017; five companies did not identify relevant impacts after adopting the standard in 2018; four companies recorded an impact smaller than expected; and only two companies did not mention whether the adoption of the IFRS 15 caused any relevant impact. Hence, more than half of the companies in this subgroup correctly predicted what would happen in 2018.

An analysis of the level of errors in the 2017 forecast considering the actual impacts in 2018 showed that the errors are classified under columns "some", "minor" and "major", totaling 78 companies, i.e., 18.2% of the cases. Therefore, approximately 1/5 of the companies failed to predict the impacts that would occur in 2018 correctly. Despite the low percentage of incorrect forecasts, these companies might not be prepared to adopt IFRS 15 effectively.

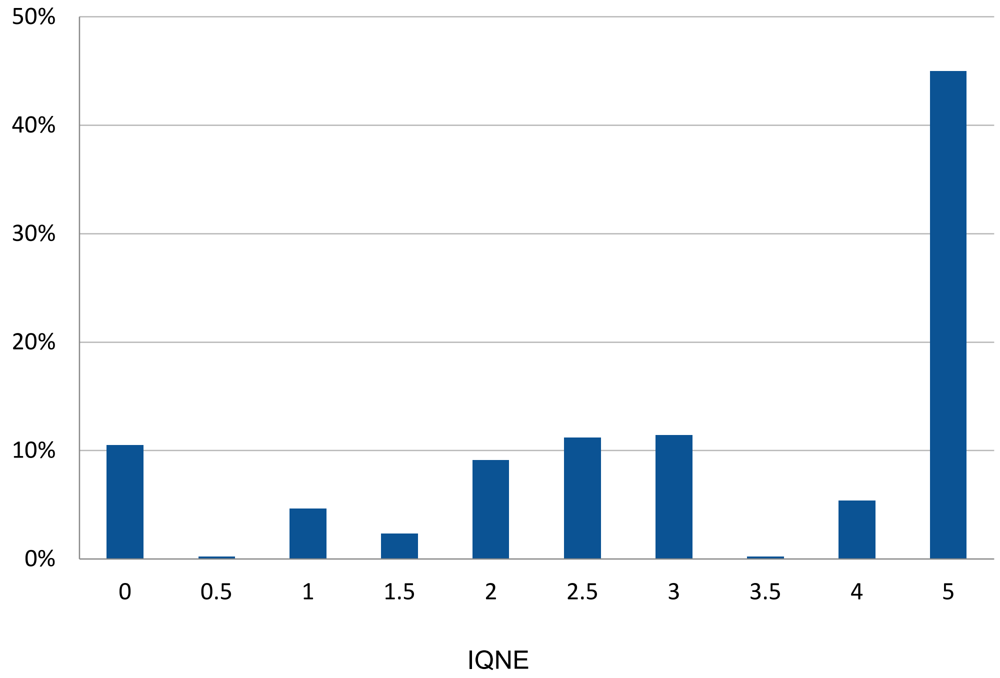
4.2 Development of the Explanatory Notes Quality Index (*IQNE*)

According to Table 5, the mean *IQNE* was 3.359, considered reasonable, and the standard deviation of 1.746 suggests that the distribution is dispersed around the mean, as shown in Graph 1.

Table 5
Descriptive statistics concerning the Explanatory Notes Quality Index (IQNE)

Variable	Mean	Standard deviation	Median	Sample (companies)
IQNE	3.359	1.746	3.048	429

Source: developed by the authors.



Graph 1. Histogram of the Explanatory Notes Quality Index (IQNE)

Source: developed by the authors.

Graph 1 indicates that 45% of the companies obtained the maximum IQNE; i.e., these companies reported in the 2017 financial statements that the IFRS 15 would be adopted on January 1st, 2018, and mentioned the potential effects arising from its adoption. These companies also reported in the 2018 financial statements the impacts that occurred and which coincided with the impacts estimated in 2017. Nevertheless, 10.72% of the companies in the sample did not report any predictions or impacts.

Additionally, the distribution of the companies' *IQNE* is asymmetrically positive. Not by chance, approximately 70% of the companies obtained an index between 2.5 and 5.

A potential explanation for these results is that the IFRS 15 was issued approximately four years in advance; hence, the companies had sufficient time to assess and measure potential impacts and adequately disclose such impacts in the explanatory notes. Another potential explanation is that, as documented by the literature addressed in section 2.3, no significant impacts were expected from adopting the IFRS 15, except for some specific sectors. Therefore, adopting the IFRS 15 and disclosing its impacts did not represent a significant challenge for companies. On the other hand, around 30% of the companies obtained an *IQNE* below 2.5, indicating that a non-negligible portion of the sample reported low-quality information concerning the adoption of IFRS 15.

Additionally, the results are consistent with those reported by Boujelben & Kobbi-Fakhfakh (2020), Moraes da Silva & Gonzales (2022), and Silva & Pierri Junior (2021). These studies addressing different samples and perspectives generally show a high adherence to the IFRS 15 disclosure requirements, which corroborates the empirical evidence presented here.

4.3 Analysis of the Impacts Caused by the IFRS 15

In addition to comparing the estimated effects with those that occurred after the IFRS 15 was adopted, this section discusses the numbers and the effects the companies reported as a result of the IFRS 15 to assess its actual effects in Brazil and which sectors were most affected.

4.3.1 Sector classification

The companies in the sample were categorized according to the sectoral classification defined by B3 and their respective subsectors (Table 6).

Table 6
Classification of the Impact of the IFRS 15/CPC 47 according to sector

	Not Reported	Uncertain	None	Some	Expected	Minor	Major	Total
Industrial goods	14	1	9	2	33	3	8	70
Communication	-	-	-	-	5	-	1	6
Consumer Cyclical Stocks	12	4	24	5	27	1	6	79
Non-Cyclical Stocks	4	-	2	-	16	-	5	27
Financial	32	1	16	1	33	-	4	87
Basic Material	6	-	1	-	23	-	2	32
Oil, Gas, and Biofuels	3	1	-	-	6	-	1	11
Healthcare	2	-	2	-	13	-	2	19
Information Technology	-	1	-	-	5	-	-	6
Public Utility	3	-	4	2	23	-	35	67
Others	10	-	6	-	9	-	-	25
Total	86	8	64	10	193	4	64	429

Source: developed by the authors.

Table 6 shows that the sectors most affected by the change in accounting practices were:

a. **Public Utility** – was the most severely impacted by the adoption of IFRS 15. Hence, 67% of the 67 companies analyzed suffered some impact after the standard was adopted, and 78% of these verified an impact more significant than expected;
b. **Communication** – 67% of the six companies in the communication sector verified some impact, and 17% of these verified an impact more significant than expected;
c. **Non-cyclical stocks**– 30% of companies suffered some impact, and 63% of these verified an impact more significant than expected;
d. **Industrial goods** - 26% of the companies verified some impact, and 44% of these verified an impact more significant than expected.

These results are in line with evidence obtained by Napier & Stadler (2020), Silva & Pierri Junior (2021), and Moraes da Silva & Gonzales (2022), who identified specific impacts in the sectors most affected by the adoption of IFRS 15, such as telecommunications.

4.3.2 Summary of the impacts

An analysis of the sample comprising 429 publicly-traded companies in the Brazilian market in 2018 regarding the impacts arising from the adoption of the new standard for recognizing contracts with customers revealed that the following impacts were the most recurrent.

4.3.2.1 Asset reclassification: Recognition of contract assets

In 2018, several companies in the electricity sector reclassified their concession assets to contractual assets. These assets consisted of infrastructure concession contracts and/or electricity transmission, which, in turn, are categorized as the company's right to consideration in exchange for goods or services transferred to customers when this right is conditioned to something other than the passage over time (e.g., the company's future performance).

As determined by CPC 47/IFRS 15, assets linked to a concession in progress recorded under the scope of ICPC 01 (R1)/IFRIC 12 – Concession Contracts must be classified as Contract Assets during the construction or transmission period and transferred to Intangible Assets only after the service or supply is completed.

According to IFRS 15, revenue is recognized when a customer obtains control of goods or services. Therefore, its recognition is conditioned to fulfilling previously identified performance obligations and no longer just by the passage of time.

Therefore, this amount, previously recognized as part of Intangible Assets, was reclassified in the balance sheet to Contract Assets, with no impact on the income statement.

Examples of companies that verified such impact: Ampla Energia e Serviços S.A.; Cia Energética Do Ceara – Coelce, CPFL Energia S.A., Cia Piratininga De Forca E Luz, Alupar Investimento S/A, Cemig Geração e Transmissão S.A., Cia Paranaense De Energia – Copel (Power Transmission Concession), Eletropaulo Metrop. Electronic São Paulo S.A., Equatorial Energia S.A., Cia Paulista de Forca e Luz, Rede Energia Participações S.A., Cia Saneamento Basico Est São Paulo, Empresa Conc Rodov Do Norte S.A., Econorte, Energisa S.A., Centrais Elet Bras S.A. - Eletrobras, EDP Espirito Santo Distribuição De Energia S.A., Light Serviços De Eletricidade S.A., and Neoenergia S.A.

In turn, other companies suffered from reclassifying the accounting balances representing the assets linked to concessions during the development or improvement period from the financial asset of the concession to a contractual asset. Again, under IFRS 15, the right to consideration for goods and services is conditioned on meeting another performance obligation. Thus, the concession asset in accounts receivable for infrastructure implementation and other remuneration, previously classified as a financial asset, is now classified as a contractual asset. Accordingly, such revenues are recognized under the contracts signed, whose performance obligation is met over time, and the compensation amount reflects the fair value receivable when the services are effectively transferred to customers.

Examples of companies that verified such an impact include Cachoeira Paulista Transmissora Energia S.A, Cia Estadual De Distrib Ener Elet-CEEE-D, Cia Estadual Ger.Trans.Ener.Elet-Ceee-Gt, Neoenergia S.A., Transmissora Aliança De Energia Elétrica S.A., Cteep - Cia Transmissão Energia Elétrica Paulista, Cia Energética De Minas Gerais - Cemig, Cemig Distribuição S.A, and Alupar Investimento S/A.

4.3.2.2 Failure to recognize revenue due to long history of default

According to IFRS 15, the companies must recognize revenues in the amount concerning the consideration they expect to be entitled to for the transfer of goods or services agreed upon within the contract. To assess the likelihood of collection, a company shall consider only the customer's ability and intention to pay the amount when due. In this sense, many companies failed to recognize revenues related to considerations they do not expect to receive, such as contracts with customers who have a long history of default and, for various reasons, had not yet suspended the service supply. The same happened for revenues referring to the portion of products expected to be returned.

Examples of companies with such impacts include Cia Energética do Rio Gde Norte - Cosern, Camil Alimentos S.A., Cia Eletricidade Est. da Bahia - Coelba, Elektro Redes S.A., Somos Educação S.A, Eletrobrás Participações S.A. - Eletropar, Technos S.A., and Battistella Adm Participacoes S.A.

4.3.2.3 Change in the timing of revenue recognition

A company should recognize revenue when performance obligations are met, i.e., when the product or service is transferred to a customer; such transfer occurs when the customer obtains control of that asset.

Under paragraph 35 of IFRS 15, a good or service should only be recognized if it meets any of the following characteristics:

a. the customer receives and consumes the benefits as the company simultaneously generates them;
b. the company's performance creates or improves an asset (e.g., work in progress) that the customer controls as the asset is created or improved;
c. the company's performance does not create an asset with an alternative use for it, or the company has an enforceable right to payment for performance completed to date.

In this sense, some companies identified that there should be a change when revenue is recognized and its recognition over time as the performance obligations are satisfied (recognition proportional to the stage of conclusion of the contracted transactions).

Examples of companies that verified this impact: Notre Dame Intermédica Participações SA, Cia Estadual Ger.Trans.Ener.Elet-Ceee-Gt, Wilson Sons Ltd., Conc Sist Anhang-Bandeirant S.A. Autoban; Ccr S.A; Conc Rod.Oeste Sp Viaoeste S.A., BK Brasil Operação e Assessoria a Restaurantes S.A., Fertilizantes Heringer S.A., and Azul S.A.

4.3.2.4 Separation in more than one performance obligation

Performance obligations are promises that goods or services will be transferred according to the agreed upon in a contract with a customer. The company must verify at the time of the contract the products or services promised to customers, and each promise must be identified as a performance obligation that is to be transferred to the customer (IFRS, 2014):

- A distinctive product or service; or
- A series of distinctive products or services that are substantially the same and are similarly transferred to the customer.

Each distinct good or service that a company promises to transfer to its customer will be a performance obligation, i.e., each will have a share of the total contract price allocated to it, and its respective revenues will be recognized separately as each is fulfilled.

Many companies did not expect the new standard to impact their financial statements. However, they were faced with the recognition of more than one performance obligation in operations that were previously recognized as a single obligation. Thus, even though not all companies verified effects on the recognition and measurement of revenues, there are some changes in the disclosure of information regarding the breakdown, balance, performance obligation, and transaction price allocated in revenues from customer contracts.

The following companies are examples of such case: Embraer S.A., Statkraft Energias Renováveis S.A., and Braskem S.A.

4.3.2.5 Variable considerations

According to IFRS 15, the companies must consider the contract terms and their usual business practices to determine the transaction price. Furthermore, the consideration established in a contract may include fixed amounts, variable amounts, or both. In most cases, the transaction price can be determined immediately; however, in transactions where there is a variable component, the companies must consider:

- Variable considerations;
- Restricted estimative of variable payments;
- The existence of a significant financing component in the contract;
- Non-monetary considerations;
- Considerations payable to the customer.

The compensation amounts in contracts may vary depending on whether there are discounts, rebates, refunds, credits, price concessions, incentives, performance bonuses, penalties, or other similar items, the revenue of which must be recognized in the net form. Additionally, dependence on future events that may or may not occur is a factor that influences variations in the transaction price. Such variations may be expressed in contractual terms, be a company's typical business practices, or even indicate that the company will accept an amount lower than that determined in the contract.

For this reason, companies such as CVC and Magazine Luiza S.A. started estimating variable considerations resulting from merchandise returns.

Examples of companies that verified such an impact were CVC Brasil Operadora e Agência de Viagens S.A., Braskem S.A., Energisa S.A., EDP Espirito Santo Distribuição de Energia S.A., and J. Macedo S.A.

(i) Sales revenue reducers

Recognizing discounts, rebates, and estimated merchandise returns as elements that decrease sales revenue, negatively impacting retained earnings/losses and reducing a company's net worth.

In other cases, selling expenses were reclassified as deductions from sales revenue, as some transactions not contemplated in the main contract for the supply of products, such as commercial actions concerning extra outlets and stores opening, among others, until then recognized as selling expenses, were now classified as revenue reducing items.

The companies that verified such an impact were M.Dias Branco S.A., Ind Com de Alimentos Ultrapar Participações S.A., Whirlpool S.A., Bombril S.A., Vulcabras/Azaleia S.A., Diagnósticos da América S.A., and Duratex S.A.

Utility companies are known to have a variable consideration that depends on penalties paid when they do not comply with adequate levels of electricity supply. The understanding in these cases was that the companies should recognize the net revenue of variable consideration. Thus, in the group of revenues related to the use of the distribution system, the entities reclassified penalties from the group of accounts "Operating Expenses" as "Operating Revenue" as these reduce this gross revenue.

The companies that verified such an impact were CPFL Energia S.A., Energisa Mato Grosso-Distribuidora De Energia S/A, Energisa Mato Grosso Do Sul - Dist De Energia S.A., Cia Energética de Brasília, EDP Espirito Santo Distribuição De Energia S.A., Cia Paranaense De Energia - Copel, Eletropaulo Metrop. Elet. Sao Paulo S.A., Equatorial Energia S.A., Cia Energética Do Rio Gde Norte - Cosern, Centrais Elet De Santa Catarina S.A., Cia Eletricidade Est. Da Bahia - Coelba, Elektro Redes S.A., Centrais Elet Bras S.A. - Eletrobras, Eneva S.A, Light Serviços De Eletricidade S.A., Neoenergia S.A., Cia Paulista De Forca E Luz, and Rede Energia Participações S.A.

(ii) Compensations payable to customers

IFRS 15 provides guidelines to treat compensations payable to customers. If a payment obligation concerns the transfer of goods or products, it should be deducted from the transaction price and, consequently, from the revenue. If it refers to a separate transaction, the company should record it as usual, as other purchases made with suppliers.

In this sense, some companies, which previously recognized compensations payable to customers as a selling expense, started recording these amounts as a reduction in the transaction price and, therefore, in sales revenue. For example, when selling tour packages, CVC only recognizes the revenue corresponding to the difference between the amount paid by the customer and the transfer made to third parties (tourist service providers).

Other companies that were affected were Cosan S.A. and Cosan Limited.

(iii) Expected loyalty and discount programs

Some companies have loyalty programs and grant discounts to customers to boost sales and promote customer loyalty. According to IFRS 15/CPC 47, costs incurred in this modality must be recognized as a reduction of sales revenue, considered a variable consideration.

The companies that verified this impact were Movida Participações S.A., Natura Cosméticos S.A., and Profarma Distrib Prod Farmacêuticos S.A.

4.3.3 Transition and Disclosure

In this paper, we sought to analyze the impacts caused by IFRS 15, considering how prepared the companies were to deal with these impacts, without, however, focusing on the monetary effects, as the standard sought to consolidate several previous standards determining how to recognize revenues in a single rule with uniform implementation. In this sense, the effects on many companies resulted from greater disclosure requirements and changes in how the information provided in financial reports is presented.

In other words, several companies, such as Braskem S.A. and Cosan S.A., did not report significant impacts after adopting the standard, only a need for providing greater detail in disclosures related to contracts with customers.

The companies that verified such an impact were Wilson Sons LTD., Cosan Limited, Linx S.A., Ferreira Gomes Energia S.A., Banco Inter S.A., Omega Geração S.A., Conc Rod.Oeste Sp Viaoeste S.A, Fleury S.A., and Ferreira Gomes Energia S.A.

Regarding the transition method, Table 7 presents the method the companies chose.

Table 7
Method chosen by the companies to adopt IFRS 15

Adoption method	No. of companies	Proportion
Comparative	24	6%
Alternative	109	25%
Uncertain	39	9%
None	257	60%

Source: developed by the authors.

Note that 60% of the companies did not report any impact caused by the standard and did not use a transition method. Only 6% of the companies adopted the full retrospective method, and 25% opted for the modified retrospective. Finally, it was impossible to identify the method used by 9% of the companies.

The results reported here are consistent with previous analyses. In other words, the fact that the IFRS 15 did not cause significant impacts for most of the companies in the sample explains the 60% of those not adopting any transition method.

4.3.4 Additional test: validating the *IQNE*

To test the *IQNE* rationale and assess whether it captures the quality of the explanatory notes, we verified whether companies with a high *IQNE* presented higher quality information in their financial statements based on the analysis of the companies awarded the Transparency Trophy (Anefac–Fipecafi–Serasa Experian Transparency Trophy). Therefore, we analyzed 18 of the 25 companies awarded in 2018 (the seven winning companies not analyzed did not have an *IQNE*).

The Transparency Trophy does not consider the results or the companies' economic and financial situation, which does not interfere with the selection process. The objective is to analyze the transparency and clarity of information companies provide to the market, which generates added value for the business. Thus, the Trophy does not evaluate the companies' management but rather the quality of their financial statements. Therefore, the conclusion is that the objectives of the Transparency Trophy are highly aligned with the objectives intended in this study; hence, a comparison between the descriptive statistics of this group of companies and the sample analyzed here was considered pertinent (Table 8).

Table 8
Comparative descriptive statistics of the *IQNE* of the companies in the sample and those awarded the 2018 Transparency Trophy

Variable	Mean	Standard-Deviation	Median	Sample (companies)
General IQNE	3.359	1.746	3.048	429
IQNE of the companies awarded the Transparency Trophy	4.194	1.016	5	18
t-test – Difference of Means				
t-statistic	3.2088	P-value (one-tailed)	0.002	
Degrees of freedom	21			

Source: developed by the authors.

Table 8 shows that the mean *IQNE* obtained by the companies awarded the Transparency Award in 2018 is higher than that obtained by the sample of the publicly traded companies analyzed here, with a lower standard deviation and median equal to 5. The t-test for differences of means confirms this finding. The P-value is 0.002; hence, the hypothesis that the means are equal is rejected (at a significance level of 10%, 5%, and 1%). Therefore, the *IQNE* rationale is validated, as companies with a high *IQNE* present higher quality information in their financial statements, considering that they met the criteria considered in the selection of companies for the Transparency Trophy. Thus, the *IQNE* measures the quality of accounting information.

5. Final considerations

Explanatory notes play a critical role in the process of disclosing accounting information (Healy & Papelu, 2001; Verrecchia, 2001; Salotti & Yamamoto, 2005; Murcia & Santos, 2009; Merkley, 2014; Moreno & Casasola, 2016) and, therefore, it is necessary to assess its quality of information. One of the main criticisms of explanatory notes is that they are becoming increasingly complex and sizeable and often present useless or irrelevant information (Cheung & Lau, 2016; Morunga & Bradbury, 2012; Richards & Staden, 2015, Lourenço, 2014, Flores, Santos, & Carvalho, 2015).

Given this context, this study's objective was to assess the quality of the explanatory notes in the transition to IFRS 15 - Revenue from Contracts with Customers, comparing the information that was disclosed before its adoption (2017) with the effects that were effectively reported after the first year in which the standard was implemented (2018).

In a sample comprising 429 publicly traded Brazilian companies, in 2017, more than half of the companies did not expect any impact from adopting IFRS 15, and the proportion of companies that did not verify impacts arising from adopting the standard in 2018 remained very similar. Most companies that verified some impact in 2018 just reclassified accounts for a better presentation or increased the information disclosed in explanatory notes. Additionally, the companies not disclosing the expected effects of IFRS 15 in 2017 continued not reporting any effects in 2018, possibly due to the irrelevance or immateriality of values.

Although, in general, the new standard did not produce material effects for most companies, it brought significant changes for some companies and sectors. Specifically, the public utility, communication, non-cyclical stocks, industrial goods, and civil construction sectors were the most affected by the reclassification of assets, liabilities, revenues, and expenses; changes in the timing of revenue recognition and the number of performance obligations in each transaction, and identification of variable considerations.

Regarding the Explanatory Note Quality Index (*IQNE*), on average, companies presented good quality information disclosed in the explanatory notes for the transition to IFRS 15; the mean index was 3.359, and 45% of the companies obtained the highest index (5).

This study is relevant to discuss how companies deal with the adoption of a new accounting standard, mainly regarding its preparation and the analysis of the effects that effectively occurred due to such a change. Because it is a standard that covers the revenue recognition process of all segments, adopting IFRS 15 potentially impacted many companies, to a greater or lesser extent, as it involves changes in the most critical component of the revenue arising from their respective operating activities.

In this sense, the information provided by the companies about the implementation of IFRS 15 needed to be the most accurate. Therefore, this study is relevant to the academic literature as it analyzes the quality of accounting information disclosed to understand the companies' commitment toward third parties necessary for their existence and continuity.

In addition to contributing to academia and users of accounting information in general, this study's results are expected to be beneficial for regulatory bodies, such as the Iasb, as it provides important evidence on the adoption of IFRS 15, which can be relevant during the Post-Implementation Review (PIR) process.

This study's limitations include the fact that comparisons considered information disclosed by the companies in 2017 and 2018, in addition to the classifications and categorizations performed when developing the *IQNE*, which partially depended on the authors' judgment. Nonetheless, such limitations do not invalidate the results, and this paper contributes to the discussion on the Quality of Explanatory Notes based on an important standard that potentially impacts many segments and companies.

References

Antunes, M. T. P., Grecco, M. C. P., Formigoni, H., & Mendonça, O. (2012). A adoção no Brasil das normas internacionais de contabilidade IFRS: o processo e seus impactos na qualidade da informação contábil. *Revista de Economia e Relações Internacionais*, *10*(20), 5-19.

Baldissera, J. F., Gomes, A. R. V., Zanchet, A., & Fiirst, C. (2019). Gerenciamento de resultados em companhias do setor de construção civil: Influência da adoção do CPC 17. *Revista Universo Contábil*, 14(2), 100-117, http://dx.doi.org/10.4270/ruc.2018213.

Braga, E.C., Nascimento, J. F., & Santos, M.I.C. (2022). Value Relevance: análise dos efeitos da adoção da IFRS 15 – Receitas de Contrato com Clientes. *Revista Gestão e Conhecimento,* 16(1), 90-114, https://doi.org/10.55908/RGCV16N1-007.

Brasil. (2020). *Lei 6.404, de 15 de dezembro de 1976*. Dispõe sobre as sociedades por ações. Disponível em: <http://www.planalto.gov.br/ccivil_03/leis/l6404consol.htm>. Acesso em 17 mai. 2020.

Boubaker, S., Gounopoulos, D., & Rjiba, H. (2019). Annual report readability and stock liquidity. *Financial Markets, Institutions & Instruments*, *28*(2), 159-186. https://doi.org/10.1111/fmii.12110.

Boujelben, S., & Kobbi-Fakhfakh, S. (2020). Compliance with IFRS 15 mandatory disclosures: an exploratory study in telecom and construction sectors. *Journal of Financial Reporting and Accounting*, *18*(4), 707–728, https://doi.org/10.1108/JFRA-10-2019-0137.

Cheung, E., & Lau, J. (2016). Readability of notes to the financial statements and the adoption of IFRS. *Australian Accounting Review*, *26*(2), 162-176, https://doi.org/10.1111/auar.12087.

Comitê de Pronunciamentos Contábeis (CPC). (2020). *CPC 00 (R2) – Estrutura Conceitual para Relatório Financeiro*. Disponível em: <http://static.cpc.aatb.com.br/Documentos/573_CPC00(R2).pdf>. Acesso em: 16 de dez. 2020.

Comitê de Pronunciamentos Contábeis (CPC). (2020). *CPC 23 – Políticas Contábeis, Mudança de Estimativa e Retificação de Erro*. Disponível em: <http://static.cpc.aatb.com6.br/Documentos/296_CPC_23_rev%2014.pdf>. Acesso em: 16 de mai. 2020.

Comitê de Pronunciamentos Contábeis (CPC). (2020). *CPC 26 (R1) – Apresentação das Demonstrações Contábeis*. Disponível em: <http://static.cpc.aatb.com.br/Documentos/312_CPC_26_R1_rev%20 14.pdf>. Acesso em: 11 de dez. 2020.

Comitê de Pronunciamentos Contábeis (CPC). (2020). *CPC 47 – Receita de Contratos com Clientes.* Disponível em: <http://static.cpc.aatb.com.br/Documentos/527_CPC_47_Rev%2014.pdf>. Acesso em: 16 de mai. 2020.

Comitê de Pronunciamentos Contábeis (CPC). (2020). *OCPC 07 – Evidenciação na Divulgação dos Relatórios Contábil-Financeiros de Propósito Geral*. Disponível em: <http://www.cpc.org.br/Arquivos/Documentos/488_OCPC_07_Orienta%C3%A7%C3%A3o.pdf >. Acesso em: 16 de mai. 2020.

Dani, A. C., dos Santos, C. A., Panucci Filho, L., & Klann, R. C. (2017). Efeito da adoção antecipada da IFRS 15 na Qualidade da Informação Contábil. *Enfoque: Reflexão Contábil*, 36(2), 131-146.

Diniz, J.A., Martins, E., Miranda, G. J. (2018). *Análise didática das demonstrações contábeis.* 2ª edição – São Paulo: Atlas.

EY. (2014). *Aplicando as normas IFRS. IFRS 15 - Receita de Contratos com Clientes. Uma análise detalhada da nova norma para reconhecimento de receitas.* São Paulo, 2014. Disponível em: <http://www.ey.com.br>. Acesso em: 16 mai. 2020.

Flores, E., Santos, A., Carvalho, L. (2015). Notas explicativas no atual sistema contábil: importância, alcance e características. *Controvérsias Jurídico-Contábeis (Aproximações e Distanciamentos).*

Gabriel, F. (2011). *Impacto da adesão às práticas recomendadas de governança corporativa no índice de qualidade da informação contábil* (Doctoral dissertation, Universidade de São Paulo).

Gelbcke, E. R., Santos, A., Iudícibus, S., Martins, E. (2018). *Manual de Contabilidade Societária: Aplicável a todos as Sociedades de acordo com as Normas Internacional e do CPC.* 3ª edição. São Paulo: Atlas.

Glaum, M., Baetge, J., Grothe, A., & Oberdörster, T. (2013). Introduction of international accounting standards, disclosure quality, and accuracy of analysts' earnings forecasts. *European Accounting Review*, *22*(1), 79-116, https://doi.org/10.1080/09638180.2011.558301.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1-3), 405-440, https://doi.org/10.1016/S0165-4101(01)00018-0.

Hendriksen, E. S., & Breda, M. E. (1999). *Teoria da Contabilidade*. 5.ed. São Paulo: Atlas.

International Accounting Standards Board (Iasb). (2014). *International Financial Reporting Standard 15: Revenue from Contracts with Customers*. Disponível em: <http://www.ifrs.org>. Acesso em: 15 mai. 2020.

International Accounting Standards Board (Iasb). (2003). *IAS 8: Accounting Policies, Changes in Accounting Estimates and Errors*. Disponível em: <http://www.ifrs.org>. Acesso em: 15 mai. 2020.

Iudícibus, S. (2015). *Teoria da Contabilidade*. 11. ed. São Paulo: Atlas.

Lopes, A. B, & Martins, E. (2005). *Teoria da Contabilidade: uma nova abordagem.* São Paulo: Atlas.

Lourenço, I. C. (2014). Notas Explicativas: Uma visão internacional. *Revista FIPECAFI*, 1(1), 10-15.

Marconi, M. A., & Lakatos, E. M. (2003). *Fundamentos de metodologia científica*. 5ª edição. São Paulo: Atlas.

Martins, E. A. (2014). Menor Volume e Maior Relevância para as Notas Explicativas. *Revista FIPECAFI*, 2, 50-59.

Merkley, K. J. (2014). Narrative disclosure and earnings performance: evidence from R&D disclosures. *The Accounting Review, 89*(2), 725-757, https://doi.org/10.2308/accr-50649.

Moraes da Silva, T., & Gonzales, A. (2022). CPC 47: Novos Direcionamento ou uma Nova Interpretação? *Revista Eletrônica Do Departamento de Ciências Contábeis & Departamento de Atuária e Métodos Quantitativos (REDECA)*, *9*, 2–24, https://doi.org/10.23925/2446-9513.2022v9id58504.

Morawska, I. (2021). The impact of the IFRS 15 implementation on the revenue based earnings management in Poland. *Journal of Economics & Management*, 43, 387-403.

Moreno, A., & Casasola, A. (2016). A readability evolution of narratives in annual reports: A longitudinal study of two Spanish companies. *Journal of Business and Technical Communication*, *30*(2), 202-235, https://doi.org/10.1177/1050651915620233.

Morunga, M., & Bradbury, M. E. (2012). The impact of IFRS on annual report length. *Australasian Accounting, Business and Finance Journal*, *6*(5), 47-62, http://dx.doi.org/10.14453/aabfj.v6i5.4.

Murcia, F. D. R., & Santos, A. (2009). Fatores determinantes do nível de disclosure voluntário das companhias abertas no Brasil. *Revista de Educação e Pesquisa em Contabilidade (REPeC)*, *3*(2), 72-95, https://doi.org/10.17524/repec.v3i2.68.

Napier, C. J., & Stadler, C. (2020). The real effects of a new accounting standard: the case of IFRS 15 Revenue from Contracts with Customers. *Accounting and Business Research*, *50*(5), 474–503, https://doi.org/10.1080/00014788.2020.1770933.

Nascimento, A. M.; Reginato, L. (2008). Divulgação da informação contábil, governança corporativa e controle organizacional: uma relação necessária. *Revista Universo Contábil*, 4 (3), http://dx.doi.org/10.4270/ruc.20084.

Onie, S., Ma, L., Spiropoulos, H., & Wells, P. (2022). An evaluation of the impacts of the adoption of IFRS 15 *Revenue from Contracts with Customers*. *Accounting & Finance*. 00, 1-21, https://doi.org/10.1111/acfi.12978.

Kreston Partnership. (2016). *Receitas de contratos com clientes e as mudanças no reconhecimento de receita.* Disponível em: <https://krestonpartnership.com.br/english/receitas-de-contratos-com-clientes-e-as-mudancas-no-reconhecimento-de-receita/>. Acesso em: 17 mai. 2020.

Pinto, A. E., Silva, F. P., Murcia, F. D., & Vettori, G. G. (2020). *Controvérsia jurídico-contábeis.* São Paulo: Atlas.

Piosik, A. (2021). Revenue recognition in achieving consensus on analysts' forecasts for revenue, operating income and net earnings: The role of implementing IFRS 15. *Evidence from Poland. Procedia Computer Science*, 192, 1560-1572, https://doi.org/10.1016/j.procs.2021.08.160.

Richards, G., & Van Staden, C. (2015). The readability impact of international financial reporting standards. *Pacific Accounting Review*. 27 (3), 282-303, https://doi.org/10.1108/PAR-08-2013-0086.

Salotti, B. M., & Yamamoto, M. M. (2005). Ensaio sobre a teoria da divulgação. *Brazilian Business Review (BBR)*, *2*(1), 53-70.

Shroff, N., Sun, A. X., White, H. D., & Zhang, W. (2013). Voluntary disclosure and information asymmetry: Evidence from the 2005 securities offering reform. *Journal of Accounting Research*, *51*(5), 1299-1345, https://doi.org/10.1111/1475-679X.12022.

Silva, D. I. da, & Pierri Junior, M. A. (2021). Adoção do CPC 47 (IFRS 15) nas Empresas do Setor de Telecomunicações Listadas na B3. *Revista Contabilidade e Controladoria*, *12*(2), https://doi.org/10.5380/rcc.v12i2.75691.

Silva, L. F. S., Prado, T. A. dos R., & Araujo, J. A. O. (2021). IFRS 15 e CPC 47: Impactos Evidenciados pelas Companhias Brasileiras Relativos à Adoção da Norma. *Liceu On-Line*, *11*(1), 148–165.

Souza, P. V. S. D., Gonçalves, R. D. S., & Silva, C. A. T. (2022). Impact of IFRS 15 on the Quality of Accruals and Earnings Management of Brazilian Publicly Held Companies. *Revista Brasileira de Gestão de Negócios*, 24, 675-691, https://doi.org/10.7819/rbgn.v24i4.4197.

Verrecchia, R. E. (2001). Essays on disclosure. *Journal of Accounting and Economics*, *32*(1-3), 97-180, https://doi.org/10.1016/S0165-4101(01)00025-8.

Zhou, H. (2007). Auditing standards, increased accounting disclosure, and information asymmetry: Evidence from an emerging market. *Journal of Accounting and public policy*, *26*(5), 584-620, https://doi.org/10.1016/j.jaccpubpol.2007.08.004.

repec
Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting
ABRACICON Academia Brasileira de Ciências Contábeis

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 17, n. 2, Guidelines for Author, p. 242-244, Apr./Jun. 2023 | ISSN 1981-8610

Guidelines for Authors

1. Paper Submission Guidelines

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.

Articles submitted to the journal must be original, i.e., cannot have been published or submitted to another journal.

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.

The submission of articles should be done electronically, through the www.repec.org.br website. At the end of the submission an electronic message will be sent by e-mail, confirming receipt of the article.

2. Content and Formatting of Papers

At the moment of submission, the articles should contain:

- The **title** in the language of origin of the article (Portuguese or English) without identifying the author(s);
- 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.
- The pages of the articles should be properly numbered in the upper right corner, typed with Word for Windows, under the following conditions:
  - A4 paper (210 x 297 mm);
  - Times New Roman, size 12;
  - Spacing: single;
  - Paragraph input: 1.25;
  - Margins: 3cm top, 2cm bottom, 3cm left, 2cm right;
  - Tables and figures in Times New Roman, size 10;
  - Citations and references must comply with current standards of the APA (American Psychological Association).

3. Tables and Figures[1]

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

3.1 Tables

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

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

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

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

3.2 Figures

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:

Font	Times New Roman, size 10
Figure colors	Use only black and white (grayscale)
Format	Figures should be submitted in an editable format
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
Size and proportion	Figures must fit the dimensions of the journal. Therefore, a figure should be drawn or inserted into the article so that it can be reproduced in the width of a column or page of the journal to which it will be submitted
Citations in the main text	When citing a figure in the text type only the number referring to the figure, e.g. Figure 1, Figure 2, Figure 3 and so on. (the word 'Figure' should be presented with the first letter capitalized). Never write 'figure below' figure above ', or even 'figure on page XX' because the page numbers of the article can be changed during formatting

4. Citations and References

For the full version of the standards of citations and references according to APA (American Psychological Association), access http://www.repec.org.br/index.php/repec/article/view/1607/1237.