

## Auditors' Opinions and Tax Aggressiveness in Brazilian Companies

### Opiniões dos Auditores e Agressividade Fiscal nas Empresas Brasileiras

Antonio Lopo Martinez<sup>\*1</sup> – [almartinez@fd.uc.pt](mailto:almartinez@fd.uc.pt) ORCID: <https://orcid.org/0000-0001-9624-7646>

Fernando Ferreira dos Santos<sup>\*2</sup> – [f.f\\_santos@hotmail.com](mailto:f.f_santos@hotmail.com) ORCID: <https://orcid.org/0000-0003-0875-5021>

César Valentim de Oliveira Carvalho Júnior<sup>\*3</sup> – [ctkawamoto@gmail.br](mailto:ctkawamoto@gmail.br) ORCID: <https://orcid.org/0000-0002-1513-4293>

Sergio Augusto Pereira Bastos<sup>\*2</sup> – [sbastos@fucape.br](mailto:sbastos@fucape.br) ORCID: <http://orcid.org/0000-0002-5697-3624>

Josiel Caldas Rodrigues<sup>\*2</sup> – [j.kurttt@yahoo.com.br](mailto:j.kurttt@yahoo.com.br) ORCID: <https://orcid.org/0009-0007-8430-6339>

1 – UCILeR – University of Coimbra Institute for Legal Research

2 - FUCAPE – Fucape Business School

3 - UFBA – Universidade Federal da Bahia

#### Abstract

This study delves into the intricate relationship between independent auditor opinions and corporate tax aggressiveness. We investigate whether the characteristics of auditor opinions, such as the presence of caveats, length, readability, and verbal tone, signal a company's tendency to engage in aggressive tax practices. Utilizing a quantitative approach, we employed a multiple linear regression model on a dataset of 1,271 observations from companies listed on the B3 stock exchange between 2017 and 2022. Tax aggressiveness was measured using established proxies like book-tax differences (BTD), effective tax rate (ETR), and tax rate on value added (TTVA). Our findings reveal a lack of significant correlation between the informational content of auditor opinions and corporate tax aggressiveness. Contrary to expectations, characteristics such as caveats, length, readability, and verbal tone did not significantly signal corporate tax strategies. This suggests that while auditor opinions are vital for financial reporting and corporate governance, their ability to indicate tax practices might be limited or indirect. These insights add to the discourse on corporate governance and tax compliance, promoting transparent and equitable business practices. Further research is needed to identify other factors that may influence tax aggressiveness and to better understand the dynamics between auditors and corporate tax strategies.

**Keywords:** Tax Aggressiveness. Auditors' Opinions. Audit Reports. Brazilian Companies. B3.

#### Resumo

Este estudo investiga a intrincada relação entre os pareceres de auditores independentes e a agressividade fiscal das empresas. Investigamos se as características dos pareceres dos auditores, como a presença de ressalvas, a extensão, a legibilidade e o tom verbal, sinalizam a tendência de uma empresa de se envolver em práticas tributárias agressivas. Utilizando uma abordagem quantitativa, empregamos um modelo de regressão linear múltipla em um conjunto de dados de 1.271 observações de empresas listadas na bolsa de valores B3 entre 2017 e 2022. A agressividade fiscal foi medida com o uso de indicadores estabelecidos, como diferenças entre livros e impostos (BTD), taxa efetiva de impostos (ETR) e taxa de impostos sobre o valor agregado (TTVA). Nossos resultados revelam uma falta de correlação significativa entre o conteúdo informativo dos pareceres dos auditores e a agressividade fiscal das empresas. Ao contrário do que se esperava, características como ressalvas, extensão, legibilidade e tom verbal não sinalizaram significativamente as estratégias tributárias das empresas. Isso sugere que, embora os pareceres dos auditores sejam vitais para os relatórios financeiros e a governança corporativa, sua capacidade de indicar práticas tributárias pode ser limitada ou indireta. Esses insights contribuem para o discurso sobre governança corporativa e conformidade fiscal, promovendo práticas comerciais transparentes e equitativas. São necessárias mais pesquisas para identificar outros fatores que possam influenciar a agressividade fiscal e para entender melhor a dinâmica entre os auditores e as estratégias fiscais das empresas.

**Palavras-chave:** Agressividade Fiscal. Opiniões dos Auditores. Relatórios de Auditoria. Empresas Brasileiras. B3.

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## **1 Introduction**

Tax aggressiveness has emerged as a topic of notable interest both nationally and internationally (Chantziaras et al., 2021). As highlighted by Kovermann and Velte (2019), there is a growing political and academic interest in understanding these practices. Following the 2007 global financial crisis, governments worldwide initiated various strategies to combat aggressive tax management practices (Athira & Ramesh, 2023). Despite being widely explored in the international context, tax aggressiveness remains an active area of research, especially in emerging markets (Hartmann & Martinez, 2020).

In general terms, tax aggressiveness can be understood as actions taken by companies with the aim of reducing their tax burden (García et al., 2021). These actions are considered a management practice, resulting in increased cash flow and, consequently, in the distribution of dividends to shareholders (Almeida et al., 2021). Companies that are more tax aggressive are those that, through various strategies, pay less in taxes (Hartmann & Martinez, 2020). Factors such as market pressure, shareholder incentives, and external audits influence the adoption of these practices (Lopo Martinez et al., 2023).

In the corporate context, decisions related to tax aggressiveness have become highly relevant, especially for multinational companies, where a board member is typically responsible for this issue (Wen et al., 2020). Studies demonstrate that family businesses tend to be less tax aggressive compared to non-family businesses (Chen et al., 2010). According to Kovermann & Velte (2019), as a company distances itself from its tax obligations, it becomes more tax aggressive. Tax complexity is a determining factor in the attractiveness of tax evasion for companies, as undetected evasion results in a significant reduction of the tax burden (Santos, Carvalho & Ávila, 2019; Degl'Innocenti, Levaggi & Menoncin, 2022).

In this scenario, taxation and independent auditing play key roles in the structure and governance of companies (Almeida et al., 2021). Independent auditors have the primary function of assessing companies' tax compliance, issuing opinions that influence market confidence in financial statements (Hartmann & Martinez, 2020). Factors such as the quality of financial statements, company size, and report readability significantly impact the fees charged and the opinions issued by auditing firms (Blanco et al., 2021).

Therefore, the central problem of this research lies in the finding that tax aggressiveness, as a business strategy, seeks to mitigate the tax burden (García-Meca et al., 2021). However, the fine line separating legitimate tax planning from tax evasion (Hartmann & Martinez, 2020) highlights the importance of the supervision and judgment of independent auditors.

Academic literature has addressed aspects such as audit quality and tax aggressiveness (Goldman et al., 2022; Almeida et al., 2021), external audits and tax aggressiveness (Hartmann & Martinez, 2020; Suyono, 2018), and the influence of financial statements and their readability on the opinions of independent auditors (Blanco et al., 2021). However, it has not yet comprehensively explored how the opinions of independent auditors can directly signal companies' tax aggressiveness practices.

In light of this context, this research seeks to answer the following question: How do audit opinions signal tax aggressiveness? To address this question, the present study aims to investigate whether characteristics of independent auditors' opinions can indicate the aggressive taxation practices adopted by companies. By exploring this interrelationship, it is hoped to fill an existing gap in the literature and provide relevant contributions for professionals in the field, legislators, and other stakeholders. Understanding the relationship between audit opinions and tax aggressiveness can assist in detecting the tax risks assumed by companies and in formulating policies that promote greater tax compliance.

## **2 Theoretical Framework**

### 2.1 Audit Quality and Tax Aggressiveness

Research on tax aggressiveness frequently centers on identifying its determinants within companies, as noted by Hartmann and Martinez (2020). These determinants encompass firm-specific characteristics, environmental attributes, restrictions imposed by gatekeepers (such as auditors and consultants), and corporate incentives.

Several factors are explored to examine the effects of tax aggressiveness. For instance, financial leverage and company size have been identified as influential aspects (Suyono, 2018). The corporate governance model also plays a significant role; blockholders tend to be less tax aggressive compared to other types of shareholders (Kovermann & Velte, 2019). Furthermore, the complexity of the tax system is a critical factor that substantially impacts tax aggressiveness (Santos et al., 2019).

While previous studies have extensively examined the role of auditor quality—often proxied by the Big Four status—in influencing tax aggressiveness, there is a growing interest in understanding whether specific characteristics of the auditor's report itself can signal a company's tax aggressiveness. This shift in focus acknowledges that the content and presentation of the auditor's opinion may contain valuable insights about a company's financial practices, including its approach to taxation.

Delving into the relationship between audit quality and tax aggressiveness, Almeida et al. (2021) conducted a study using a sample of 299 companies with data available in 2019. They differentiated between companies audited by Big Four firms and those audited by other entities. Tax avoidance practices were quantified using the Effective Tax Rate (ETR) and an adjusted ETR based on data from the Statement of Value Added (DVA), referred to as ETR\_DVA. The meticulous selection of the sample and the specific metrics employed underscore the methodological rigor of their study, offering nuanced insights into this complex phenomenon within a particular context.

Their research hypothesis—that companies with higher audit quality exhibit lower tax aggressiveness—was confirmed when measured using the ETR metric. However, when the analysis incorporated the ETR\_DVA metric, the results did not support the initial hypothesis, showing no statistical significance. Notably, all control variables, such as return on assets, leverage, and company size (indicated by SIZE), remained statistically significant.

Similarly, Suyono (2018) investigated auditor quality and tax aggressiveness using a sample of 76 industrial companies listed on the Indonesian Stock Exchange from 2012 to 2016. The study employed the ETR as a measure of tax aggressiveness and utilized a dummy variable to distinguish between companies audited by Big Four firms and those that were not. The findings concluded that companies audited by Big Four firms exhibited lower levels of aggressive tax practices compared to those audited by non-Big Four firms.

Complementing these studies, Hartmann and Martinez (2020) explored not only the influence of external audits on tax aggressiveness but also the impact of audit firm rotation—an aspect often underestimated in prior research. Specifically, they examined how tax aggressiveness is affected when a company switches from Big Four to non-Big Four audit firms and vice versa. Analyzing a robust sample of 340 Brazilian non-financial companies listed on B3 between 2010 and 2016, they employed two key metrics to assess tax aggressiveness: the Book-Tax Difference (BTD) and the ETR.

Their results revealed that companies not audited by Big Four firms were more tax aggressive than those audited by Big Four firms. However, the research did not provide consistent evidence to determine whether companies become more or less aggressive when switching between Big Four and non-Big Four auditors. It is crucial to highlight that both Suyono (2018) and Hartmann and Martinez (2020) found that companies audited by Big Four firms tend to be less tax aggressive.

These studies collectively suggest that while auditor quality plays a role in tax aggressiveness, there is limited understanding of how the content and characteristics of the auditor's report might reflect or signal tax

aggressiveness. Investigating these characteristics extends the understanding beyond auditor quality to the communicative aspects of audit reports, which may hold key information for stakeholders assessing corporate tax practices.

Furthering the discourse, Goldman et al. (2022) conducted a study focused on income tax audits to examine how independent auditors develop the specialized knowledge required to audit income taxes and whether this expertise influences audit quality. They identified three conditions necessary for auditors to develop this knowledge at the office level: (1) recognizing common elements among tasks, (2) fully understanding and mastering the subject matter, and (3) possessing organized prior knowledge that facilitates task application. Goldman et al. (2022) utilized two methods to analyze the development of income tax audit knowledge at the office level: archival analysis of audits and interviews with practitioners. They measured audit quality using the restatement of financial reports due to incorrect tax returns as a proxy.

Collectively, the studies by Almeida et al. (2021), Suyono (2018), Hartmann and Martínez (2020), and Goldman et al. (2022) offer a comprehensive perspective on the complex interplay between audit quality, audit firm rotation, and tax aggressiveness. These investigations provide a foundational understanding for the proxies employed in this research to measure tax aggressiveness, guiding the methodological approach and enriching the analysis of this multifaceted issue. However, there remains a gap in the literature regarding whether and how the characteristics of the auditor's report itself act as signals of tax aggressiveness. Investigating these characteristics extends the understanding beyond auditor quality to the communicative aspects of audit reports, which may hold key information for stakeholders assessing corporate tax practices.

## 2.2 Information Content Analysis of Auditor's Reports

Building upon the conceptual foundations of tax aggressiveness and its influencing elements, this study focuses specifically on the characteristics of the auditor's opinion as potential signals of tax aggressiveness. Pakdaman (2018) conducted a study of 125 companies listed on the Tehran Stock Exchange (TSE) between 2011 and 2013. The objective was to examine whether reservations in independent auditors' opinions impact stock returns. The study concluded that such reservations have a significant effect on stock returns.

Similarly, Guimarães et al. (2022) conducted a study on Brazilian companies using a more extensive sample. Analyzing 1,368 observations from 2011 to 2019, the authors investigated the impact of caveats issued in independent auditors' opinions, differentiating between audit firms classified as Big Four and non-Big Four, as well as opinions issued during periods of crisis. The findings suggest that companies with reservations in their independent auditors' opinions are penalized by external users of their information.

Given that caveats and reservations in auditor's opinions may reflect underlying issues in financial reporting, including aggressive tax practices, the first hypothesis is proposed:

(H1): The number of caveats in the auditor's opinion is positively related to tax aggressiveness.

In another study, Moreira et al. (2016) analyzed the information content and type of news disclosed during conference calls, using a sample of 3,559 quarterly observations from companies listed on BM&FBovespa between 2008 and 2015. The study aimed to determine whether the type of news and the persistence of results influence the amount of voluntary information disclosed by companies during conference calls. The authors observed that companies disclosing bad news provided more information during conference calls than those with good news.

Applying this insight to auditor's opinions, it can be posited that longer auditor's reports may be associated with companies engaging in more complex or aggressive financial practices, potentially including tax aggressiveness. Therefore, the second hypothesis is proposed:

(H2): The length of the auditor's opinion, measured by the number of characters, is positively related to tax aggressiveness.

To examine whether the tone of regulatory language influences share prices, Chantziaras et al. (2021) analyzed a sample of 329 companies between 2006 and 2014. Utilizing textual analysis methods, they created a specific dictionary to assess the verbal tone of regulatory documents. The authors concluded that documents issued with a negative verbal tone, compared to a positive one, have a significant impact on share prices.

Complementing these findings, Ferreira et al. (2019) extended investigations into corporate communication practices by focusing on the verbal tone used by managers during conference calls and its relationship with companies' current and future performance. Employing computerized content analysis of conference call transcripts, they utilized a dictionary of positive and negative words to measure managers' verbal tone. The sample included conference calls from Brazilian companies with American Depositary Receipts (ADRs) in the U.S. market, covering the period from 2002 to 2016.

Ferreira et al. (2019) found a positive relationship between the verbal tone used by managers and companies' current and future performance. This suggests that managers employ a more optimistic tone when the company reports good results in the current quarter, whereas a negative tone indicates poorer results in the subsequent quarter.

Building on these studies, the tone of the auditor's opinion may reveal implicit signals about a company's financial health and practices, including tax aggressiveness. A more negative tone could indicate concerns or issues identified by the auditor, potentially related to aggressive tax strategies. Therefore, the third hypothesis is proposed:

(H3): The verbal tone used in the auditor's opinion is inversely related to tax aggressiveness.

Souza and Borba (2022) analyzed a sample of 600 companies from 2006 to 2019 to validate two hypotheses: (1) reports of companies with more persistent results and better performance are more readable; (2) companies that fail to surpass the performance of the previous period are expected to produce less readable reports. The study's results validated both hypotheses, confirming that companies with more persistent results and better performance produce more readable reports, suggesting that managers of such companies tend to present less complex reports. Conversely, companies failing to surpass their previous period's performance tend to issue more complex reports.

In a related study, Blanco et al. (2021) examined whether the readability of companies' financial reports influences auditors' work effort. Using a sample of 11,189 observations from the Compustat North America Industrial Annual database between 2004 and 2015, the authors measured auditors' work effort via the delay in delivering audit opinions and the fees charged. To assess the readability of financial reports, they utilized the BOG index, which measures attributes outlined in the Plain English Handbook. The findings indicated that when the readability coefficient is positive, auditors are more likely to issue unqualified opinions.

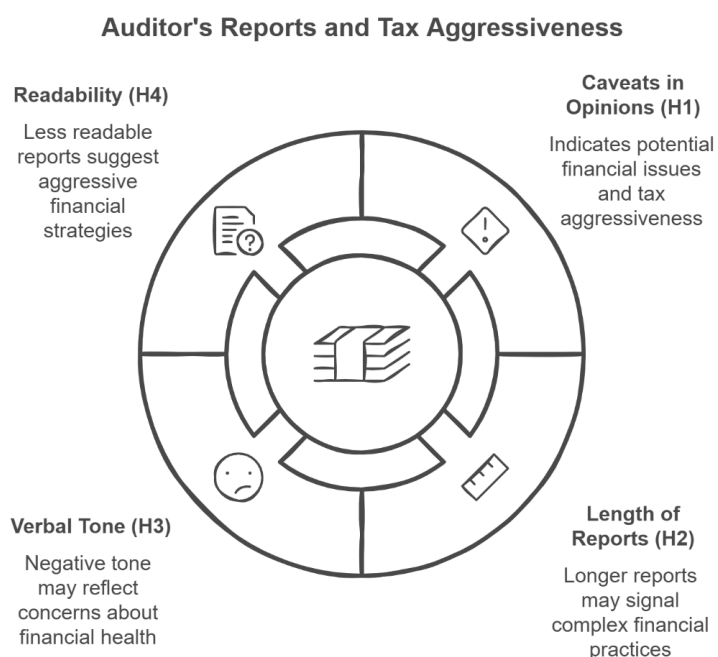
Extending this perspective to the auditor's opinion itself, the readability of the audit report may act as a signal of tax aggressiveness. A less readable report could indicate complex financial practices, including aggressive tax strategies, whereas a more readable report may reflect transparency and straightforward financial reporting. Drawing on the insights of Souza and Borba (2022) and Blanco et al. (2021), the fourth hypothesis is proposed:

(H4): The readability of the auditor's opinion is inversely proportional to tax aggressiveness.

In this section, we have synthesized existing literature to establish four hypotheses connecting various aspects of auditors' reports—such as caveats, length, verbal tone, and readability—with tax aggressiveness. By focusing on these specific attributes of the auditor's opinion, this study aims to determine whether the characteristics of the audit report signal tax aggressiveness, thereby contributing to a more nuanced understanding of the auditor's communicative role in conveying information about corporate tax behavior. These

hypotheses will guide the subsequent empirical analysis, aiming to deepen the understanding of how the informational content and presentation of auditors' opinions relate to corporate tax practices.

Figure 1  
*Hypotheses for Increased Tax Aggressiveness*



### 3 Methodology

The primary aim of this study is to examine the influence of independent auditors' opinions on companies' tax aggressiveness. To achieve this objective, the empirical analysis employs a multiple linear regression model. This quantitative method is chosen as it allows for examining the dependency relationship between the dependent variable—tax aggressiveness—and the selected independent variables derived from auditors' opinions.

Tax aggressiveness is measured using established metrics such as Book-Tax Differences (BTD), Effective Tax Rate (ETR), and Total Tax Value Added (TTVA) (Hartmann & Martínez, 2020; Chiachio & Martínez, 2019). The regression model incorporates three control variables: Return on Assets (ROA), Leverage (LEV), and company size (SIZE), following the methodologies of prior studies that have demonstrated their relevance (Hartmann & Martínez, 2020; Almeida et al., 2021). Additionally, independent variables related to auditors' opinions are included to capture the specific characteristics of the auditors' reports that may signal tax aggressiveness.

Given that this is a panel data regression model, industry sector fixed effects are included to control for sector-specific influences on tax practices (Almeida et al., 2021). The model's assumptions—such as the normality of residuals, absence of multicollinearity, and independence of residuals—are verified to ensure the model appropriately fits the data and adheres to standards in the literature.

### 3.1 Description of The Sample

The study utilizes panel data from publicly listed companies on the B3 stock exchange from 2017 to 2022. Financial data were collected to calculate the tax aggressiveness proxies (ETR, BTM, and TTVA) and the control variables (ROA, LEV, and SIZE). Auditors' opinions were obtained to extract variables related to the characteristics of the audit reports.

To calculate the ETR and BTM proxies, data from income statements and tax calculation notes were used. According to Lopo Martinez et al. (2023), ETR is calculated as the sum of income tax and social contribution divided by profit before income tax (LAIR). BTM is computed as the difference between accounting profit and taxable profit (Hartmann & Martinez, 2020). For TTVA, data from the Statement of Value Added (DVA) were utilized, with TTVA calculated by dividing the total tax burden by the value added (Chiachio & Martinez, 2019).

The control variables ROA, LEV, and SIZE were calculated using information from balance sheets and income statements. ROA is calculated by dividing operating income by total assets of the previous year (Lopo Martinez et al., 2023). LEV is measured by dividing long-term debt by total assets, and SIZE is determined by taking the natural logarithm of total assets.

### 3.2 Data Collection

Companies listed on the B3 stock exchange from 2017 to 2022 were selected using the Economática database for financial data and the Brazilian Securities and Exchange Commission (CVM) database to obtain independent auditors' opinions. The integration of financial data with auditors' reports allows for a comprehensive analysis of the relationship between audit characteristics and tax aggressiveness.

The sample excludes companies in the financial sector, companies without industry information, companies lacking data for ROA, LEV, and SIZE variables, companies with negative LAIR, and companies with ETR less than 0 or greater than 1 (Lopo Martinez et al., 2023). Additionally, companies without auditors' opinion data were removed.

**TABLE 1:**  
Composition and Selection of the Research Sample

	Description	Observations
	Active companies listed on B3 from 2017 to 2022	401
-	Companies in the financial sector	61
-	Companies without sector information	1
=	Companies investigated	339
×	Years investigated (2017 to 2022)	6
=	Initial number of observations (companies/year)	3,390
-	Lack of information for the control variables	533
-	Negative LAIR	1.336
-	Observations with ETR less than 0 or greater than 1	250
=	Final sample	1,271

Source: Prepared by the authors.

The initial dataset comprised 2,034 observations from 339 companies. After applying the exclusion criteria, the final sample was reduced to 1,271 observations. The sample size allows for robust statistical analysis and ensures that the findings are generalizable to the population of interest. Since only observations with missing control variables were eliminated, the resulting panels may have different numbers of observations for each tax aggressiveness proxy. The data processing and sample selection procedures were implemented using the Python programming language and the Pandas library.

### 3.3 Analysis of Auditors' Opinions

The methodology for analyzing auditors' opinions aims to understand the relationship between their characteristics and companies' tax aggressiveness. This analysis was conducted using Python and several specialized libraries to process and standardize various data types and formats. The following steps outline the process:

- *PDF text extraction:* The PyPDF2 library was utilized to extract text from the PDF files of auditors' opinions, enabling computational analysis.
- *Character count:* The total number of characters in each opinion was counted, providing a metric for the document length variable.
- *Identification of caveats:* Caveats were identified by processing the content of the auditors' reports to detect any reservations or qualifications.
- *Analysis of Verbal Tone:* The verbal tone of the auditors' opinions was analyzed by detecting the presence of positive and negative words from a predefined dictionary, allowing assessment of the overall tone. This task employed the re library for regular expressions (Chantziaras et al., 2021; Henry, 2008; Ferreira et al., 2019).
- *Readability Calculation:* Readability was assessed using metrics such as the Flesch Reading Ease Index or the Gunning Fog Index to determine how easily the documents can be read and interpreted (Souza & Borba, 2022). The text processing involved Natural Language Processing (NLP) techniques using the Natural Language Toolkit (NLTK) library, and scripts from the Pylinguistics repository were used for word classification.
- *Integration of results:* The various metrics and analyses were consolidated into a unified dataset, enabling comprehensive analysis of the relationship between auditors' opinion characteristics and companies' tax aggressiveness.

This methodology provides a robust approach to exploring correlations between specific attributes of auditors' opinions and the tax practices adopted by companies. By leveraging advanced data processing techniques and libraries such as PyPDF2, re, NLTK, and Pylinguistics, the study effectively extracts and analyzes relevant information from auditors' reports. This computational approach enhances the objectivity and replicability of the analysis.

Tests for normality, multicollinearity, and independence were conducted to ensure the statistical validity of the regression model. These tests confirm that the assumptions underlying the multiple linear regression are met, ensuring reliable and interpretable results.

The integration of financial data with textual analysis of auditors' opinions allows for a comprehensive examination of the factors influencing tax aggressiveness. By combining quantitative financial metrics with qualitative textual characteristics, the study provides a multifaceted perspective on how auditors' communications may reflect or influence corporate tax behaviors. This holistic approach aligns with the study's objective of uncovering the interplay between audit reporting and tax strategies.



### 3.4 Econometric Model and Variables

#### 3.4.1 Econometric model

The study employs a multiple linear regression model to investigate the relationship between the characteristics of auditors' opinions and corporate tax aggressiveness. The model is specified to capture the effects of audit opinion characteristics on tax aggressiveness, controlling for relevant financial variables and fixed effects. The general form of the econometric model is:

$$\begin{aligned} TaxAgg_{i,t} = & \beta_0 + \beta_1 RES_{i,t} + \beta_2 Length_{i,t} + \beta_3 LEG_{i,t} + \beta_4 TON_{i,t} + \beta_5 Big4_{i,t} + \beta_6 ROA_{i,t} + \beta_7 LEV_{i,t} \\ & + \beta_8 SIZE_{i,t} + IndFE_{i,t} + \epsilon_{i,t} \end{aligned} \quad (\text{Equation 1})$$

Where:

- $TaxAgg_{i,t}$ - Tax aggressiveness measure for company (i) at time (t). This can be one of the following proxies:
  - $BTD_{i,t}$ : book-tax differences;
  - $ETR_{i,t}$ : effective tax-rate;
  - $TTVA_{i,t}$  tax rate on added value.
- $RES_{i,t}$  dummy: Dummy variable indicating the presence of a reservation (caveat) in the auditor's opinion (1 if present, 0 otherwise).
- $Length_{i,t}$ : Length of the auditor's opinion, measured by the number of characters.
- $LEG_{i,t}$ : Readability metric of the auditor's opinion, measured using;
  - Modified Flesch Reading Ease Score  $flsech_{mod_{i,t}}$ ;
  - Gunning Fog Index  $fog_{mod_{i,t}}$
- $TON_{i,t}$ : Verbal tone of the auditor's opinion.
- $Big4_{i,t}$ : Dummy variable equal to 1 if the firm was audit by a Big4 firm, and 0 otherwise
- $ROA_{i,t}$ : Return on assets.
- $LEV_{i,t}$ : Financial leverage.
- $SIZE_{i,t}$ : Company size, measured as the natural logarithm of total assets.
- $IndFE_{i,t}$ : Fixed effects by industry sector.
- $\epsilon_{i,t}$ : Error term.

#### 3.4.2 Dependent variables

##### 3.4.2.1 *BTD: Book-Tax Differences*

- **Behavior:** Positively related to tax aggressiveness.

BTD is the difference between taxable profit and accounting profit, according to its operational formula (Lopo Martinez et al., 2023):

$$BTD_{i,t} = \frac{PBIT_{i,t} - (Corp\_Income\_Tax\_Expense_{i,t}/0,34)}{TotalAssets_{i,t}}$$

Where:

- The denominator 0.34 represents the combined corporate income tax rate in Brazil (25% IRPJ + 9% CSLL).

A higher BTD indicates greater disparities between accounting and taxable profits, suggesting more aggressive tax practices (Hartmann & Martinez, 2020; Schluchting, 2023).

#### 3.4.2.2 ETR: Effective Tax Rate

- **Behavior:** Negatively related to tax aggressiveness.

ETR measures the actual tax burden of a company relative to its pre-tax income:

$$ETR_{i,t} = \frac{\text{Corporate Income Tax Expense}_{i,t}}{PBIT_{i,t}} \quad (\text{Equation 3})$$

A lower ETR implies higher tax aggressiveness, as the company pays less tax relative to its earnings (Lopo Martinez et al., 2023).

#### 3.4.2.3 TTVA: Tax Rate on Value Added

- **Behavior:** Negatively related to tax aggressiveness.

TTVA assesses the tax burden on a company's value added, considering taxes on profits and revenues:

$$TTVA_{i,t} = \frac{\text{Tax Burden on the SVA}_{i,t}}{\text{Total Value Added}_{i,t}} \quad (\text{Equation 4})$$

A lower TTVA value indicates higher tax aggressiveness (Chiachio & Martinez, 2019).

### 3.4.3 Independent variables

#### 3.4.3.1 RES (Reservation in Opinion)

- **Expected sign:** Positively related to tax aggressiveness.

RES is a dummy variable that equals 1 if the auditor's opinion contains a reservation or caveat, and 0 otherwise. Reservations may signal accounting issues associated with aggressive tax practices (Chantziaras et al., 2021).

### 3.4.3.2 Length

- **Expected sign:** positively related to tax aggressiveness.

Length measures the verbosity of the auditor's opinion, serving as a proxy for the complexity of the issues addressed:

$$Length_{i,t} = Quantity\_Characters\_Report_{i,t} \quad (\text{Equation 5})$$

Longer opinions may reflect more extensive explanations necessitated by aggressive tax positions (Moreira et al., 2016).

### 3.4.3.3 Readability (LEG)

Readability assesses how easily the auditor's opinion can be understood. Two indices are employed:

#### 3.4.3.3.1 Modified Flesch Reading Ease Score (flesch\_mod)

- **Expected sign:** Negatively related to tax aggressiveness.

$$flesch\_mod_{i,t} = \ln \left( 206,835 - \left( 1,015 \frac{words_{i,t}}{Phrases_{i,t}} \right) - \left( 84,6 \frac{complex\_words_{i,t}}{Words_{i,t}} \right) \right) \quad (\text{Equation 6})$$

A higher score indicates better readability (Souza & Borba, 2022).

#### 3.4.3.3.2 Modified Gunning Fog Index (fog\_mod)

- **Expected sign:** Negatively related to tax aggressiveness.

$$fog\_mod_{i,t} = -0,4 \left( \frac{words_{i,t}}{phrases_{i,t}} + \frac{complex\_words_{i,t}}{phrases_{i,t}} \right) \quad (\text{Equation 7})$$

Lower Fog Index values indicate better readability (Souza & Borba, 2022).

### 3.4.3.4 TONE

- **Expected sign:** Negatively related to tax aggressiveness.

TONE measures the sentiment conveyed in the auditor's opinion:

$$TONE_{i,t} = \left( \frac{Q_{positive_{i,t}} - Q_{negative_{i,t}}}{Q_{total_{i,t}}} \right) \times 1000$$

(Equation 8)

A more negative tone may be associated with higher tax aggressiveness (Ferreira et al., 2019; Chantziaras et al., 2021).

#### 3.4.3.5 Big5

- **Expected sign:** Negatively related to tax aggressiveness.

A dummy variable indicating if the auditor is a Big Four firm (1 if yes, 0 otherwise). Companies audited by Big Four firms may exhibit less tax aggressiveness due to stricter auditing standards (Hartmann & Martinez, 2020).

#### 3.4.4 Control variables

##### 3.4.4.1 ROA

- **Expected sign:** Positively related to tax aggressiveness.

ROA is an index that measures a company's profitability in relation to its total assets. It is calculated by dividing net profit by the company's total assets. Higher profitability may incentivize aggressive tax strategies (Almeida et al., 2021).

##### 3.4.4.2 LEV

- **Expected sign:** Positively related to tax aggressiveness.

LEV is a measure that reflects the proportion of third-party capital in relation to a company's own capital. Companies with higher leverage might engage in tax planning to maximize tax benefits from interest deductions (Almeida et al., 2021; Martinez, 2020).

##### 3.4.4.3 SIZE

- **Expected sign:** Positively related to tax aggressiveness.

SIZE represents the company's scale. Larger companies may have more resources to engage in aggressive tax planning (Almeida et al., 2021; Hartmann & Martinez, 2020).

**TABLE 2:**  
VARIABLE OF INTEREST

Variable Type	Acronym	Description	Calculation Formula	Expected Sign	Previous Research
<b>Dependent Variables</b>					
	BTD	Book-Tax Differences	See Equation (2)	Positive (+)	Hartmann & Martinez (2020); Almeida et al. (2021); Chiachio & Martinez (2019)
	ETR	Effective Tax Rate	See Equation (3)	Negative (-)	Hartmann & Martinez (2020); Almeida et al. (2021); Chiachio & Martinez (2019)
	TTVA	Tax Rate on Value Added	See Equation (4)	Negative (-)	Chiachio & Martinez (2019)
<b>Independent Variables</b>					
	RES	Presence of Reservation in Opinion	Dummy variable (1 if reservation present, 0 otherwise)	Positive (+)	Chantziaras et al. (2021)
	Length	Length of Auditor's Opinion	Total number of characters	Positive (+)	Moreira et al. (2016)
	flesch_mod	Modified Flesch Reading Ease Score	See Equation (6)	Negative (-)	Souza & Borba (2022)
	fog_mod	Modified Gunning Fog Index	See Equation (7)	Negative (-)	Souza & Borba (2022)
	TONE	Verbal Tone of Opinion	See Equation (8)	Negative (-)	Ferreira et al. (2019); Chantziaras et al. (2021)
	Big4	Auditor is a Big Four Firm	Dummy variable (1 if Big Four, 0 otherwise)	Negative (-)	Hartmann & Martinez (2020)
<b>Control Variables</b>					
	ROA	Return on Assets	$EBIT / Total Assets_{t-1}$	Positive (+)	Almeida et al. (2021); Hartmann & Martinez (2020); Chiachio & Martinez (2019)
	LEV	Leverage	Total Debt / Total Assets	Positive (+)	Almeida et al. (2021); Martinez (2020)
	SIZE	Company size	$\text{Log}(\text{Total Assets})$	Positive (+)	Chiachio & Martinez (2019)

**Notes:**

Expected Sign indicates the hypothesized relationship with tax aggressiveness.

- Positive (+): Variable is expected to be positively related to tax aggressiveness.
- Negative (-): Variable is expected to be negatively related to tax aggressiveness.

## 4 Data Analysis

After constructing the sample and specifying the econometric model, we proceed to analyze the data to gain insights into the behavior of the variables, both individually and collectively. Our primary objective is to verify whether the characteristics of the auditors' opinions signal tax aggressiveness. Initially, we present the descriptive statistics to understand the distribution of the variables. We then conduct bivariate analysis by calculating the Pearson correlation coefficients between the variables, along with their statistical significance, following the approach of Hartmann and Martinez (2020). Finally, we perform multivariate regression analyses to test the hypotheses, examining the coefficients and their significance, and discuss the model specification statistics.

Consistent with Almeida et al. (2021), the data were winsorized at the 5% level to mitigate the influence of outliers. The statistical analyses were conducted using Python's libraries, including NumPy, Pandas, SciPy, and Statsmodels.

### 4.1 Descriptive Statistics

To assess the influence of auditors' opinion characteristics on tax aggressiveness, Table 3 presents the descriptive statistics for the variables used in the study. The main tax aggressiveness proxy, Book-Tax Differences (BTD), has a mean of approximately 3.4% with a standard deviation of 3.7%. This indicates that, on average, there is a difference between accounting profit and taxable profit in the sample, consistent with findings by Lopo Martinez et al. (2023). The coefficient of variation for BTD is about 1.09, suggesting a high relative variability even after winsorization.

The other two proxies for tax aggressiveness, the Effective Tax Rate (ETR) and the Tax on Value Added (TTVA), have means of 21.8% and 28.5%, respectively, suggesting a considerable level of tax aggressiveness in the sample. Lower ETR and TTVA values indicate higher tax aggressiveness. The ETR mean is close to that reported by Almeida et al. (2021).

Among the control variables, company size (SIZE), measured as the natural logarithm of total assets, shows the least variation, indicating a relatively uniform company size within the sample, similar to results reported by Almeida et al. (2021). The average leverage (LEV) is 56.4%, and the average return on assets (ROA) is 7.17%.

Regarding the variables derived from the auditors' opinions, we observe low relative variability for Length (the total number of characters in the opinion), flesch\_mod (modified Flesch Reading Ease score), and fog\_mod (modified Gunning Fog Index). This suggests that the length and readability of the auditors' opinions vary little across the sample, and we aim to investigate how this uniformity may influence tax aggressiveness. The TONE variable, representing the verbal tone of the auditors' opinions, has a positive mean of 4.588, indicating a slightly positive tone on average, with greater variability compared to the other textual variables.

The variable RES, indicating the presence of a reservation in the audit opinion (RES = 1 if there is a reservation), shows that only 1.8% of the sample had reservations.

By analyzing these descriptive statistics, we set the foundation to examine the impact of auditors' opinion characteristics on tax aggressiveness.

**TABLE 3**  
DESCRIPTIVE STATISTICS

Variables	N	Average	Standard Deviation	min	Q1	Median	Q3	Max
BTD	1,271	.034	0.037	-.014	.007	.024	.052	1.093
ETR	1,271	.218	0.125	0.018	0.124	0.215	0.299	0,575
TTVA	1,095	.285	0.157	0.065	0.179	0.258	0.358	0.550
ROA	1,271	7.165	5.130	0,897	3.166	5.888	7.505	9.875
LEV	1,271	.564	0.197	0.180	0.433	0.573	0.704	0.750
SIZE	1,271	15.028	1.739	11.665	13.854	15.146	16.319	16.500
BIG4	1,271	.751	0.433	0	1	1	1	1
LENGH	1,271	13,807	4,030	4,099	12,112	14,257	16,485	19.701
TONE	1,271	4.588	1.594	1.689	3.459	4.481	5.756	7.605
RES	1,271	0,018	0,133	0	0	0	0	1
flesch_mod	1,271	4.802	0.067	4.583	4.787	4.819	4.842	4.871
fog_mod	1,271	-18.055	3.001	-27.387	-18.837	-17.32	-16,202	-14.776

**Note:** BTD: Book-Tax Differences; ETR: Effective Tax Rate; TTVA: Tax on Value Added Rate; ROA: Return on Assets; LEV: Leverage; SIZE: Natural logarithm of total assets; BIG4: Dummy variable indicating audit by Big Four firm; Length: Number of characters in the auditor's opinion; TONE: Verbal tone of the auditor's opinion; flesch\_mod: Modified Flesch Reading Ease score; fog\_mod: Modified Gunning Fog Index.

Source: Prepared by the authors

## 4.2 Correlation Matrix

Once the distribution of the variables had been analyzed, the bivariate analysis began. The data is shown in Table 4. For the rest of the analysis, the significance levels of 10%, 5% and 1% will be represented respectively by \*, \*\* and \*\*\*. This analysis is crucial to understand how the characteristics of the auditors' opinions correlate with measures of tax aggressiveness. The first piece of information to look at is the correlation between the dependent variables and the rest of the variables, i.e. interpreting the correlations between BTD, ETR and TTVA and the independent and control variables. First, however, it is important to analyze the value of the correlations between the tax aggressiveness metrics. Based on the definitions of the *proxies*, we would expect BTD to be negatively correlated with ETR and TTVA - a result that is confirmed. Finally, we see that ETR and TTVA have a positive and significant correlation, maintaining consistency with the description of the *proxies*.

Moving on, the control variables ROA and LEV show a significant correlation with the three tax aggressiveness proxies. Noteworthy is the correlation between ROA and BTD, of approximately 0.739, a result in line with studies. If LEV and SIZE have a negative correlation with BTD, one would expect the opposite sign for ETR and TTVA (and indeed this relationship is found, with SIZE being significant only with TTVA).

With regard to the information content variables, which include characteristics of the auditors' opinions, it is worth noting that the *readability* variables only showed a significant correlation with BTM. The low level of variability in the sample may help to interpret the lack of significance and small correlation. In view of the research by Souza and Borba (2022), the correlation between SIZE and readability had the same sign, but the result in relation to LEV was contradictory. The TONE variable has a negative correlation with BTM, suggesting that a negative tone may be associated with higher levels of tax aggressiveness. The three variables strongly dependent on the structure of the text (they depend on the choice of words and sentence formation), TONE, flesch\_mod and fog\_mod, showed a lower correlation (in module) with TTVA than with the other *proxies*. This information suggests that the characteristics of auditors' opinions may have varying degrees of influence on different measures of tax aggressiveness, which is central to our research objective. The confirmation of this conjecture is a function of the regression analysis that will be carried out later.

RES showed a significant correlation with BTM and ETR, and was negative for BTM and TTVA, with contradictory results in relation to the increase in tax aggressiveness in the presence of a caveat for sample a in question.



**TABLE 4: CORRELATION MATRIX**

Variables	BTD	ETR	TTVA	ROA	LEV	SIZE	BIG4	Length	TONE	RES	flesch_mod	fog_mod
BTD	1.000											
ETR	-0.716***	1.000										
TTVA	-0.235***	0.246***	1.000									
ROA	0.739***	-0.298***	-0.092***	1.000								
LEV	-0.262***	0.189***	0.136***	-0.237***	1.000							
SIZE	-0.154***	0.063**	0.223***	-0.207***	0.236***	1.000						
BIG4	-0.063**	0.027	0.069**	-0.111***	0.004	0.385***	1.000					
Length	-0.078***	0.112***	0.118***	0.000	0.134***	0.284***	0.047*	1.000				
TONE	-0.023	0.021	0.053*	-0.059**	0.026	0.054*	0.155***	-0.262***	1.000			
RES	-0.054*	0.037	-0.024	-0.060**	0.059**	-0.032	-0.045	0.051*	0.005	1.000		
flesch_mod	-0.036	0.025	-0.012	-0.024	-0.044	-0.168***	-0.034	-0.041	-0.025	-0.013	1.000	
fog_mod	-0.043	0.034	-0.005	-0.023	-0.039	-0.168***	-0.040	-0.020	-0.038	-0.023	0.992***	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

BTD: Book-Tax Differences; ETR: Effective Tax Rate; TTVA: Tax on Value Added Rate; ROA: Return on Assets; LEV: Leverage; SIZE: Total Assets; RES: Disclaimer in Audit Opinion; BIG4: Audit by Big Four; TAM: Audit Opinion Size; TONE: Tone of the Audit Opinion; flesch\_mod: Flesch Readability Index; fog\_mod: Fog Readability Index.

Source: Prepared by the authors.

### 4.3 Regression Analysis

This section summarizes the outcomes of regression models targeting key dependent variables: tax aggressiveness measured via Book-Tax Differences (BTD), Effective Tax Rate (ETR), and Total Tax and Value Added (TTVA). The models are designed to examine whether the characteristics of the auditors' opinions influence tax aggressiveness, directly addressing our research objective. These models were structured using independent variables selected based on the discussed theoretical framework. The analysis assesses how these variables correlate with corporate tax aggressiveness and evaluates the alignment with theoretical expectations.

Table 5 outlines regression results, including estimated coefficients, p-values, and fit statistics for each variable: (i) Coefficient Interpretation examines the influence of variables on tax aggressiveness, highlighting their magnitude and direction. (ii) Statistical Significance notes coefficients significant below 5% or 10% p-values, indicating strong relationships. (iii) Model Fit is evaluated with adjusted R-squared and F-statistic, showing how well variables explain the variance in tax aggressiveness and their overall impact. This analysis sheds light on how variables drive corporate tax behavior.

The results obtained for each of the dependent variables of interest: BTD, ETR and TTVA. The six models run showed significance at the 1% level using the F-test, i.e. there is statistical evidence that the hypothesis that all the model's coefficients are equal to zero can be rejected.

A readability metric was used for each tax aggressiveness proxy. Notably, the readability measures (flesch\_mod and fog\_mod) exhibited a very high correlation (0.985), reflecting their similar mathematical definitions. This high correlation underscores the importance of readability as a characteristic of auditors' opinions that may influence tax aggressiveness. As a consequence, the models fitted exhibited almost identical coefficients when switching between the readability proxies, with only minor differences observed in the intercept of the BTD model.

BTD and ETR displayed a high negative correlation, and their accounting definitions reveal a symmetry of signs between the models. Specifically, BTD is positively related to tax aggressiveness, while ETR is negatively related.

#### **BTD Models**

The BTD models demonstrated the highest R-squared values, which can be attributed to the high correlation between ROA and BTD, consistent with previous findings. The sign of ROA aligns with estimates by Almeida et al. (2021) and Hartmann and Martinez (2020). To verify the hypotheses in this model, we analyzed the signs and significance of the coefficients:

- The significant variables in the models are ROA and LEV.
- All information content variables (TONE, flesch\_mod, fog\_mod), representing characteristics of the auditors' opinions, showed negative signs, suggesting that, for the data analyzed, they exhibited the expected behavior as outlined in hypotheses H3 and H4. This supports our objective of identifying the influence of auditors' opinion characteristics on tax aggressiveness.
- However, the behavior predicted for Length and RES (related to hypotheses H1 and H2) was not observed.

#### **ETR Models**

In the ETR models, the symmetry of signs was evident, with the exception of the intercept and flesch\_mod. All three control variables (ROA, LEV, SIZE) were significant, showing a negative relationship with ETR and, consequently, a positive relationship with tax aggressiveness. Analyzing the signs:

- TONE and fog\_mod showed the expected behavior consistent with H3 and H4.
- Once again, H1 and H2 were not supported, as Length and RES did not show the expected signs or significance.

### TTVA Models

The TTVA changing the readability variable had no effect on the sign of any variable, as anticipated. Despite the lack of significance in some variables:

- TONE again exhibited its expected behavior, showing a negative relationship with tax aggressiveness, thus corroborating H3 and emphasizing the role of auditors' opinion characteristics.
- The readability metrics (flesch\_mod and fog\_mod) did not exhibit the expected behavior for H4.

### Summary of Findings

The results from the regression analyses present mixed evidence regarding the proposed hypotheses:

- Hypothesis H1: There is partial support for the hypothesis that the length of the audit opinion is associated with tax aggressiveness. While Length was significantly associated with BTD and TTVA, the direction of the relationship varied across models.
- Hypothesis H2: The variable representing disclaimers in audit opinions (RES) was not significant in any model, providing no support for this hypothesis.
- Hypothesis H3: The tone of the audit opinion showed a marginally significant positive relationship with TTVA, suggesting limited support for the hypothesis that a more positive tone is associated with lower tax aggressiveness.
- Hypothesis H4: The readability metrics did not show significant relationships with any of the tax aggressiveness proxies, offering no support for this hypothesis.

It is noteworthy that the control variables ROA, LEV, and SIZE were significant in several models, highlighting their importance in understanding tax aggressiveness. The consistent negative relationship between ROA and ETR indicates that profitability plays a crucial role in tax planning strategies.

Additionally, none of the models exhibited high Variance Inflation Factors (VIFs), suggesting that multicollinearity was not a concern in the analyses. However, tests for the assumptions of independence and normality of residuals using the Durbin-Watson and Jarque-Bera tests indicated potential violations. This suggests that while the OLS regression models provide valuable insights, future research could benefit from alternative estimation methods or robustness checks to address these issues.

**TABLE 5**  
POOLED OLS REGRESSION MODELS

$$\text{Model: } TaxAgg_{i,t} = \beta_0 + \beta_1 RES_{i,t} + \beta_2 TAM_{i,t} + \beta_3 LEG_{i,t} + \beta_4 TOM_{i,t} + \beta_5 BIG4_{i,t} + \beta_6 ROA_{i,t} + \beta_7 LEV_{i,t} + \beta_8 SIZE_{i,t} + \epsilon_{i,t}$$

	BTD	BTD	ETR	ETR	TTVA	TTVA
ROA	0.005*** (0.000)	0.005*** (0.000)	-0.007*** (0.001)	-0.007*** (0.001)	-0.001 (0.001)	-0.001 (0.001)
LEV	-0.017*** (0.004)	-0.017*** (0.004)	0.077*** (0.018)	0.077*** (0.018)	0.064*** (0.024)	0.064*** (0.024)
SIZE	0.001 (0.001)	0.001 (0.001)	-0.004* (0.002)	-0.004* (0.002)	0.017*** (0.003)	0.017*** (0.003)
BIG4	0.001 (0.002)	0.001 (0.002)	0.002 (0.009)	0.002 (0.009)	-0.007 (0.011)	-0.007 (0.011)
Length	-0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000** (0.000)
TOM	-0.000	-0.000	0.003	0.003	0.005*	0.005*

	(0.000)	(0.000)	(0.002)	(0.002)	(0.003)	(0.003)
RES	-0.000	-0.000	0.005	0.005	-0.037	-0.037
	(0.005)	(0.005)	(0.033)	(0.033)	(0.031)	(0.031)
flesch_mod	-0.011		0.036		0.053	
	(0.011)		(0.049)		(0.064)	
fog_mod		-0.000		0.001		0.002
		(0.000)		(0.001)		(0.001)
Constant	0.058	-0.000	0.047	0.239***	-0.311	-0.030
	(0.054)	(0.008)	(0.241)	(0.040)	(0.318)	(0.050)
Observations	1271	1271	1271	1271	1095	1095
R-squared	0.561	0.561	0.117	0.118	0.066	0.067
Prob > F	1,60E-128	8,82E-129	2,58E-26	1,99E-26	2,55E-10	2,26E-10

Standard errors are in parentheses

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

BTD: Book-Tax Differences; ETR: Effective Tax Rate; TTVA: Tax on Value Added Rate; ROA: Return on Assets; LEV: Leverage; SIZE: Total Assets; RES: Disclaimer in Audit Opinion; BIG4: Audit by Big Four; TAM: Audit Opinion Size; TONE: Tone of the Audit Opinion; flesch\_mod: Flesch Readability Index; fog\_mod: Fog Readability Index.

Source: Prepared by the authors.

## 5 Conclusion

This study aimed to verify whether the characteristics of auditor opinions signal corporate tax aggressiveness. By investigating the influence of independent auditors' opinions on the tax aggressiveness practices adopted by companies listed on the Brazilian stock exchange (B3) between 2017 and 2022, the research utilized a multiple linear regression model and employed three distinct metrics to measure tax aggressiveness: book-tax differences (BTD), effective tax rate (ETR), and tax rate on value added (TTVA). The analysis focused on variables derived from the auditors' opinions, such as length, readability, and tone.

The findings indicated that the informational content variables did not exhibit strong correlations or statistical significance in the regression model. This suggests that the characteristics of auditor opinions, such as length, readability, and tone, may not be reliable predictors of tax aggressiveness in the Brazilian context during the studied period.

The uniformity in the structure of auditor opinions may limit the variability to the choice of words, with the tone variable showing the most promise among the informational content variables. This suggests that the verbal tone used in auditor opinions may have the potential to detect hidden signals in companies' results. This result aligns with the conclusions of Souza and Borba, who found that readability measures may not effectively capture the nuances of corporate disclosures in certain contexts.

However, the variable representing the tone of the auditors' opinions showed the most potential among the informational content variables. This suggests that the verbal tone used in auditors' opinions may have the capacity to detect hidden signals in companies' results. This finding is consistent with previous research emphasizing the importance of linguistic cues in financial communications.

The measures of readability proved ineffective in indicating tax aggressiveness, despite the modified Gunning Fog index displaying the expected behavior for the BTD and ETR models. The correlation of readability variables with tax aggressiveness proxies was not significant and consistently lower than other informational content variables. This contrasts with findings that suggest readability might influence certain financial outcomes.

Comparing these results with previous studies highlights that while certain factors like company size and profitability are often associated with tax aggressiveness, the characteristics of audit opinions may not have

a direct impact. Specifically, Hartmann and Martinez pointed out the importance of profitability measures such as ROA in relation to tax practices, suggesting that higher profitability could influence tax aggressiveness, which aligns with the control variables used in this study.

The study contributes to understanding the complex relationship between auditors' opinions and tax aggressiveness. By exploring the purpose of verifying whether the characteristics of auditor opinions signal corporate tax aggressiveness, it was found that the model specification requires improvement, as statistical tests indicate poor compliance with regression assumptions. Future research could include additional control variables and refine the metrics used to measure informational content. Additionally, qualitative methodologies, such as interviews with auditors, could provide deeper insights into how audit opinions may reflect or influence tax aggressiveness practices.

In conclusion, while the informational content variables derived from auditors' opinions did not show strong predictive power, the study verified that the characteristics of auditor opinions may not signal corporate tax aggressiveness. The findings underscore the importance of considering multiple measures of tax aggressiveness and the potential of verbal tone in audit communications. The study highlights the need for further research to better understand the factors influencing tax aggressiveness and the role of auditors' opinions in this context, taking into account the limitations of the current model and the opportunities for methodological refinements.

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## **DADOS DOS AUTORES**

### **Antonio Lopo Martinez**

Researcher at the University of Coimbra Institute for Legal Research

PhD in Law (University of Coimbra/University of Salamanca); PhD in Accounting (FEA-USP); Master's in Administration (University of California, Berkeley)

Email: [almartinez@fd.uc.pt](mailto:almartinez@fd.uc.pt)

ORCID: 0000-0001-9624-7646

### **Fernando Ferreira dos Santos**

Master's in Accounting (Fucape Business School)

Email: [f.f\\_santos@hotmail.com](mailto:f.f_santos@hotmail.com)

ORCID: <https://orcid.org/0000-0003-0875-5021>

### **César Valentim de Oliveira Carvalho Júnior**

Professor at the Federal University of Bahia

PhD in Accounting (FEA-USP)

Email: [cesarvalentim@ufba.br](mailto:cesarvalentim@ufba.br)

ORCID: 0000-0003-0387-0872

### **Sergio Augusto Pereira Bastos**

Professor at Fucape Business School

PhD in Business Administration (PUC-RJ)

Email: [sbastos@fucape.br](mailto:sbastos@fucape.br)

ORCID: 0000-0002-5697-3624

### **Josiel Caldas Rodrigues**

Federal Institute of Maranhão

Master's in Accounting (Fucape Business School)

Email: [j.kurttt@yahoo.com.br](mailto:j.kurttt@yahoo.com.br)

ORCID: 0009-0007-8430-6339

## Contribuição dos Autores:

Contribuição	Antonio Lopo Martinez	Fernando Ferreira dos Santos	César Valentim de Oliveira Carvalho Júnior	Sergio Augusto Pereira Bastos	Josiel Caldas Rodrigues
1. Concepção do assunto e tema da pesquisa	100%				
2. Definição do problema de pesquisa	50%	50%			
3. Desenvolvimento das hipóteses e constructos da pesquisa (trabalhos teórico-empíricos)	50%	50%			
4. Desenvolvimento das proposições teóricas (trabalhos teóricos os ensaios teóricos)	25%	25%	25%	25%	
5. Desenvolvimento da plataforma teórica	25%	25%	25%	25%	
6. Delineamento dos procedimentos metodológicos	25%	25%	25%	25%	
7. Processo de coleta de dados		50%			50%
8. Análises estatísticas		75%			25%
9. Análises e interpretações dos dados coletados	25%	25%	25%	25%	
10. Considerações finais ou conclusões da pesquisa	25%	25%	25%	25%	
11. Revisão crítica do manuscrito	25%	25%	25%	25%	
12. Redação do manuscrito	25%	25%	25%	25%	