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. 18, n. 3, art. 6, p. 407-426, Jul./Sep. 2024 | DOI: http://dx.doi.org/10.17524/repec.v18i3.3444 | ISSN 1981-8610

The Moderating Role of Corporate Reputation on the Effect of CSR on Tax Aggressiveness

Hellen Karla de Araújo Ideião Bizerra
https://orcid.org/0009-0002-1328-7875

Yahmany Fontenelle Abrahim
https://orcid.org/0009-0009-8420-7634

Robério Dantas de França
https://orcid.org/0000-0001-8204-7803

Wenner Glaucio Lopes Lucena
https://orcid.org/0000-0002-2476-7383

Abstract

Objective: This study analyzed the influence of corporate reputation (CR) as a moderator of the effect of corporate social responsibility (CSR) on the tax aggressiveness of companies listed on B3.

Method: The sample included 106 publicly traded companies listed on the Brazilian stock exchange from 2010 to 2021, generating 1,272 observations. The panel data model was used for data analysis. The proxy for CR was the Exame Magazine Yearbook classification. For CSR, the Refinitiv Eikon® ESG score was collected. The Normalized Differential ETR was used as a proxy for tax aggressiveness.

Results: The results showed a negative relationship between tax aggressiveness and CR and no statistical significance between tax aggressiveness and CSR. However, the relationship is reversed when CR moderates CSR, which can be explained by the Moral Licensing Theory, in which companies with moral credits (represented by CR and high levels of CSR) would use their moral license to be more aggressive.

Contributions: This study proposes the Normalized Differential ETR, a measure of tax aggressiveness intended to obtain greater precision and reliability. Additionally, an innovative contribution is the analysis of the moderating role of CR on the effect of CSR on aggressiveness.

Keywords: Tax Aggressiveness; Corporate reputation; CSR.

Published in Portuguese and English. Original Version in Portuguese.

Round 1: Received in 11/9/2023. Review requested on 12/9/2023. Round 2: Resubmited on 1/19/2024. Accepted on 4/10/2024 by Gerlando Augusto Sampaio Franco de Lima, PhD (Editor). Published on 9/30/2024. Organization responsible for the journal: Abracicon.

1. Introduction

Tax aggressiveness is related to the companies' pursuit to maximize results. However, some companies perform Corporate Social Responsibility (CSR) actions that are not necessarily intended to obtain higher financial returns only, as they also expect to benefit the environment and society. Such actions even influence the decision-making of some investors, who, against the classical economic theory, would not seek to maximize their profits only but also consider how their investment benefits society. In addition to CSR, corporate reputation (CR) is another indicator that companies seek to gain more notoriety. Research on tax planning indicates that CSR and CR impact a company's tax aggressiveness (Martinez, 2017).

Tax aggressiveness is not illegal per se, but it may be considered abusive and represent a risk for a company if tax authorities question its actions and deem its behavior abusive, as Martinez (2017) notes. Some proxies are used to identify tax aggressiveness, such as Book-tax difference (BTD), which deals with the difference between accounting profit and taxable profit, and Effective Tax Rate (ETR), in which a lower ETR indicates a higher level of tax aggressiveness. In this paper, Normalized Differential ETR is adopted.

As companies engage in tax aggressiveness to maximize their results, Santos (2016) notes that it may represent an additional tool for companies to practice opportunism so that state tax inspection would function as an external governance mechanism, i.e., companies would weigh their actions according to the probability of being detected by tax authorities. However, some companies adopt these practices not necessarily to obtain higher financial returns, which is the case of companies making socially responsible investments (Guzavicius *et al.*, 2014).

Guzavicius *et al.* (2014) argue that socially responsible companies seek to promote public welfare and protect the environment. Such a notion contradicts the classical economic theory, in which companies solely aim to maximize profits. According to Khawaja and Alharbi (2021), this economic view has a divergent aspect. For long, investors were assumed to make only rational decisions, implying that they would always seek to maximize their wealth and profits. However, as these authors have found, investors may be influenced by factors unrelated to higher financial returns, such as a company's corporate reputation.

Research on tax aggressiveness found evidence of its relationship with CSR. The studies by Lanis and Richardson (2012), Montenegro (2021), and Huseynov and Klamm (2012) show a negative relationship between CSR and tax aggressiveness. The first found a negative relationship between national governance in countries of the Organization for Economic Co-operation and Development (OECD), in which CSR plays a mediating role in tax evasion. The second study investigates tax aggressiveness using two proxies associated with different dimensions of CSR, also finding that higher levels of CSR result in higher ETRs, i.e., lower levels of tax aggressiveness.

Regarding studies on corporate reputation, some divergences are found in the literature related to tax aggressiveness. According to Fombrun and Shanley (1990), an individual's decision considers actions that may culminate in a favorable or unfavorable reputation; a decision is more appropriate when it favors the company with the best reputation. Therefore, decision-makers might consider reputation when engaging with more aggressive tax practices. Studies analyze to what extent companies consider their reputation when attempting to perform such practices.

Although every action incurs a certain level of reputational risk, one explanation provided by the literature is that more aggressive tax practices are associated with the Moral Licensing Theory (MLT). According to Bai *et al.* (2017), an entity may be granted a moral license to commit dubious actions in the present given its past good deeds, i.e., past actions would ensure a company's higher reputation in the present, so that its "moral credits" would prevent hurting its reputation.

Therefore, except in some specific cases, companies with higher overall CSR indices present lower tax aggressiveness levels, while companies with a corporate reputation may or may not adopt higher tax aggressiveness, depending on the context in which they operate. Companies with higher CSR may also have a strong reputation.

López-González, Martínez-Ferrero, and García-Meca (2019) note that concern with CSR may emerge from incentives, such as having a good corporate reputation and a favorable image. Fombrun (2007) explains that companies focus on CSR practices to create a good reputation. Hence, these studies indicate that these two constructs might be associated. On the one hand, studies find evidence that CSR (Lanis, Richardson, 2012; Huseynov, Klamm, 2012; Melo et al., 2020) and corporate reputation (Bai; Lobo; Zhao, 2017; França; Monte, 2020; Dhaliwal et al., 2022; Santos; França, 2022) are individually related with tax aggressiveness. However, considering that one aspect may influence the other and no studies have analyzed the relationship between these two constructs and tax aggressiveness, this study aims to fill this gap by assessing the effect of being a reputable company performing socially responsible actions on tax aggressiveness.

Thus, this study assesses the relationship between reputable companies in the Brazilian context and tax aggressiveness and whether corporate reputation affects companies with higher CSR, considering that the latter are usually classified as less aggressive, while reputable companies might be more aggressive. Therefore, the following general research objective was established: identifying the influence of corporate reputation as a moderating factor of corporate social responsibility on the tax aggressiveness of companies listed on the Brazilian Stock Exchange. Thus, the research problem was established according to the following question: **What is the influence of corporate reputation as a moderating factor of corporate social responsibility on the tax aggressiveness of companies on the Brazilian Stock Exchange?**

Econometric models were used to answer this question, in which proxy Normalized Differential ETR was used for tax aggressiveness to identify companies considered more aggressive. Thus, this study provides a methodological contribution using an ETR to obtain more accurate and reliable analyses. It also contributes to knowledge by studying the moderating factor of corporate reputation on CSR and its effect on tax aggressiveness, which adds to the literature on aggressive tax planning. Finally, a practical contribution concerns facilitating stakeholders' understanding of how a company's tax behavior varies depending on its CSR practices and corporate reputation, which is relevant information for decision-making.

2. Theoretical Framework

2.1 Tax Aggressiveness

The definition of tax planning is broad and encompasses entirely legal practices, as well as aggressive and abusive practices. Note that tax aggressiveness has consequences for the companies' reputation, but not necessarily clashes with the law, unless it exceeds a certain limit and is characterized as abusive, though, such a concept depends on the tax authority's judgment. According to art. 187 of the Brazilian Civil Code, even if a company does not commit a tax evasion, i.e., commits a clearly illegal act, it may exceed the limits imposed by its economic or social purpose and good faith, thus constituting an unlawful act.

Therefore, tax aggressiveness is not considered illicit in this study, but a practice, in which a company assumes the risk of committing or being judged as having committed illegal acts, by abusing the law, to reduce its tax burden.

According to Zucolotto *et al.* (2020), Brazilian and international studies adopt ETR and BTD proxies to capture tax aggressiveness among companies, as these measures are associated with profit taxes. According to Rodrigues and Morgan (2022), companies aim to maximize profits and reduce its costs, though increased profits also result in higher taxes. Nevertheless, the Brazilian legislation presents mechanisms that allow companies to reduce their taxable base. As previously explained, such mechanisms can be managed and used aggressively.

ETR and BTD are measures commonly used to assess tax management, assessing discrepancies between the nominal tax rate (34%) and effective tax rate, as is the case of ETR; and the difference between taxable profit and accounting profit, which is reported in the income statement for the year before taxes, and concerns the BTD. In this study, the ETR was used as a proxy for tax aggressiveness.

2.2 Corporate Social Responsibility and Tax Aggressiveness: Empirical evidence

The definition and scope of corporate social responsibility and tax aggressiveness must become unmistakable. However, as Melo *et al.* (2020) note, there is no homogeneous and unquestionable definition of CSR. The main idea of this practice is that companies assume responsibilities beyond what are legally mandatory, covering environmental, social, governance, and economic issues. According to Carrol (1991), CSR implies ethical and philanthropic responsibilities.

Therefore, many studies in Accounting, Economics, and related fields have empirically tested the relationship between CSR and tax aggressiveness, such as Montenegro (2021), where a sample of OECD countries is addressed to examine the association between CSR, national governance, and tax evasion. How the interaction between the governance level and CSR affects tax evasion is also explored. His results show that the level of governance is negatively related to tax evasion. Additionally, a relationship was found for the mediating effect of national governance with CSR on evasion, i.e., the companies in countries with national solid governance and CSR (in particular, environmental disclosures) use these to mitigate reputational risks and public concern arising from tax evasion activities.

Mamede de Andrade, Rodrigues, and Cosenza (2020) found that tax management was related to ethics and CSR reports. They analyzed the financial and social responsibility information disclosed by the five leading Brazilian construction companies investigated in Brazil's Lava Jato Operation, and their results showed evidence of aggressive tax management and contradictions between tax behavior, CSR, and ethical discourse of the companies under investigation.

Lanis and Richardson (2012) studied the association between CSR and corporate tax aggressiveness. Their sample was composed of Australian businesses assessed in 2008 and 2009. Their findings show that the higher a company's level of CSR disclosure, the lower its corporate tax aggressiveness. These results remained in several specifications of the different regression models they performed. They also found that being committed to social investment, corporate strategy, ethics, and a code of business conduct are important elements of CSR that negatively impact tax aggressiveness.

Huseynov and Klamm (2012) examined the effect of three CSR measures: corporate governance, community, and diversity on the tax evasion of companies using tax services provided by S&P500 auditors. The results indicate that companies that care about the community will present higher GAAP ETR levels and Cash ETR, which is higher in companies displaying community concerns; only governance negatively affects Cash ETR, i.e., the companies were more aggressive in this case. The paper previously mentioned also shows additional evidence that CSR affects tax evasion when companies are classified according to CSR levels.

Laguir et al. (2015) conducted a study with French companies to show that the greater a company's social dimension of corporate social responsibility, the lower the level of corporate tax aggressiveness; no significance was found for the other dimensions. Laguir et al. (2015) also argue that the corporate social responsibility dimensions should not be aggregated, verifying the effect of the CSR dimensions individually, as the results may change. Finally, they verified CSR in the social, environmental, and governance contexts. The results of Melo et al. (2020) reveal a negative relationship between CSR and tax aggressiveness.

Therefore, divergent results are found in the literature regarding tax aggressiveness in some of these spheres when CSR is subdivided into different dimensions. Although, the literature generally provides evidence that companies with higher general CSR levels are less aggressive.

2.3 Corporate Reputation and Moral Licensing Theory

Reputation is the sum of various stakeholders' perceptions and might be considered part of corporate strategy, which companies seek to promote and always protect (Gallemore, Maydew and Thornock, 2014; Fombrun and Shanley, 1990). Theoretically, and according to Fombrun and Shanley (1990), companies will always weigh their attitudes, considering what might positively or negatively affect their reputation, and normally make decisions to maximize it.

Khawaja and Alharbi (2021) explain that a company's corporate reputation also influences investors' decision-making. However, there is a dilemma; according to classical economic theory, investors always seek to maximize their results. Furthermore, being a reputable company may not necessarily result in higher profits, and these companies may even adopt aggressive tax planning strategies (Buss, 2009; Guzavicius et al., 2014).

Along these lines, there is a parallel approach to the behavior of reputable companies, as discussed by Bai *et al.* (2017). Accordingly, a good reputation might influence aggressive tax planning levels from the perspective of Moral Licensing Theory. They found that more reputable companies are more likely to adopt tax aggressiveness. As noted by Merritt, Effron, and Monin (2010), such theory proposes that past actions considered good would allow companies or individuals to engage in questionable or even immoral and unethical behavior in the present. Thus, according to Merritt, Effron, and Monin (2010), reputable companies would be granted a moral license, or moral credit, for having accumulated good deeds in the past.

The findings of empirical research involving reputational costs associated with tax practices may diverge depending on the company's type of reputation. Gallemore, Maydew, and Thornock (2014) studied the reputation of companies accused of using tax shelters. They found that aggressive tax planning activities did not decrease after these companies were accused, i.e., even with their reputations at risk, the companies maintained the same levels of tax aggressiveness; little evidence was found that companies or their top executives bear significant reputational costs as a result of being accused of engaging in tax shelter activities.

Dhaliwal *et al.* (2022) investigated the incidence, assessment, and management of tax-related reputational costs during heightened scrutiny of corporate tax evasion, taking social protests in the USA in 2011 as a reference. The companies that incurred tax-mediated reputational costs were positively associated with negative media sentiment during the protest period but not during the pre- and post-protest periods. In other words, the companies behaved less aggressively in tax matters only when protests occurred; the media sentiment about a company influences it to lessen such practices.

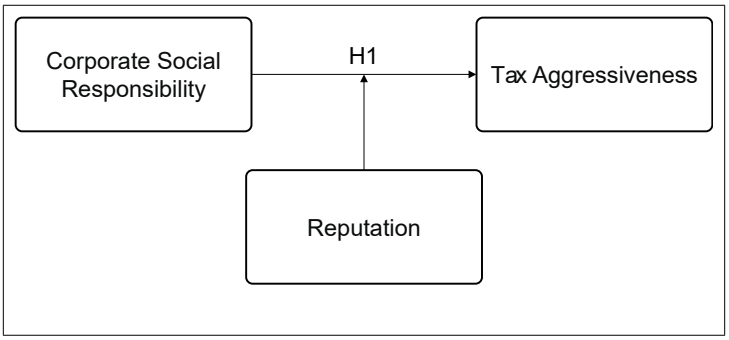
Bai *et al.* (2017) sought to identify the perception of managers and other stakeholders, observing whether high levels of tax aggressiveness are related to a company's good reputation. Their findings suggest that companies with reputation indicators use their moral license. Thus, companies may risk aggressive practices when they have a history of "good deeds", represented by a high reputation indicator, thus using their moral credits despite incurring reputational risks.

On the other hand, some studies contradict these results and reinforce that reputational costs may be a preponderant factor in implementing less aggressive tax planning. For example, Graham *et al.* (2014) interviewed tax managers worldwide to identify incentives and disincentives for more aggressive tax planning. Their results indicate that reputation is an influential factor for managers, with approximately 70% of them classifying reputation as relevant; reputation ranked second in importance among all the factors explaining why companies do not adopt specific, more aggressive tax planning practices.

Some Brazilian studies, such as Santos and França (2022), have associated reputation and tax aggressiveness. Taking companies with a weak reputation as a parameter, they found that companies with a strong reputation have, on average, higher tax expenditures. Thus, they found that a weaker reputation is associated with more aggressive practices. As explained, there is no consensus on the behavior of highly reputable companies.

In short, there may be exceptions when CSR is analyzed in different spheres; however, the literature converges with the notion that companies with higher general CSR have lower levels of tax aggressiveness. Nonetheless, there is no consensus regarding corporate reputation; there may be greater tax aggressiveness depending on the context in which a company is inserted. One factor is that companies with higher CSR may also enjoy good corporate reputation. Therefore, the following study hypothesis is proposed:

H_1: Corporate reputation positively moderates the effect of corporate social responsibility on the tax aggressiveness of companies on the Brazilian Stock Exchange.



Source: developed by the authors (2022).

Figure 1. Study Hypothesis

Figure 1 shows the research hypothesis, which aims to clarify the effect of the interaction between CSR and corporate reputation on tax aggressiveness

3. Methodological Procedures

3.1 Study Design

This study used data collected from financial statements and websites, characterizing it as documentary research. Additionally, it is a descriptive study, as it sought to identify the relationship between corporate social responsibility, corporate reputation, and tax aggressiveness. Statistical procedures and econometric models were used to analyze data; hence, a quantitative approach was adopted here.

3.2 Universe and Sample

This study's universe consists of publicly traded companies listed on the Brazilian Stock Exchange (B3). Companies that did not present data from the Refinitiv Eikon® Environmental, Social, and Governance (ESG) indicator, as well as financial companies, were excluded from the sample, as the latter are subject to different tax legislation.

Table 1 shows the composition of the study sample, totaling 106 companies.

Table 1
Sample Composition

Sample Composition	
Companies	407
(-) Companies with missing or insufficient data	282
= Companies with sufficient data	125
(-) Financial Companies	19
= Total of companies in the sample	106

Source: developed by the authors (2022).

The study period ranged from 2010 to 2021, and it began in 2010 because of the standardization of accounting standards with CPC 32—Profit tax, which affects the data collected for the tax aggressiveness proxy, the ETR.

3.3 Study Variables

The classification of Revista Exame Yearbook was used as a proxy for corporate reputation, as it provides the ranking of the Melhores & Maiores Empresas do Brasil (M&M) [Best & Largest Companies in Brazil] and is one of the leading Brazilian corporate reputation indexes (Fombrum, 2007). One "1" was assigned to companies classified in the top 100th and "0" otherwise.

The metric for CSR was the score provided by the Refinitiv Eikon® ESG performance indicator, rated on a scale from 0 (D-) to 100 (A+). Such a score is assigned to companies according to 10 factors: greenhouse gas emissions, sustainable product innovation, resources use, management, shareholders, CSR strategy, workforce, human rights, and community and product responsibility, subdivided into three dimensions: environmental, social, and governance. The Refinitiv Eikon® global score, covering all these dimensions, is used in this study as the CSR metric.

Effective Tax Rate (ETR) is usually used to measure tax aggressiveness. It measures the relationship between Total Income Tax Expenses (IRPJ in Portuguese) and Social Contribution on Net Profit (CSLL in Portuguese) with Earnings Before Tax (EBT). Equation 3.1 presents its formula.

$$ETR\ GAAP = \frac{Total\ IRPJ/C\ SLL}{EBT} \tag{3.1}$$

In Brazil, the nominal rate is 34% (15% of IRPJ, 9% of CSLL, and 10% of additional IRPJ); thus, the interpretation of the GAAP ETR calculation is that if the values are lower than the nominal rate, the company might have engaged in some level of tax aggressiveness. As companies may present negative EBT, IRPJ, and CSLL, ETR is commonly expressed between 0 and 1 (Gupta & Newberry, 1997). Hence, "0" is assigned for ETR when negative and "1" when ETR is above 1. This procedure is done in this study to prevent outliers from distorting the estimate and having to discard them. Another way to assess tax aggressiveness is using the Differential ETR (Hanlon & Heitzman, 2010), whose formula is presented by Equation 3.2.

$$Differential\ ETR\ = NOMINAL\ ETR\ - GAAP\ ETR \tag{3.2}$$

The differential ETR measures the distance between a company's GAAP ETR and its nominal ETR, in this case, 34%. Regarding tax aggressiveness, the Differential ETR is interpreted as meaning that the higher it is, the further away a company's ETR is from its nominal ETR; hence, the greater its aggressive tax planning.

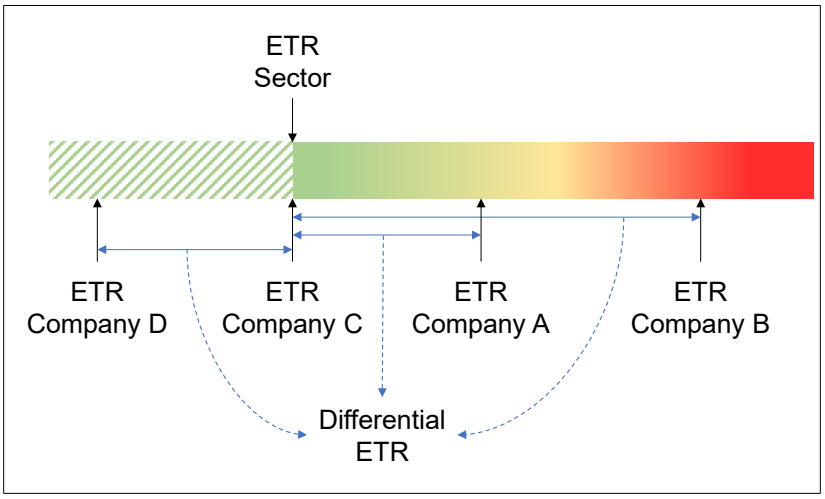
However, we should note that the sectors to which companies are associated in Brazil may present specific characteristics, such as tax incentives or exemptions, which allow adjusting the calculation of their base profit that will be taxed (Santos, Cavalcante & Rodrigues, 2013). Therefore, stating that a company is more aggressive than another in a different sector, based on its ETRs only, is not simple. Thus, the nominal ETR can be replaced by the ETR of the company's sector to incorporate the tax characteristics of that sector (Lopes, 2012).

In this case, the median of the GAAP ETRs for that sector was used to calculate the sector's ETR for the entire universe of B3 companies. The median was chosen because it is less sensitive to outliers. When obtaining the median for the sector's ETR was not possible, as in the case of a sector with companies with all ETRs equal to zero, negative, or both, we adopted the sector's nominal ETR, which is 34%.

Even so, the magnitudes of the absolute values obtained by calculating the Differential ETR may not generate adequate comparisons between companies. For example, the fact that a company presents a Differential ETR of 0.10 may indicate either that the sector's ETR would be 0.32 and the GAAP ETR 0.22 or that the sector's ETR would be 0.25 and the GAAP ETR would be 0.15, i.e., there was a proportionally larger decrease in ETR for the latter (60%) than for the first case (31.25%). Thus, the greater the magnitudes used to calculate the Differential ETR, the less sensitive the result. Therefore, this study adopted the Normalized Differential ETR shown by Equation 3.3.

$$ETR\ Diferencial\ Norm. = 1 - \frac{ETR\ GAAP}{ETR\ Setor} \tag{3.3}$$

Thus, in addition to a company's ETR being normalized with its peers, the calculated value of a company's Normalized Differential ETR is comparable to that of companies in different sectors, considering that the distances are now measured in relative rather than absolute values. The interpretation of the results remains the same as for the Differential ETR; the further away a company's ETR is from its sector's ETR, the more aggressive it is from a tax perspective. Figure 2 illustrates this concept.



Source: developed by the authors (2022).

Figure 2. Interpretation of Differential ETR

Some observations regarding the values obtained in the calculation of the Normalized Differential ETR are presented in Figure 3.

Differential ETR	Interpretation	Value used
Normalized Differential ETR > 0	It indicates a positive distance between the company's ETR and its sector's ETR. In this case, the company may be engaged in some level of tax aggressiveness.	Normalized Differential ETR
Normalized Differential ETR = 0	It indicates no gap between the company's ETR and that of its sector. In this case, the company is not involved in tax aggression.	0
Normalized Differential ETR < 0	It indicates that the company's ETR is higher than its sector's. In this case, the company has not engaged in tax aggression, regardless of the magnitude of this difference.	0

Source: developed by the authors (2022).

Figure 3. Interpretation of Differential ETRs

The control variables are arranged according to the literature, and some of the main determinants of tax aggressiveness have been selected. Thus, the variables include company size (TAM) (Zimmerman, 1983), leverage (ALV) (Dyreng, Hanlon & Maydew, 2010; Kraft, 2014), intangibility (INTG) (Liu & Cao, 2007; Chen et al., 2010), capital intensity (INTCAP) (Chen et al. 2010), inventory intensity (INTINV) (Gupta & Newberry, 1997; Richardson & Lanis, 2007), financial performance (ROA) (Richardson & Lanis, 2007; Armstrong, Blouin & Larcker, 2012), and the presence or absence of tax loss in the previous year (PF) (França & Monte, 2020). Figure 4 describes the variables adopted here.

Variable	Description	Type	Proxy
ETR_Diff_Norm	Normalized Differential ETR	Dependent	ETR Diff. Norm. = 1 – ETR GAAP / ETR Sector.
CR	Corporate Reputation	Independent	Binary variable, "1" is assigned if the firm i in time t is listed on the M&M ranking, and "0" otherwise
CSR	ESG Score	Moderating	ESG Score from Refinitiv Eikon©, ranging from 0.00 and 100.00.
TAM	Size	Control	*Total Asset Log*
ALV	Leverage		Total debts / Total assets
ITNG	Intangibility		Intangible assets / Total assets
INTCAP	Capital Intensity		Fixed assets / Total assets
INTINV	Inventory Intensity		Inventory / Total assets
ROA	Financial Performance		EBT / Total assets
PF	Tax Loss		*Dummy, "1" is assigned if the company presented negative EBT in the previous year, and "0" otherwise.*

Source: Developed by the author (2022)

Figure 4. Variables Description

The data for calculating the control variables were collected from the companies' financial statements, such as Balance Sheets, Income Statements, and Cash Flow Statements extracted from the Refinitiv Eikon® database.

3.4 Econometric models

Since the sample includes different companies that vary over time, the estimation for the Normalized Differential ETR was obtained through a panel data regression. Additionally, panel data modeling allows for controlling individual heterogeneity. For better visualization, all econometric models used in this study are presented in Figure 5:

1st Econometric Model
$ETR\_Diff\_Norm_{i,t} = \beta_0 + \beta_1 RSCi,t + \beta_2 TAM_{i,t} + \beta_3 ALAV_{i,t} + \beta_4 ITNG_{i,t} + \beta_5 INTCAP_{i,t} + \beta_6 INTINV_{i,t} + \beta_7 ROA_{i,t} + \beta_8 PF_{i,t} + \beta_{11} SETOR_{i,t} + \beta 12 ANO_{i,t} + \mu_{i,t}$
2nd Econometric Model
$ETR\_Diff\_Norm_{i,t} = \beta_0 + \beta_1 RC_{i,t} + \beta_2 TAM_{i,t} + \beta_3 ALAV_{i,t} + \beta_4 ITNG_{i,t} + \beta_5 INTCAP_{i,t} + \beta_6 INTINV_{i,t} + \beta_7 ROA_{i,t} + \beta_8 PF_{i,t} + \beta_{11} SETOR_{i,t} + \beta_{12} ANO_{i,t} + \mu_{i,t}$
3rd Econometric Model
$ETR\_Diff\_Norm_{i,t} = \beta_0 + \beta_1 RSC_{i,t} + \beta_2 RC + \beta_3 RSC_{i,t} * RC_{i,t} + \beta_4 TAM_{i,t} + \beta_5 ALAV_{i,t} + \beta_6 ITNG_{i,t} + \beta_7 INTCAP_{i,t} + \beta_8 INTINV_{i,t} + \beta_9 ROA_{i,t} + \beta_{10} PF_{i,t} + \mu_{i,t}$

Source: developed by the authors (2022).

Figure 5. Econometric models

Where *i* and *t* represent the company and year for each variable, respectively. Three regressions were estimated; the first two models tested the relationship between CSR and tax aggressiveness and corporate reputation with tax aggressiveness. Although studies have investigated this relationship, verifying how this behavior occurs in this study sample and whether it corroborates or contradicts the literature is relevant. Finally, the 3rd econometric model directly tests this study's research hypothesis.

4. Analysis and Discussion of Results

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the variables used in the models for the sample of 106 companies from 2010 to 2021, totaling 1,272 observations. The mean distance between the companies' ETR and the sector's ETR was 0.105, with a standard deviation equal to 0.234. This finding shows that the companies in the sample may have engaged in some level of tax aggressiveness.

Table 2
Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Normalized Differential ETR Normalized Differential	1272	0.105	0.234	0	0.988
Corporate Reputation	1272	0.320	0.467	0	1
CSR	1272	31.765	28.879	0	90.030
Size	1272	21.883	5.395	0	27.618
Leverage	1272	0.320	0.207	0	1.928
Intangibility	1272	0.088	0.157	0	0.856
Capital Intensity	1272	0.222	0.209	-0.398	0.837
Inventory Intensity	1272	0.075	0.091	0	0.601
Financial Performance	1272	0.049	0.136	-1.419	2.232
Tax Loss	1272	154.874	361.927	0	1000

Source: developed by the authors (2022).

Regarding the variables of interest, CR and CSR, Table 3 presents the descriptive statistics, considering the variations of a given company in a given period compared to all the companies that remain in the sample throughout the study period (overall variation), the variations of a company compared to the others in the same period (between variation), and variations within the same company over time (within variation).

Table 3
Descriptive statistics of CR and CSR considering overall, between, and within variances.

	Variable	Mean	Stand. Error	Min.	Max.	Observations
rc	*overall*	0.320	0.467	0	1	N = 1.272
	between		0.395	0	1	n = 106
	within		0.252	-0.597	1.236	T = 12
CSR	*overall*	31.765	28.879	0	90.030	N = 1.272
	between		24.779	0.5565	84.294	n = 106
	within		15.012	-41.459	96.467	T = 12

Source: developed by the authors (2024).

Note that there is a greater variation between companies and over time (overall) for both variables, suggesting that estimating the model using panel data considering random effects may be the most appropriate.

4.2 Regression Analysis

The Chow, Breusch-Pagan, and Hausman tests were performed to identify the most appropriate model. For better workflow, the results of these tests are presented in the appendix. Both the Chow, Breusch-Pagan, and Hausman tests indicated the estimation of panel data by fixed effects as being the most appropriate for the 1st model. This estimation aims to capture the variation of individuals over time. Table 4 shows the regression results for the 1st model.

Table 4

Results of the Regression between Normalized Differential ETR and Corporate Social Responsibility

ETR_DIFF_NORM	Coef.	Stand. Error	t-value	p-value	[95%CI]		Sig
CSR	0.001	0.001	0.94	0.346	0.001	0.001	
Size	**0.006**	0.002	3.25	**0.001**	0.002	0.010	***
Leverage	0.012	0.052	0.23	0.818	-0.009	0.114	
Intangibility	-0.040	0.070	-0.58	0.564	-0.177	0.097	
Capital Intensity	-0.063	0.070	-0.91	0.364	-0.200	0.074	
Inventory Intensity	**-0.261**	0.158	-1.65	**0.098**	-0.571	0.049	*
Financial Performance	**0.265**	0.049	5.44	**0.001**	0.169	0.361	***
Tax Loss	0.001	0.001	-2.91	**0.004**	0.001	0.001	***
Constant	-0.016	0.031	-0.50	0.620	-0.077	0.046	
Mean dependent variable		0.1047		SD dependent variable			0.2335
R-squared		0.0814		Number of observations			1272
F-test		79.8958		Prob > F			0.0000
Akaike crit. (AIC)		0.0515		Bayesian crit. (BIC)			0.1397

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

Model: $ETR\_Diff\_Norm_{i,t} = \beta_0 + \beta_1 RSC_{i,t} + \beta_2 TAM_{i,t} + \beta_3 ALAV_{i,t} + \beta_4 ITNG_{i,t} + \beta_5 INTCAP_{i,t} + \beta_6 INTINV_{i,t} + \beta_7 ROA_{i,t} + \beta_8 PF_{i,t} + \beta_{-11} SETOR_{i,t} + \beta_{12} ANO_{i,t} + \mu_{i,t}$

Source: Refinitv Eikon® (2022).

Although the model is statistically significant, the variable of interest (CSR) is not. Therefore, it is impossible to assess the tax aggressiveness behavior of companies with an ESG score. On the other hand, some control variables, such as size, inventory intensity, financial performance, and tax loss, were statistically significant.

The 2nd model's most appropriate regression was panel data considering random effects. Table 5 shows the results of the 2nd model.

Table 5

Results of the Regression between Normalized Differential ETR and Corporate Reputation

ETR_DIFF_NORM	Coef.	Stand. Error	t-value	p-value	[95%CI]		Sig
CR	**-0.036**	0.018	-2.01	**0.045**	-0.072	-0.001	**
Size	**0.008**	0.002	4.66	**0.001**	0.004	0.011	***
Leverage	-0.041	0.045	-0.91	0.361	-0.129	0.047	
Intangibility	-0.085	0.057	-1.50	0.133	-0.196	0.026	
Capital Intensity	**-0.101**	0.050	-2.02	**0.044**	-0.199	-0.003	**
Inventory Intensity	**-0.203**	0.101	-1.84	**0.066**	-0.419	0.013	*
Financial Performance	**0.249**	0.048	5.20	**0.001**	0.155	0.343	***
Tax Loss	**0.001**	0.001	-2.62	**0.009**	0.001	0.001	***
Constant	0.003	0.031	0.09	0.932	-0.057	0.062	
Mean dependent variable		0.105		SD dependent variable		0.234	
Overall r-squared		0.081		Number of observations		1272	
Chi-square		79.896		Prob > chi2		0.000	
R-squared within		0.052		R-squared between		0.140	

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

Model: $ETR\_Diff\_Norm_{i,t} = \beta_0 + \beta_1 RC_{i,t} + \beta_2 TAM_{i,t} + \beta_3 ALAV_{i,t} + \beta_4 ITNG_{i,t} + \beta_5 INTCAP_{i,t} + \beta_6 INTINV_{i,t} + \beta_7 ROA_{i,t} + \beta_8 PF_{i,t} + \beta_{11} SETOR_{i,t} + \beta_{12} ANO_{i,t} + \mu_{i,t}$

Source: Refinitiv Eikon® and Revista Exame Yearbook (2022).

The variable of interest (CR) presented a coefficient of -0.036 and statistical significance, indicating that the Normalized Differential ETR for reputable companies is smaller, consequently indicating lower tax aggressiveness levels.

This result contrasts with the findings of Bai *et al.* (2017), in which higher levels of tax aggressiveness were found among more reputable companies. This study's results also contradict the results by Dhaliwal *et al.* (2022), which indicate that companies express themselves less aggressively only when facing protests and unfavorable media sentiment, showing that corporate reputation may be considered only in specific cases.

Thus, corporate reputation negatively affects the tax aggressiveness of the Brazilian companies in the sample. Finally, the most efficient estimation to verify the study hypothesis was performed through panel data regression by fixed effects. Table 6 shows the regression result for the 3rd model:

Table 6

Results of the Regression between Normalized Differential ETR and the interaction between Corporate Reputation and CSR

ETR_DIFF_NORM	Coef.	Stand. Error	t-value	p-value	[95%CI]		Sig
CR	**-0.062**	0.034	-1.82	**0.069**	-0.129	0.005	*
CSR	0.001	0.001	-0.06	0.953	-0.001	0.001	
CR * CSR	**0.001**	0.001	2.00	**0.046**	0.001	0.002	**
Size	**0.007**	0.002	3.42	**0.001**	0.003	0.011	***
Leverage	0.013	0.052	0.25	0.805	-0.089	0.115	
Intangibility	-0.027	0.070	-0.38	0.701	-0.164	0.111	
Capital Intensity	-0.064	0.007	-0.92	0.357	-0.201	0.073	
Inventory Intensity	-0.251	0.158	-1.59	0.113	-0.560	0.059	
Financial Performance	**0.267**	0.049	5.49	**0.001**	0.172	0.363	***
Tax Loss	**0.001**	0.001	-2.90	**0.004**	0.001	0.001	***
Constant	-0.015	0.031	-0.47	0.639	-0.077	0.047	
Mean dependent variable		0.10467		SD dependent variable		0.23353	
Overall r-squared		0.08801		Number of observations		1272	
Chi-square		95.58837		Prob > chi2		0.00000	
R-squared within		0.05382		R-squared between		0.15503	

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

Model: $ETR\_Diff\_Norm_{i,t} = \beta_0 + \beta_1 RSC_{i,t} + \beta_2 RC + \beta_3 RSC_{i,t} * C_{i,t} + \beta_4 TAM_{i,t} + \beta_5 ALAV_{i,t} + \beta_6 ITNG_{i,t} + \beta_7 INTCAP_{i,t} + \beta_8 INTINV_{i,t} + \beta_9 ROA_{i,t} + \beta_{10} PF_{i,t} + \mu_{i,t}$

Source: Refinitiv Eikon® and Revista Exame Yearbook (2022).

The interaction between the CR and CSR variables was statistically significant with a coefficient of 0.001; hence, the interaction between the companies' corporate reputation and the ESG score affects tax aggressiveness. Table 7 presents the marginal effect of this interaction.

Table 7

Marginal effect of the moderating role between Corporate Reputation and Corporate Social Responsibility

	dy/dx	Stand. Error	z	P>z		
CSR						
1._at: RC = 0	**-0.000**	0.000	-0.060	**0.953**	-0.001	0.001
2._at: RC = 1	**0.001**	0.001	2.160	**0.031**	0.000	0.002

Source: Refinitv Eikon® (2022).

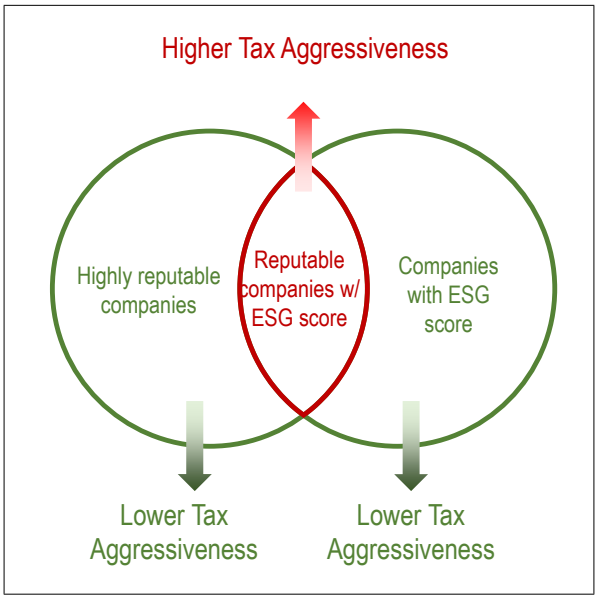
Note that no impact on tax aggressiveness was found among companies with an ESG score only. However, an increase in the distance of the company's ETR from that of its sector was found when the company was highly reputable and presented an ESG score, although the coefficient found was very low (0.001).

4.3 Discussion of Results

Figure 6 shows a summary of the results. The 1st model concerning CSR showed no statistical significance. Statistically significant results were found only in the econometric model testing the effect of corporate reputation on tax aggressiveness, as well as its moderating role, i.e., the 2nd and 3rd models presented analyzable results.

The results from the 2nd model indicate a negative relationship between corporate reputation and tax aggressiveness, indicating fewer signs of aggressive tax planning among highly reputable companies.

Thus, these findings contribute to the literature and complement studies stating that companies with higher corporate reputation are less tax aggressive (Graham *et al.*, 2014; Santos & França, 2022). Such results contradict studies indicating that highly reputable companies are more tax-aggressive (Bai *et al.*, 2017) or even that organizations behave less aggressively at specific times only, as shown by Dhaliwal *et al.* (2022), in which entities shaped their behavior to deal with unfavorable media sentiment.



Source: developed by the authors (2024)

Figure 6. Marginal effect of the CR and CSR moderating role

Significance was found for the control variables size, capital intensity, inventory intensity, financial performance, and tax loss. Size showed a positive relationship with the Normalized Differential ETR, meaning larger companies more frequently engage in tax-aggressive practices. According to Delgado, Fernandez-Rodriguez, and Martinez-Arias (2012), larger companies more frequently perform tax planning and, therefore, can reduce their tax burden. Such a result contradicts the government control hypothesis, which predicts that larger companies are less tax-aggressive due to stricter government control over their taxes (Santos, Cavalcante & Rodrigues, 2013). Therefore, according to Delgado, Fernandez-Rodriguez, and Martinez-Arias (2012), the effect of tax planning is more significant than government control.

Capital and inventory intensity were significant and negatively correlated with tax aggressiveness. Although companies can deduct their income for the year through fixed assets and inventory, the negative relationship found here suggests that this strategy has not been considered by the companies in the sample, which would not aim to reduce their tax burden based on the acquisition of fixed assets or inventory.

Regarding financial performance, greater aggressiveness was found for the best-performing companies. According to França and Monte (2020), this lower taxation can be explained by greater efficiency in resource application. The tax loss variable showed statistical significance and a positive relationship with tax aggressiveness. This finding indicates that companies use their historical losses as a deductible from the calculation basis for taxes on profits, thus presenting lower ETRs and greater tax aggressiveness.

Analysis of the research hypothesis shows reversed results. These results are connected to the studies by Bai *et al*. (2017) and França and Monte (2020), as these authors found that reputation negatively influences tax aggressiveness. However, in this study, reputation interacts with CSR and exerts such influence; therefore, greater tax aggressiveness is found for the Brazilian companies in the sample of highly reputable corporates with high CSR levels.

This finding suggests that these companies could act according to the Moral Licensing Theory, considering that corporate reputation and high corporate social responsibility would grant them moral credits, leading to higher levels of aggressive tax planning. The control variables, size, financial performance, and the dummy for previous periods' tax loss were significant.

The relationship remains the same for size, suggesting that government control over larger companies would not effectively restrict them, enabling these companies to continue engaging in aggressive tax planning practices (Delgado, Fernandez-Rodriguez & Martinez-Arias, 2012). Financial performance also presented the same result as the one found in the previous regression and was positively related to tax aggressiveness. The dummy for tax loss from previous periods was also significant, though its influence on the model was minimal, close to zero (-0.001).

5. Final Considerations

This study achieved its objective by analyzing the influence of corporate reputation as a moderating factor of corporate social responsibility on the tax aggressiveness of companies on the Brazilian Stock Exchange. Complementary analyses were performed to contribute to the subject studied here and verify the individual effect of CR and CSR on tax aggressiveness. Hence, three models were performed: the 1st model assessed the relationship between CSR and tax aggressiveness; the 2nd model assessed the relationship between CR and tax aggressiveness; and the 3rd model assessed the moderating role of CR on the effect of CSR on tax aggressiveness. The 3rd model tested the research hypothesis, presented as follows: corporate reputation positively moderates the effect of corporate social responsibility on the tax aggressiveness of companies on the Brazilian Stock Exchange.

The result of the 1st model was statistically significant, but not for the variable of interest, CSR. Regarding the 2nd model, this study's findings contradict some studies, such as those by Bai *et al.* (2017) and Dhaliwal *et al.* (2022), who found that highly reputable companies would adopt more aggressive tax strategies. As for the result obtained with the analysis of the moderating effect, this was associated with the Moral Licensing Theory since high CSR and corporate reputation represent the achievement of moral credits resulting from the companies' past good deeds, which would grant them moral license to adopt tax aggressiveness practices in the present. Thus, the research problem was answered, and the potential motivations for this result were analyzed.

Concerning the control variables, size, financial performance, and tax loss remained significant in the regressions and always positively related to tax aggressiveness. Capital and inventory intensity suggest that the greater the acquisition of fixed assets and inventory, the lower the tax aggressiveness levels. Therefore, the companies in the sample would not be taking these aspects as part of their tax minimization strategy.

The proxy for tax aggressiveness used here was the Normalized Differential ETR, which brings a differential to this study, as it uses a measure that incorporates both the tax issues of each sector and the normalization of the calculation so that the effective rates of companies in different sectors can be compared.

Future studies are recommended to adopt other metrics of corporate reputation and tax aggressiveness and other econometric models to confirm these findings in the Brazilian context. Likewise, investigating other phenomena that may mediate or moderate the relationship between corporate social responsibility and tax aggressiveness is also relevant.

References

Armstrong, C. S., Blouin, J. L., & Larcker, D. F. (2012). The incentives for tax planning. *Journal of Accounting and Economics*, *53*(1–2), 391–411. https://doi.org/10.1016/j.jacceco.2011.04.001

Bai, Y., Lobo, G. J., & Zhao, Y. (2017). *Reputation and Corporate Tax Planning : A Moral Licensing View Prepared for the 2017 Lone Star Accounting Research Conference*.

Buss, D. M. (2009). How Can Evolutionary Psychology Successfully Explain Personality and Individual Differences? *Perspectives on Psychological Science*, *4*(4), 359–366. https://doi.org/10.1111/j.1745-6924.2009.01138.x

Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Business Horizons*, *34*(4), 39–48. https://doi.org/10.1016/0007-6813(91)90005-G

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. https://doi.org/10.1016/j.jfineco.2009.02.003

Delgado, F. J., Fernández-Rodríguez, E., & Martínez-Arias, A. (2012). Size and other determinants of corporate effective tax rates in US listed companies. *International Research Journal of Finance and Economics*, 160–165.

Dhaliwal, D. S., Goodman, T. H., Hoffman, P. J., & Schwab, C. M. (2022). The Incidence, Valuation, and Management of Tax-Related Reputational Costs: Evidence from Negative Media Attention During Periods Characterized by High Scrutiny of Corporate Tax Avoidance. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2760366

Dyreng, S., Hanlon, M., & Maydew, E. L. (2010). The Effects of Executives on Corporate Tax Avoidance. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1158060

Fombrun, C. (2007). List of Lists: A Compilation of International Corporate Reputation Ratings. *Corporate Reputation Review*, *10*, 144–153. https://doi.org/10.1057/palgrave.crr.1550047

Fombrun, C., & Shanley, M. (1990). What's in a Name? Reputation Building and Corporate Strategy. *Academy of Management Journal*, *33*, 233–258. https://doi.org/10.2307/256324

França, R. D. de, & Monte, P. A. do. (2020). Efeitos Da Reputação Corporativa Na Tax Avoidance De Empresas Brasileiras De Capital Aberto. *Revista Universo Contábil*, *15*(4), 109. https://doi.org/10.4270/ruc.2019430

Gallemore, J., Maydew, E. L., & Thornock, J. R. (2014). The Reputational Costs of Tax Avoidance. *Contemporary Accounting Research*, *31*(4), 1103–1133. https://doi.org/10.1111/1911-3846.12055

Graham, J. R., Hanlon, M., Shevlin, T., & Shroff, N. (2014). Incentives for Tax Planning and Avoidance: Evidence from the Field. *The Accounting Review*, *89*(3), 991–1023. https://doi.org/10.2308/accr-50678

Gupta, S., & Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. *Journal of Accounting and Public Policy*, *16*(1), 1–34. https://econpapers.repec.org/RePEc:eee:jappol:v:16:y:1997:i:1:p:1-34

Guzavicius, A., Vilkė, R., & Barkauskas, V. (2014). Behavioural Finance: Corporate Social Responsibility Approach. *Procedia - Social and Behavioral Sciences*, *156*(April), 518–523. https://doi.org/10.1016/j.sbspro.2014.11.232

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

Huseynov, F., & Klamm, B. K. (2012). Tax avoidance, tax management and corporate social responsibility. *Journal of Corporate Finance*, *18*(4), 804–827. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2012.06.005

Khawaja, M. J., & Alharbi, Z. N. (2021). Factors influencing investor behavior: an empirical study of Saudi Stock Market. *International Journal of Social Economics*, *48*(4), 587–601. https://doi.org/10.1108/IJSE-07-2020-0496

Kraft, A. (2014). What Really Affects German Firms' Effective Tax Rate? *International Journal of Financial Research*, *5*(3). https://doi.org/10.5430/ijfr.v5n3p1

Laguir, I., Staglianò, R., & Elbaz, J. (2015). Does corporate social responsibility affect corporate tax aggressiveness? *Journal of Cleaner Production*, *107*, 662–675. https://doi.org/10.1016/j.jclepro.2015.05.059

Lanis, R., & Richardson, G. (2012). Corporate social responsibility and tax aggressiveness: An empirical analysis. *Journal of Accounting and Public Policy*, *31*(1), 86–108. https://doi.org/10.1016/j.jaccpubpol.2011.10.006

Lei n. 10.406, 10 de janeiro de 2002. Institui o Código Civil. Recuperado de https://www.planalto.gov.br/ccivil_03/leis/2002/l10406compilada.htm

Liu, X., & Cao, S. (2007). Determinants of Corporate Effective Tax Rates: Evidence from Listed Companies in China. *The Chinese Economy*, *40*(6), 49–67. https://doi.org/10.2753/CES1097-1475400603

Lopes, T. (2012). *Custos políticos tributários: o impacto do tamanho na alíquota tributária efetiva* (Vol. 3, Issue September) [Universidade de São Paulo]. https://doi.org/10.11606/T.12.2012.tde-06022013-190650

Mamede de Andrade, E. A., Rodrigues, L. L., & Cosenza, J. P. (2020). Corporate Behavior: An Exploratory Study of the Brazilian Tax Management from a Corporate Social Responsibility Perspective. *Sustainability*, *12*(11), 4404. https://doi.org/10.3390/su12114404

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

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 Contábil*, *19*, 1–19. https://doi.org/10.16930/2237-766220203019

Merritt, A. C., Effron, D. A., & Monin, B. (2010). Moral Self-Licensing: When Being Good Frees Us to Be Bad. *Social and Personality Psychology Compass*, *4*, 344–357.

Montenegro, T. M. (2021). Tax Evasion, Corporate Social Responsibility and National Governance: A Country-Level Study. *Sustainability*, *13*(20). https://doi.org/10.3390/su132011166

Richardson, G., & Lanis, R. (2007). Determinants of the variability in corporate effective tax rates and tax reform: Evidence from Australia. *Journal of Accounting and Public Policy*, *26*(6), 689–704. https://econpapers.repec.org/RePEc:eee:jappol:v:26:y:2007:i:6:p:689-704

Santos, I. A. B., & França, R. D. (2022). Análisis de las relaciones entre reputación corporativa y tax avoidance de empresas brasileñas. *Contabilidad y Negocios*, *17*(34), 117–141. https://doi.org/10.18800/contabilidad.202202.005

Santos, M. A. C. dos. (2016). *Evasão tributária, probabilidade de detecção e escolhas contábeis : um estudo à luz da teoria de agência* [Universidade de Brasília]. https://doi.org/10.26512/2016.05.T.21537

Santos, M. A. C. dos, Cavalcante, P. R. N., & Rodrigues, R. N. (2013). Tamanho da firma e outros determinantes da tributação efetiva sobre o lucro no Brasil. *Advances in Scientific and Applied Accounting*, 179–210. https://doi.org/10.14392/ASAA.2013060204

Thomson Reuters ESG Scores (2017). Thomson-Reuters Eikon. Retrieved from http://www.esade.edu/itemsweb/biblioteca/bbdd/inbbdd/archivos/Thomson_Reuters_ESG_Scores.pdf

Zimmerman, J. L. (1983). Taxes and firm size. *Journal of Accounting and Economics*, *5*(1), 119–149. https://econpapers.repec.org/RePEc:eee:jaecon:v:5:y:1983:i::p:119-149

Zucolotto, A., Acerbe, L., Marques, V., & Jose Zanoteli, E. (2020). *Ambiente de Crise Econômica e Agressividade Tributária: Uma Análise das Empresas Listadas na [B]³ no Período de 2013-2018*.

Appendix A. Breusch-Pagan and Hausman tests

Table 8

Breusch-Pagan test for the 1st econometric model

	Coef.
Chi-square test	402.100
Prob > chibar2	0.000

Source: Developed by the author (2024)

Table 9

Hausman test for the 1st econometric model

	Coef.
Chi-square test	17.679
P-value	0.014

Source: Developed by the author (2024)).

Table 10

Breusch-Pagan test for the 2nd econometric model

	Coef.
Chi-square test value	405.940
Prob > chibar2	0.000

Source: Developed by the author (2024)

Table 11

Hausman test for the 2nd econometric model

	Coef.
Chi-square test	13.410
P-value	0.063

Source: Developed by the author (2024)

Table 12

Breusch-Pagan test for the 3rd econometric model

	Coef.
Chi-square test	380.940
Prob > chibar2	0.000

Source: Developed by the author (2024)

Table 13

Hausman test for the 3rd econometric model

	Coef.
Chi-square test	17.136
P-value	0.047

Source: Developed by the author (2024)