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CRCMG CONSELHO REGIONAL DE CONTABILIDADE DE MINAS GERAIS

# *ESG AND TAX AGGRESSIVENESS IN COMPANIES IN THE DIFFERENTIATED CORPORATE GOVERNANCE SEGMENTS*

# ESG E AGRESSIVIDADE FISCAL NAS EMPRESAS DOS SEGMENTOS DIFERENCIADOS DE GOVERNANÇA CORPORATIVA

**ABSTRACT**
Many profitable companies have *Effective Tax Rate*s below the legal rate, indicating the application of aggressive tax planning. On the other hand, involvement in environmental, social, and governance (ESG) issues tends to produce higher standards of ethical behavior and compliance with the regulations required of companies, including *compliance* with tax regulations. In this sense, this study aimed to investigate the relationship between ESG performance indicators and tax aggressiveness of Brazilian companies that make up B3's differentiated governance listing segments. The sample comprised 55 companies participating in Level 1, Level 2, and Novo Mercado from 2017 to 2021. The ESG metrics were collected from the Refinitiv® database, and the ETR (*Effective Tax Rate*) and ETR_DVA rate were considered as metrics of tax aggressiveness, the latter calculated based on the tax values reported in the Statement of Value Added (DVA). Regressions were performed with panel data, and the results confirmed the research hypothesis that ESG practices reduce the tax aggressiveness of companies based on the relationship between total ESG performance and ETR. However, a significant influence of ESG performance on tax aggressiveness cannot be inferred from the ETR_DVA metric, except for the environmental dimension of ESG. Additionally, considering the ESG governance dimension, there is no evidence that higher scores in the governance pillar influence tax aggressiveness practices.

**Keywords:** Tax aggressiveness. ESG. Corporate Governance.

***RESUMO***
Muitas empresas lucrativas apresentam taxas efetivas de tributos abaixo da taxa legal, indicando a aplicação de planejamentos tributários agressivos. Por outro lado, o envolvimento em questões ambientais, sociais e de governança (ESG) tende a produzir padrões mais elevados de comportamento ético e de *compliance* com os regulamentos exigidos para as empresas, incluindo o atendimento aos regulamentos tributários. Neste sentido, este estudo teve por objetivo investigar a relação entre os indicadores de desempenho ESG e a agressividade fiscal das empresas brasileiras que compõem os segmentos de listagem diferenciados de governança da B3. A amostra foi de 55 empresas participantes do Nível 1, Nível 2 e Novo Mercado, para os períodos de 2017 a 2021. As métricas para ESG foram coletadas na base de dados da Refinitiv® e foram consideradas como métricas de agressividade fiscal a taxa ETR (*Effective Tax Rate*) e a ETR_DVA, essa última calculada com base nos valores dos tributos informados na Demonstração do Valor Adicionado (DVA). Foram realizadas regressões com dados em painel, e os resultados confirmaram a hipótese da pesquisa de que as práticas ESG reduzem a agressividade fiscal das empresas, com base na relação entre o desempenho ESG total e a ETR. No entanto, não se pode inferir influência significativa do desempenho ESG sobre a agressividade fiscal pela métrica ETR_DVA, exceto pela dimensão ambiental de ESG. Adicionalmente, considerando a dimensão governança de ESG, não se encontra evidência de que maiores *scores* do pilar de governança influenciem as práticas de agressividade fiscal.

***Palavras-chave***: Agressividade fiscal. ESG. Governança Corporativa.

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## 1. INTRODUCTION

In the literature, the practice of tax planning can also be called tax aggressiveness, tax avoidance, and tax management, which is one of how the phenomenon in which companies try to reduce their taxes is known, taking advantage of legal concessions and exemptions that result in lower tax obligations (Martinez, 2017). The degree of tax aggressiveness is verified by the intensity and legality of tax reduction activities, which vary from perfectly legal to clearly illegal (Liets, 2013).

The impact of ESG issues, being E (environmental), S (social), and G (governance), on the tax aggressiveness of companies is increasingly discussed in research involving taxes (Hohn *et al*., 2021; Kovermann & Velte, 2021; Melo *et al*., 2020). Despite all the progress of research in this area, many contributions can be made to improve the understanding of how taxes impact corporate decisions, following changes in tax rules, and informing society about the behavior of companies, their real effects, and their macroeconomic implications (Hanlon & Heitzman, 2010).

The concern with the ESG issue is contained in the term Corporate Social Responsibility (CSR), which is often used as a synonym for corporate sustainability, corporate responsibility, and business ethics (Melo *et al*., 2020). The government's collection of taxes should contribute to meeting society's demands (Freitas *et al*., 2019). Therefore, Corporate Social Responsibility seeks to maximize results linked to a responsible attitude towards society (Hohn *et al*., 2021).

In this context, it is expected that companies committed to ESG practices bear their fiscal responsibilities and act with less tax aggressiveness (Lanis & Richardson, 2011). Martinez and Ramalho (2017) studied the Brazilian companies that make up the portfolio of the B3 Corporate Sustainability Index (ISE B3) and showed that companies that engage with sustainability tend to be less aggressive, avoiding tax risks and, therefore, less subject to tax liabilities.

The literature points to conflicting results for the relationship between tax aggressiveness and ESG performance indicators. In the literature review carried out internationally by Kovermann and Velte (2021), they observed that there is no stable association between ESG performance measured by ESG scores and a company's tax practices, indicating that companies with high ESG performance are often also aggressive in their tax planning.

On the other hand, Hohn *et al*. (2021) researched the joint effect of corporate governance and responsible behavior on the tax aggressiveness of Brazilian companies and concluded that the higher the level of corporate governance, the lower the level of tax aggressiveness; however, in the relationship between CSR and tax aggressiveness, the more socially responsible, the greater the tendency for tax aggressiveness, and finally, companies that have CSR practices and a high level of governance are less tax aggressive.

In this context, the following research problem arises: **What is the relationship between ESG sustainable performance indicators and the tax aggressiveness of Brazilian companies that make up B3's differentiated listing segments?** The objective of the present study is to investigate this relationship.

Previous research in the national environment used as metrics of concern with sustainability the fact of being part of the Corporate Sustainability Index (ISE B3) portfolio or even publishing Corporate Social Responsibility (CSR) statements (Freitas *et al*., 2019; Martinez & Ramalho, 2017). However, to measure the company's engagement with ESG issues, this research intends to use Refinitiv®'s ESG score. The ESG *score* is an overall company score based on self-reported information in the environmental, social, and corporate governance pillars, designed to transparently and objectively assess relative ESG performance, commitment, and effectiveness based on publicly available and auditable data.

The choice to investigate companies in B3's differentiated listing segments is justified by the fact that these companies adopt stricter governance rules that go beyond the obligations that companies have under the Brazilian Corporation Law (Brazil, 1976) and that aim to improve the evaluation of companies that are voluntarily listed in one of these segments (Brasil Bolsa Balcão [B3], 2023).

Additionally, this study is justified by using two metrics of aggressiveness, one of which is exclusively national in scope and the other adopted in Brazil and internationally, allowing the comparison of the results of the ESG relationship and aggressive fiscal planning from different metrics of aggressiveness and thus enriching the scope of studies on tax aggressiveness in Brazil. For emerging scenarios such as Brazil, the information on the amounts allocated to the government expressed in the Value Added Statement (DVA) proves to be an appropriate proxy for the total tax burden since it contains taxes on revenue in addition to taxes on profit (Martinez & Motta, 2020). Another *proxy* used in this study is the ETR (*Effective Tax Rate*), one of the *most used proxies* to indicate tax aggressiveness in the international literature, calculated by the ratio between tax expenses on income and accounting profit before taxes (Hanlon & Heitzman, 2010).

This study seeks to contribute to regulators, investors, and accounting professionals by presenting the tax behavior of companies with ESG practices. The results are expected to influence the improvement of companies' accounting and tax practices.

## 2. LITERATURE REVIEW

### 2.1. Corporate sustainability and ESG

The impact caused by companies on the environment and social well-being has been a growing concern of executives, investors, and society in general (Ferrell *et al*., 2016). According to Gillan *et al*. (2021), corporate actions in these aspects are called environmental, social, and governance (ESG) and Corporate Social Responsibility (CSR). According to the *Gov-*

*ernance & Accountability Institute* (G&A Institute) (2023), other terms are also widely used to describe companies' actions involving ESG, such as Corporate Sustainability, Corporate Citizenship, and ESG Strategies and Performance.

Companies characterized by good corporate governance promote efforts to help protect the environment, seek social equality, and improve community relations while seeking to maximize profits (Ferrell *et al*., 2016; Hohn *et al*., 2021). Society as a whole supports and encourages ESG practices that generate value for companies. Companies with socially responsible behavior establish a reputation that can help attract and retain more productive employees and loyal customers, consequently impacting the cost of capital and cash flow (Gillan *et al*., 2021; Hong & Liskovich, 2015).

Among the factors that can stimulate ESG investments, Borghesi *et al*. (2014) argue that adopting socially responsible behavior in business can help companies mitigate legal, political, and tax risks to the extent that ESG investments reduce the likelihood of being sued and/or regulated. In addition, Silva *et al*. (2022) found that companies that engage in sustainable practices and publish CSR reports improve the quality of the information provided, reduce information discrepancy, and, as a result, increase their market value.

In this sense, most companies take measures to highlight their investments in these activities, disclosing sustainability reports by the guidelines of the company that publishes them or by the standards for the implementation of sustainability reports already established, such as the *Global Reporting Initiative* (GRI) or the Integrated Report (IR) (Barbosa *et al*., 2023; Gillan *et al*., 2021; Kovermann & Velte, 2021). In addition, several organizations and stock exchanges worldwide have created indexes, *rankings*, and recommendations based on the economic, social, and environmental dimensions (Pessoa, 2019).

The increase in the number of investors who have directed financial resources to companies committed to ESG and who demand comparable and verifiable information led to the creation of the International Sustainability Standards Board (ISSB), according to the International Financial Reporting Standards Foundation (IFRS Foundation) (2023), with the aim of providing a global basis for sustainability-related disclosure standards. In Brazil, according to the Federal Accounting Council (CFC) (2023), the Brazilian Committee for Sustainable Pronouncements (CBPS) was created, which is responsible for studying, preparing and issuing technical documents on the disclosure of sustainability practices.

Refinitiv®'s ESG scores are designed to transparently and objectively measure ESG performance, commitment, and effectiveness based on company-reported data. This covers ten main themes, including emissions, product innovation, human rights, shareholders, etc. The methodology applied by Refinitiv® uses *industry benchmarking*, which is an essential factor considering that Borghesi *et al*. (2014) found that some industries, such as consumer goods and computer *hardware*, have above-average scores, and others, such as aircraft, oil, and natural gas, have below-average scores.

### 2.2. ESG and tax aggressiveness

Tax aggressiveness refers to activities favorable to reducing taxes and actions carried out to avoid or reduce the payment of taxes and obtain tax benefits (Hanlon & Heitzman, 2010). Other nomenclatures are used in the literature to refer to tax aggressiveness, such as tax planning, fiscal management, tax management (Gomes, 2012; Martinez, 2017), and tax avoidance (Fisher, 2014; Lietz, 2013).

The means used to avoid or reduce the payment of taxes can be lawful (tax avoidance) or not (tax evasion) (Freitas *et al*., 2019). Reducing taxes using legal means is known as tax avoidance; on the other hand, the use of illicit means is called tax evasion or tax *evasion* (Fisher, 2014). For Lietz (2013), these constructs differ in the degree of legal sustainability that the transactions represent, illustrating tax avoidance as a gray area between tax compliance and tax evasion.

Efficient tax planning needs to consider all parties involved in the process, including all taxes (direct and indirect), and consider explicit and implicit costs, even if uncertain (Scholes *et al*., 1992). Tax planning activities may include taking advantage of legal concessions and exemptions, the installment of taxes, the structuring of the company's operations and corporate reorganizations, involving shareholdings and corporate acts in order to reduce tax obligations to the lowest possible amount (Marinho & Machado, 2023; Martinez, 2017; Proner *et al*., 2021).

Tax aggressiveness can result in tax savings, maximization of profits, increased cash flow, reduction of debt costs, and higher compensation for executives (Mamede Junior *et al*., 2023; Moraes *et al*., 2021; Proner *et al*., 2021; Vello & Martinez, 2014). On the other hand, the costs caused by this practice may include implementation costs, agency costs, reputation costs, and any fines and tax penalties imposed by the tax administration (Lanis & Richardson, 2011; Moraes *et al*., 2021).

Tax aggressiveness increases the complexity of companies' financial transactions, which can result in agency problems caused by a lower level of transparency. (Lanis & Richardson, 2011; Moraes *et al*., 2021). Martinez (2017) points out that implementing activities aimed at tax savings at aggressive levels is subject to questioning by the tax authorities due to the possibility of ambiguity in applying an economic interpretation to tax facts.

Compliance with tax obligations by companies maintains a direct relationship with ESG issues since, through taxes, public goods are made available to society (Fisher, 2014). The literature establishes that when the company adopts ESG practices and the payment of taxes as ways to contribute to society, ESG, and tax aggressiveness result in a negative relationship (Hohn *et al*., 2021; López-González *et al*., 2021; Melo *et al*., 2020). On the other hand, when the two activities exhibit a positive relationship, it is evidence that companies are engaged in ESG practices with the objective of risk management (Mao, 2019; Zeng, 2019).

Melo *et al*. (2020) verified the impact of CSR on the tax aggressiveness of Brazilian publicly traded companies over eight years using variables that measure the performance of CSR in the environmental, social, and governance dimensions and in aggregate and the *Effective Tax Rate* (ETR). Melo *et al*. (2020) observed that, regardless of size, adopting more or better CSR practices results in lower tax aggressiveness for the companies in the sample.

In the study conducted by Du and Li (2023), the relationship between tax aggressiveness and CSR in emerging markets was explored using Refinitiv®'s combined ESG index. It also investigated how engaging in socially responsible practices affects financial performance and constraints on bank debt financing at the company level. The results indicated that tax aggressiveness negatively correlates with ESG performance and that companies that perform highly in CSR tend to have more robust financial performance and lower bank debt costs.

Freitas *et al*. (2019) investigated the relationship between corporate sustainability and tax avoidance using a sample of 93 companies that are part of B3's IBrX 100 in the period from 2015 to 2017, using as *proxies* of ESG practices the integration of the B3 Corporate Sustainability Index (ISE B3) and tax aggressiveness, the DVA Rate, which considers the relationship between the amount of tax paid and the total value added. The results indicated that socially responsible companies tend to have a higher tax rate concerning the value added to be distributed.

According to Hohn *et al*. (2021), corporate governance is based on principles of equity, transparency, and ethics, so companies with corporate governance are more attentive to compliance with laws and consistent accountability. The authors investigated the impact of CSR on the relationship between corporate governance and aggressiveness of publicly-held companies listed on B3. They concluded that companies with good corporate governance practices and responsible behavior tend not to enjoy probable tax benefits.

Others researches investigating the relationship between corporate sustainability, ESG, and tax aggressiveness in companies concluded that companies with strong ESG performance tend to have more aggressive tax behavior. Khan *et al*. (2022) investigated the relationship between corporate governance, tax aggressiveness, and CSR reporting in the emerging markets of Nigeria and Pakistan. They concluded that CSR is positively associated with tax aggressiveness in Nigeria and positive but not significant in the case of Pakistan.

Zeng (2019) examined the relationship between CSR and tax avoidance in companies from 35 countries, using ETR and BTD as aggressiveness metrics. He also observed how CSR and country-level governance affect tax avoidance, finding strong evidence that CSR is positively related to tax avoidance. However, in countries with weak governance, companies with higher CSR scores engage less in tax avoidance.

Thus, the following research hypothesis is established:

**H 1: ESG practices reduce the tax aggressiveness of companies listed in B3's differentiated governance segments.**

Given the above, companies with higher ESG scores are expected to pay their fair share of taxes and thus act with less tax aggressiveness (Lanis & Richardson, 2011). In this context, based on the theoretical framework and supported by the studies already carried out, this article deepens the understanding of the relationship between ESG performance and tax aggressiveness. However, it differs from the others because it intends to investigate this relationship in Brazilian companies in differentiated governance segments of B3, using the Refinitiv® ESG Score and ETR and ETR_DVA as aggressiveness metrics.

## 3. METHODOLOGICAL PROCEDURES

### 3.1. Selection of the population and sample

The survey population comprised 243 publicly traded companies listed in B3's differentiated corporate governance segments, with data collected over five years (2017 to 2021). Financial companies, which have specific characteristics of tax legislation and other operational peculiarities that make it impossible to compare with other sectors, were excluded (Moraes *et al*., 2021).

Additionally, in order to avoid bias in the estimation of the econometric models used, companies that had a negative net worth were eliminated (Degenhart *et al*., 2022; Melo *et al*., 2020), absence of data necessary for the operationalization of the variables established in the study, and companies that did not present ESG scores in the analyzed period (Degenhart *et al*., 2022).

Thus, a sample of 55 companies remained, composing a balanced panel with 275 observations (Freitas *et al*., 2019; Martinez & Ramalho, 2017). Table 1 presents the composition and selection of the research sample.

**Table 1 - Sample composition**

| Sample | Quantity |
|---|---|
| Companies - Refinitiv® database | 243 |
| Exclusions | |
| Financial Sector | -22 |
| Businesses with a lack of data | -164 |
| Companies with negative net worth | -2 |
| Final Number of Companies | 55 |
| Number of periods in years | 5 |
| Number of observations | 275 |

### 3.2 Definition of dependent and independent variables

According to Hanlon and Heitzman (2010), the metrics for tax aggressiveness found in the literature employ estimates of taxable income or payment of taxes on income, which in Brazil correspond to the Corporate Income Tax (IRPJ) and the Social Contribution on Net Income (CSLL), whose combined legal rate is 34%.

The choice of ETR (*Effective Tax Rate*) as a metric for tax aggressiveness in this study is justified by its wide use in national and international tax studies (López-González *et al.*, 2019; Melo *et al.*, 2020). ETR is calculated by the ratio between the expense with IRPJ and CSLL and accounting profit before these taxes (LAIR) (Pessoa, 2019). Thus, according to the literature, it is interpreted that lower ETR values indicate aggressive tax planning, while higher ETR values indicate less tax aggressiveness (Christensen *et al.*, 2022; Xavier *et al.*, 2022).

However, in the face of a tax system that favors consumption taxes, ETR may not represent a fully adequate metric for tax aggressiveness (Martinez, 2017; Xavier *et al.*, 2022). For this reason, in addition to the ETR, this study also uses as a proxy for tax aggressiveness the ETR_DVA, a strictly national metric obtained by the ratio between the DVA tax burden (federal, state and municipal) and the total added value to be distributed.

The ETR_DVA can be considered a metric capable of establishing tax aggressiveness more comprehensively than the ETR, as it includes all taxes and not only taxes on income (Mamede Junior *et al.*, 2023; Martinez, 2017). It is interpreted that low ETR_DVA rates are associated with greater tax aggressiveness (Martinez & Motta, 2020).

Table 2 presents the dependent variables used as a proxy for tax aggressiveness in this study.

**Table 2 - Dependent Variables**

| Variable | Operationalization | References | Source |
|---|---|---|---|
| ETR | Total expenditure of IRPJ and CSLL it /LAIR it | Hanlon e Heitzman (2010); Mamede Junior *et al.* (2023); Marinho e Machado (2023); Martinez (2017). | Refinitiv® |
| ETR_DVA | Tax Burden<br>Total it / Valor Total<br>Added it | Freitas *et. al.* (2019);<br>Mamede Junior et al. (2023); | Pacote GetDFPData Perlin, Kirch e Vancin (2018) |

In this work, we adopted the ESG rating by Refinitiv®, a private company that publishes ESG performance ratings worldwide. The company's disclosures are at the heart of the ESG scoring methodology, where unique materiality weights of each metric are assigned to each sector, industry, and country benchmark.

Refinitiv®'s ESG scoring methodology ranges from 0 to 100% and corresponds to the average of scores in 10 categories: in the environmental aspect, performance in matters related to resource use, greenhouse gas emissions, and innovation are observed; in the social sphere, the average indicates performance in matters related to the community, human rights, employees and product responsibility; finally, in the aspect of governance, performance in matters related to shareholders, risk management and CSR are observed (Refinitiv, 2022).

This study considered each ESG dimension (environmental, social, and governance) as an independent variable while also observing the aggregate impact of the three ESG dimensions. This allows an individualized assessment of each dimension on companies' tax behavior.

Table 3 describes the metrics used in the study as a proxy for ESG and the relationship that the coefficient of each variable is expected to assume with the model-dependent variable.

**Table 3 - Independent Variables**

| Variable | Description | References | Source | Expected Signal |
|---|---|---|---|---|
| ESGT | It indicates the average of the company's performance in the three dimensions of ESG: environmental, social, and governance. | Degenhart *et al.* (2022); Honh *et al.* (2021); Melo *et al.* (2020). | Refinitiv® | ( + ) |
| ESGA | It indicates the average performance of the company in matters related to the use of resources, emissions and innovation. | Degenhart *et al.* (2022); Honh *et al.* (2021); Melo *et al.* (2020). | Refinitiv® | ( + ) |
| ESGS | Indicates the average performance of the company in matters related to employees, community, human rights and product responsibility. | Degenhart *et al.* (2022); Honh *et al.* (2021); Melo *et al.* (2020). | Refinitiv® | ( + ) |
| ESGG | It indicates the average performance of the company in matters related to management, shareholders and Corporate Social Responsibility (CSR). | Degenhart *et al.* (2022); Honh *et al.* (2021); Melo *et al.* (2020). | Refinitiv® | ( + ) |

Understanding that other factors can influence companies' tax aggressiveness in addition to ESG scores, this study included control variables selected from other studies on the relationship between ESG and tax aggressiveness.

Several researchers have used company size (TAM) as an appropriate metric for studies related to tax aggressiveness since larger companies have greater scope for tax planning and adoption of accounting practices favorable to the reduction of ETR (Hohn *et al.*, 2021). Additionally, the variables intangible (INTAN), fixed assets (IMOB), and leverage (LEV) have been present in studies on the subject because these variables allow a reduction in the tax burden through the deductibility of interest, depreciation expenses, and amortization of intangibles (Freitas *et al.*, 2019; Melo *et al.*, 2020). Finally, the variable return on assets (ROA) was used to measure the financial performance of companies and its possible relationship with tax aggressiveness (Mamede Junior *et al.*, 2023; Melo *et al.*, 2020).

Table 4 summarizes the control variables, operationalization, source of data collection, some authors who used the variables, and the expected signs based on the results of previous studies.

**Table 4 - Control variables used and associations expected in the study**

| Variable | Operationalization | Description | Source | Expected Signal |
|---|---|---|---|---|
| Size (TAM) | Natural Logarithm of Total Asset | Freitas et. al. (2019); Hohn *et al.* (2021); Marinho e Machado (2023); Martinez (2017); Melo *et al.* (2020). | Refinitiv® | ( - ) |
| Intangibilidade (INTAN) | Intangible Assets / Total Assets | Freitas *et. al.* (2019); Hohn *et al.* (2021); Martinez, (2017); Melo *et al.* (2020). | Refinitiv® | ( - ) |
| Immobilization (IMOB) | Fixed Assets/ Total Assets | Freitas et. al. (2019); Hohn *et al.* (2021); Martinez (2017); Melo *et al.* (2020). | Refinitiv® | ( - ) |
| Leverage (LEV) | (Current Liabilities + Non-Current Liabilities) / Total Assets | Freitas *et. al.* (2019); Hohn *et al.* (2021); Marinho e Machado (2023); Martinez (2017). | Refinitiv® | ( - ) |
| Return on Assets (ROA) | Net Income/Total Assets | Hohn et al. (2021); Mamede Junior *et al.* (2023); Marinho e Machado (2023); Martinez (2017); Melo *et al.* (2020). | Refinitiv® | ( +/- ) |

### 3.3. Data processing

The variables were analyzed in Excel, and the econometric regressions were generated using the Stata® software, version 14.0. Descriptive statistics, Spearman's correlation, and regression estimation were performed using data in a balanced panel. However, given variables with different levels and to avoid the loss of observations of the sample due to outliers, the data were *winsorized* to the significance level of 5% (Degenhart *et al.*, 2022; Mamede Junior *et al.*, 2023; Mao, 2019). In addition, tests were carried out to verify the model's assumptions regarding data normality, homoscedasticity, and absence of multicollinearity (Fávero & Belfiore, 2022).

First, the *Shapiro-Francia* test was applied to verify whether the models had a normal distribution of the residues. Next, to test the absence of multicollinearity, the Variance Inflation Factor (VIF) test of the explanatory variables was performed at a significance level of 5%; and finally, the Breusch-Pagan test was applied to verify the heteroscedasticity of the data (Fávero & Belfiore, 2022). The result of the tests implied the rejection of null hypotheses (p-values less than 0.05), i.e., the residuals do not follow a normal distribution and present heteroscedasticity problems, which led to a regression estimate with robust standard errors, clustered by the company (Fávero & Belfiore, 2022).

In order to test the relationship between tax aggressiveness, measured by the ETR and ETR_DVA metrics, and ESG scores in a grouped manner and in the individual dimensions, environmental (A), social (S), and governance (G), 8 (eight) different models were estimated, according to the following equations.

$$\mathrm{ETR}_{it} = \beta_0 + \beta_1 \mathrm{ESGT}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (1)$$

$$\mathrm{ETR}_{it} = \beta_0 + \beta_1 \mathrm{ESGA}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (2)$$

$$\mathrm{ETR}_{it} = \beta_0 + \beta_1 \mathrm{ESGS}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (3)$$

$$\mathrm{ETR}_{it} = \beta_0 + \beta_1 \mathrm{ESGG}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (4)$$

$$\mathrm{ETR_DVA}_{it} = \beta_0 + \beta_1 \mathrm{ESGT}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (5)$$

$$\mathrm{ETR_DVA}_{it} = \beta_0 + \beta_1 \mathrm{ESGA}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (6)$$

$$\mathrm{ETR_DVA}_{it} = \beta_0 + \beta_1 \mathrm{ESGS}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (7)$$

$$\mathrm{ETR_DVA}_{it} = \beta_0 + \beta_1 \mathrm{ESGG}_{it} + \beta_2 TAM_{it} + \beta_3 \mathrm{INTAN}_{it} + \beta_4 IMOB_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \varepsilon_{it} \quad (8)$$

Where:
i: corresponds to the company in the sample – from 1 to 55;
T: corresponds to the year under review – from 2017 to 2021.
$\beta_0$: d denotes the intercept of the model;
βn: slope of the nth explanatory variable;
ETR: *Effective Tax Rate*;
ETR_DVA: rate based on the amount of taxes distributed in the DVA;
ESGT: joint ESG dimension Score, considering environmental, social, and governance aspects;
ESGA: environmental dimension of ESG Score;
ESGS: social dimension of ESG Score;
ESGG: ESG corporate governance dimension Score;
SIZE: size;
INTAN: intangibilidade;
IMOB: capital intensity;
LEV: leverage;
ROA: financial performance;
Eit: idiosyncratic error, which varies randomly for all companies and periods.

Following the procedures for determining which panel data model is most suitable for the analyzed sample (*Pooled Ordinary Least Squares*, Fixed or Random Effects), the *Chow, LM, Breusch-Pagan*, and *Hausman tests were performed* (Fávero & Belfiore, 2022).

## 4. ANALYSIS OF THE RESULTS

Table 5 presents the descriptive statistics of the sample.

**Table 5 - Descriptive Statistics**

| Variable | Number of observations | Average | Median | Standard deviation | Minimal | Maximum |
|---|---|---|---|---|---|---|
| ETR | 275 | 0,2210268 | 0,2198280 | 0,2404908 | -0,2318093 | 0,9191524 |
| ETR_DVA | 275 | 0,2774047 | 0,2529694 | 0,1762670 | 0,0061982 | 0,6690070 |
| ESGT | 275 | 55,8093400 | 59,6042600 | 19,0812400 | 16,5118200 | 84,2885300 |
| ESGA | 275 | 52,5003600 | 57,9139800 | 25,9485800 | 1,3089800 | 88,7695300 |
| ESGS | 275 | 57,6768700 | 60,2247500 | 21,7609500 | 12,4182400 | 90,1034700 |
| ESGG | 275 | 57,1410000 | 61,1668300 | 20,0114200 | 17,5146300 | 87,5121500 |
| TAM | 275 | 23,8160400 | 23,8415200 | 1,0230010 | 22,0450200 | 25,9104600 |
| INTAM | 275 | 0,0930701 | 0,0532720 | 0,1173707 | 0,0016364 | 0,4812203 |
| IMOB | 275 | 0,2310365 | 0,1829229 | 0,2024870 | 0,0027098 | 0,6536577 |
| LEV | 275 | 0,6333717 | 0,6551303 | 0,1641906 | 0,3169923 | 0,9150233 |
| ROA | 275 | 0,0476544 | 0,0455392 | 0,0481023 | -0,0425219 | 0,1528230 |

It is observed that the average ETR is 22.10%, a percentage below the tax burden of 34% of Corporate Income Tax (IRPJ) and Social Contribution on Net Income (CSLL), which is an indication of the presence of tax aggressiveness in the companies in the sample. (Xavier *et al*., 2022).

The latest study on the Brazilian tax burden released by the Federal Revenue Service of Brazil (RFB, 2021) shows that Brazil's total tax burden corresponds to about 32.95% of the Gross Domestic Product (GDP). Thus, the average of the ETR_DVA (27.74%), corresponding to a value below the Brazilian tax burden, may indicate tax planning of companies in all taxes since the metric ETR_DVA includes, in addition to taxes on profit, taxes on revenue, which represent the most significant slice of the national tax burden (Mamede Junior *et al*., 2023).

Regarding ESG scores, it is observed that the social dimension has the highest average (57.67%), indicating that social inclusion actions, diversity incentive policies, and practices to promote equity are probably among the leading business actions of Brazilian companies in alignment with ESG guidelines (Pacto Global Rede Brasil & Stilingue, 2021).

When observing the breadth of the ESG variables in their dimensions, it is possible to notice that although the companies in the sample are engaging in ESG-related activities, the minimum scores in the environmental (ESGA = 1.30), social (ESG = 12.41) and governance (ESGG = 17.51) dimensions, indicate that companies have an opportunity and possibility to explore further their involvement with ESG issues (Pacto Global & Stilingue, 2021).

Tables 6 and 7 present the estimates for the eight models used in this study. In all models, the dependent variables represent the level of tax aggressiveness, measured through ETR and ETR_DVA, of Brazilian companies in B3's differentiated corporate governance segments.

**Table 6 - Results of regressions considering different ESG dimensions with ETR**

| Independent variables | Model 1 ESGT | Model 2 ESGA | Model 3 ESGS | Model 4 ESGG |
|---|---|---|---|---|
| ESG | 0,0019628** | 0,0022592*** | 0,001459* | -0,0006754 |
| | (0,0009912) | (0,000744) | (0,0008458) | (0,0008752) |
| TAM | 0,0143067 | 0,0045846 | 0,0181202 | 0,0316767* |
| | (0,0187581) | (0,0186615) | (0,0185196) | (0,0186654) |
| INTAM | 0,3429012** | 0,3400643** | 0,333478** | 0,3284565* |
| | (0,1503384) | (0,1449216) | (0,1564674) | (0,183113) |
| IMOB | -0,1310204 | -0,1324012 | -0,1233601 | -0,0901748 |
| | (0,081874) | (0,084753) | (0,0798007) | (0,0830499) |

| Independent variables | Model 1 ESGT | Model 2 ESGA | Model 3 ESGS | Model 4 ESGG |
|---|---|---|---|---|
| LEV | 0,242564<br>(0,1255441) | 0,0043801<br>(0,1281775) | 0,0264925<br>(0,124127) | 0,0629618<br>(0,1213759) |
| ROA | -0,747905*<br>(0,4085342) | -0,8306166**<br>(0,4007814) | -0,7429357*<br>(0,4098239) | -0,6803021*<br>(0,4105533) |
| Constant | -0,2106103<br>(0,3899307) | -0,0289804<br>(0,397249) | -0,2785854<br>(0,3910226) | -0,5119861<br>(0,3967869) |
| Number of observations | 275 | 275 | 275 | 275 |
| Number of groups | 55 | 55 | 55 | 55 |
| VIF Test | 1,38 | 1,39 | 1,36 | 1,30 |
| Chow Test | p>F=0,0007 | p>F=0,0011 | p>F=0,0010 | p>F=0,0007 |
| *Breusch-Pagan* Test | p>chibar2=0,0010 | p>chibar2=0,0017 | p>chibar2=0,0014 | p>chibar2=0,0009 |
| *Hausman* Test | p>chi2=0,4749 | p>chi2=0,4290 | p>chi2=0,4704 | p>chi2=0,4208 |

Note: The values for the coefficients are presented, and below, in parentheses, are the standard errors. Statistical significance is indicated by *10%, **5%, ***1%.

The results reveal that the Total ESG Score (ESGT) has a positive and significant influence on ETR at the level of 5%, indicating that the higher the ESG score, the higher the ETR, i.e., the lower the tax aggressiveness of companies. This result converges with other studies suggesting that companies with better ESG performance tend to be less aggressive in their tax planning (Du & Li, 2023; Honh *et al*., 2021; Melo *et al*., 2020). On the other hand, Pessoa (2019) examined the relationship between the three dimensions of ESG and ETR and found no significant influence of ESG on tax aggressiveness.

Corroborating the result that indicated a positive relationship between the environmental (ESGA) and social (ESGS) dimensions of ESG with REE, López-González *et al*. (2019) researched the effect of sustainable ESG practices on tax aggressiveness, covering an international sample of 6,442 observations from 2006 to 2014 and concluded that companies with higher ESG performance in the environmental and social aspects have lower tax-saving practices. However, this relationship is lower in family businesses.

A study by Laguir *et al*. (2015) examined the influence of ESG scores in their different dimensions (environmental, social, and governance) on the tax aggressiveness measured by ETR. They found a significant and positive relationship only with the social dimension of ESG, concluding that a company's tax aggressiveness depends on the nature of the ESG activities it develops.

**Table 7 - Results of regressions considering different ESG dimensions with ETR-DVA**

| Independent Variables | Model 5 ESGT | Model 6 ESGA | Model 7 ESGS | Model 8 ESGG |
|---|---|---|---|---|
| ESG | -0,0002647 | 0,0010457** | -0,0003795 | -0,0009369 |
| | (0,0007251) | (0,0004161) | (0,0004494) | (0,0006352) |
| TAM | 0,0194015 | 0,011485 | 0,0202079 | 0,0332706** |
| | (0,0213823) | (0,0158963) | (0,0212772) | (0,0163473) |
| INTAM | 0,3085112 | 0,3819869*** | 0,3134563 | 0,3364461*** |
| | (0,1961709) | (0,1380405) | (0,2009445) | (0,1291579) |
| IMOB | 0,1169487 | -0,0010732 | 0,1181665 | 0,0033269 |
| | (0,1049562) | (0,0689896) | (0,1035462) | (0,0673139) |

| Independent Variables | Model 5 ESGT | Model 6 ESGA | Model 7 ESGS | Model 8 ESGG |
|---|---|---|---|---|
| LEV | -0,273481** | -0,186222* | -0,2676728** | -0,1785617* |
| | (0,1257638) | (0,1095047) | (0,1245152) | (0,1045664) |
| ROA | -0,1735515 | -0,1657305 | -0,1790591 | -0,1371335 |
| | (0,1170096) | (0,1112263) | (0,1172572) | (0,1071102) |
| Constant | -0,0441353 | 0,395174 | -0,0603852 | -0,3738811 |
| | (0,4579292) | (0,346225) | (0,4637684) | (0,3405937) |
| Number of Observations | 275 | 275 | 275 | 275 |
| Number of Groups | 55 | 55 | 55 | 55 |
| VIF Test | 1,38 | 1,39 | 1,36 | 1,3 |
| Chow Test | p>F=0,0000 | p>F=0,0000 | p>F=0,0000 | p>F=0,0000 |
| *Breusch-Pagan* Test | p>chibar2=0,0000 | p>chibar2=0,0000 | p>chibar2=0,0000 | p>chibar2=0,0000 |
| *Hausman* Test | p>chi2=0,0114 | p>chi2=0,0753 | p>chi2=0,0048 | p>chi2=0,0732 |

Note: The values for the coefficients are presented, and below, in parentheses, are the standard errors. Statistical significance is indicated by *10%, **5%, ***1%.

The environmental dimension (ESGA) of ESG demonstrates the companies' performance in managing greenhouse gas emissions, environmental degradation, and product innovation. This dimension is concerned with maintaining a vision of integrity before all stakeholders (Melo *et al.*, 2020). The results demonstrate a positive relationship between the environmental dimension (ESGA) and ETR_DVA, suggesting that more significant involvement in environmental protection actions would imply less tax aggressiveness (López-González *et al.*, 2019).

A survey conducted by the Pacto Global Rede Brasil e Stilingue (2021) showed that discussions on the ESG topic in Brazil grew more than sevenfold in 2020 and revealed that among public opinion, the primary desires are for actions that solve environmental issues, for example, about the situation in the Amazon rainforest. In this context, the results of this research demonstrate that companies with good performance in issues involving the environment, such as support for measures to preserve the Amazon rainforest, control of water and air pollution, soil damage, and good resource management, tend not to avoid paying taxes (Sari & Tjen, 2017).

On the other hand, Pessoa (2019) analyzed the effects of CSR dimensions, with scores assigned by CSRHub®, on the effective rate based on the value added of the DVA of 83 companies listed on B3, finding a negative relationship in the environmental dimension, which implies that the higher the environmental score, the greater the tax aggressiveness of companies. The disagreement with the results can be justified by the composition of the sample analyzed and the ESG scores used, which, in the case of this survey, were assigned by Refinitiv®.

Huseynov and Klamm (2012) argue that heterogeneous results may indicate that the relationship is affected by other variables and that the impact of one ESG variable may differ depending on the strengths and concerns of another ESG variable (Kovermann & Velte, 2021). Huseynov and Klamm (2012) suggest that the quality of corporate governance (including compensation, leadership, and transparency) can affect the relationship between ESG performance in each dimension and tax avoidance.

It is important to note that the relationship between the corporate governance dimension of ESG (ESGG) and tax aggressiveness (ETR and ETR_DVA) was not significant. From this result, it is inferred that the companies in the sample, because they have an implemented corporate governance structure that accredits them to compose the differentiated listing segment of B3, have the potential to balance tax aggressiveness and profitability in a way that the risks do not outweigh the benefits (Proner *et al.*, 2021). This result is similar to that of Potin *et al.* (2016), who did not find significant relationships between corporate governance and tax aggressiveness.

As evidenced in Table 8, the results demonstrate that the different dimensions of ESG have different effects on tax aggressiveness (Laguir *et al.*, 2015).

**Table 8 - Summary ESG impact and its dimensions on tax aggressiveness**

| ESG Dimension | ETR | ETR_DVA |
|---|---|---|
| ESGT | Positive influence | Absence of influence |
| ESGA | Positive influence | Positive influence |
| ESG | Positive influence | Absence of influence |
| ESGG | Absence of influence | Absence of influence |

The result of the regressions does not allow us to reject the hypothesis of this study that ESG practices reduce the tax aggressiveness of companies listed in the differentiated governance segments of B3, considering that there was a positive influence of total ESG (ESGT), environmental (ESGA) and social (ESGS) on the ETR metric. As for ETR_DVA, only the environmental dimension (ESGA) showed a significant relationship, and it is not possible to determine the influence of the other ESG dimensions on the tax aggressiveness measured by the ETR-DVA.

Other variables were included in the empirical analysis of this study, considering that factors other than ESG performance can influence aggressive tax planning (Moraes *et al.*, 2021). However, size (TAM) was significant only with the governance dimension (ESGG), similar to the study by Gomes (2012) that did not find significance in the size variable, although it was contrary to what was expected and recommended in the studies carried out by Honh *et al.* (2021) and Melo *et al.* (2020).

Fixed assets (IMOB) were not significant in any of the eight models for the analyzed sample, corroborating Martinez and Ramalho (2017). However, the intangible variable (INTAN) showed a positive and significant relationship with REE, consistent with Melo *et al.* (2020). The results of the two variables diverge from what was recommended by Hohn *et al.* (2021) and Laguir *et al.* (2015), that companies with higher fixed and intangible values have a lower basis for calculating taxable income and consequently greater tax aggressiveness.

Financial leverage (LEV) was negatively related to ETR_DVA in line with expectations since the increase in indebtedness (deductible interest) is associated with lower tax rates (Melo *et al.*, 2020; Zeng, 2019) and in agreement with the findings of Pessoa (2019), who used the Brazilian metric based on DVA.

The financial performance indicator (ROA) showed a negative relationship with ETR, suggesting that companies with higher profitability are more involved in aggressive tax planning (Mamede Junior *et al.*, 2023; Zeng, 2019). This result is consistent with the findings of Laguir *et al.* (2015) and Marinho and Machado (2023) since the rates are progressive according to income. On the other hand, it is divergent from what Melo *et al.* (2020) found.

In summary, it was evidenced that companies with higher levels of corporate governance, as they are part of the differentiated listing segments of B3, which have higher ESG performance in all dimensions, generally have effective tax management, evidencing greater transparency about tax collection and practices, while minimizing risks, for example, related to theses or other controversial tax issues.

In addition, this research showed that companies with higher performance in environmental preservation practices have less tax aggressiveness since the environmental dimension exerted a significant influence at the level of 1% on ETR and 5% on ETR_DVA. On the other hand, it may indicate that companies with activities that exert more significant impacts on the environment, and therefore, that engage in activities to reduce the effects caused, may also have an aggravated tax burden, with effective rates and higher tax burdens. Regarding ESG performance in the social sphere, the findings indicate that the social performance of corporations has a negative impact on tax aggressiveness. The existing literature can explain this since taxes make up a portion of the income that governments use to promote the social well-being of the population.

Regarding the non-significant results observed in the corporate governance dimension with ETR and ETR_DVA, it is possible to infer that a more robust governance structure signals a reduction in the deviation of managerial conduct, which mitigates the probability of aggressive tax practices.

## 5. FINAL CONSIDERATIONS

Companies have been encouraged to be fully involved in environmental, social, and governance (ESG) issues, both by investors and other stakeholders, which tends to produce higher standards of ethical behavior and compliance with the regulations required of companies, including compliance with tax regulations (Christensen *et al.*, 2022; Ferrell *et al.*, 2016).

The objective of the present study was to investigate the relationship between ESG sustainable performance indicators and tax aggressiveness of Brazilian companies that make up B3's differentiated listing segments. To carry out the study, ETR and ETR_DVA rates were used as *proxies* of tax aggressiveness, and for ESG, Refinitiv® scores were used and applied to a sample of 55 companies.

The results of the regression analyses between ESG and the tax aggressiveness metrics contributed to the non-rejection of the hypothesis of this research, that ESG practices reduce the tax aggressiveness of companies listed in the differentiated governance segments of B3, since the results found indicated a negative influence of the total ESG (ESGT)

and environmental (ESGA) and social (ESGS) dimensions on tax aggressiveness, measured by the ETR. However, as for the ETR_DVA, no significant influence could be inferred, except from the environmental dimension (ESGA).

It is noteworthy that considering the total ESG (ESGT) scores, the results pointed to a positive relationship with ETR, which indicates a negative relationship with tax aggressiveness, considering that the higher the ETR rate, the lower the tax aggressiveness. This result is in line with what is expected according to general ESG conventions: Companies with good ESG performance tend to comply with their tax responsibilities by acting with less tax aggressiveness (Lanis & Richardson, 2011).

Another highlight was the positive relationship found between the environmental dimension (ESGA) and the ETR_DVA metric, suggesting that companies with higher scores on environmental issues, such as support for measures to reduce negative impacts on the Amazon rainforest, good performance in resource management, and product innovations, are less fiscally aggressive (Sari & Tjen, 2017).

In contrast to the literature on the research subject, no significant relationship was established between the variables fixed assets (IMOB) and size (TAM) except in the governance dimension and the metrics for aggressiveness used. However, the variable return on assets (ROA) was negatively associated with ETR. In contrast, the intangible variable (INTAN) showed a positive relationship with both ETR and ETR_DVA in the environmental (ESGA) and governance (ESGG) dimensions. On the other hand, leverage (LEV) showed a negative relationship only with ETR-DVA. It should be noted that results different from those expected may occur due to the composition of the sample and the measurement of the variables used (Davis *et al.*, 2016).

Although a positive relationship is expected between the ESG dimensions individually, there was no significant influence of the governance dimension on tax aggressiveness, which can be attributed to the fact that companies that invest in governance structures seek to balance tax savings and maximizing shareholder value (Proner *et al.*, 2021).

This study contributes to the literature by presenting how sustainable ESG performance impacts the tax aggressiveness of companies in the listing segments that have differentiated corporate governance rules (Novo Mercado and Level 1 and Level 2), pointing out that companies with higher levels of governance and high ESG performance have less tax aggressiveness when this relationship is observed through their effective rates of taxes on profit (ETR). These findings can contribute in a practical way to managers, investors, and financial analysts, directing their attention to companies that adhere to high standards of ethical conduct associated with the adoption of ESG practices and managing their taxes in a responsible and balanced way.

The descriptive statistics of the ESG performance of the companies in the sample demonstrate that there is still ample opportunity for companies to improve their ESG agenda with actions related to the environment, social, and governance. In this sense, the results of this research can help regulatory entities by addressing issues that impact the taxes collected, signaling the need for incentives through government programs and policies that support ESG sustainability practices.

As limitations of the study, the limited number of companies that disclose ESG scores and possible deficiencies in the metrics used are pointed out. For future studies, it is suggested the use of other metrics for tax aggressiveness, such as Cash_ETR (*Effective Tax Rate* by cash flow), which uses in its numerator the taxes on the result actually paid, preventing its value from being altered by the values of deferred taxes and making a direct relationship with the effect of taxes on the cash flow of companies (Hanlon & Heitzman, 2010).

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