


DOES CORPORATE SOCIAL RESPONSIBILITY AFFECT THE TAX AGGRESSIVENESS OF FIRMS? EVIDENCES OF THE BRAZILIAN STOCK MARKET

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ABSTRACT

This research analyzes the effects of the dimensions of corporate social responsibility (CSR) on the level of tax aggressiveness of publicly traded Brazilian companies. To this end, the performance in relation to companies' CSR was identified from the environmental, social and governance dimensions. After that, an aggregate variable was used that represents the general average of the companies in all dimensions. Tax aggressiveness was measured by calculating the effective tax rate (ETR). The analysis period comprised the years 2010 to 2018 and the analyzed models were operationalized from multiple regressions of panel data with estimation by feasible generalized least squares (FGLS). The results reveal a significant relationship between CSR and tax aggressiveness, indicating that adopting more or better CSR practices, regardless of their size, results in a lower level of tax aggressiveness for the companies analyzed in the sample. In general, the findings found reinforce the notion that CSR can affect organizational decisions.

Keywords: Tax aggressiveness. Corporate social responsibility. Effective Tax Rate.

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1 INTRODUCTION

Tax reduction is an indispensable component of a firm's global strategy (França, Moraes, & Martinez, 2015). Several nomenclatures are used in the literature to refer to the practice of tax planning, such as: tax management, tax aggressiveness (Gomes, 2012; Vello & Martinez, 2014; Martinez, 2017; France, 2018). However, without going to the heart of the limits of its legality, with regard to the definition, researchers generally report that tax planning refers to a device used by firms in order to reduce, postpone or even eliminate the tax burden arising from its activities (Dyreg, Hanlon, & Maydew, 2008; Hanlon & Heitzman, 2010; Gomes, 2012; Vello & Martinez, 2014; França, 2018).

Profit maximization (Mills, Erickson, & Maydew, 1998; Santana, 2014; Blaufus, Mohlmann, & Schwäbe, 2019), increased manager remuneration (Rego & Wilson, 2012; Wahab & Holland, 2012; Gaertner, 2014; Gul, Khedmati, & Shams, 2018; Huang, Ying, & Shen, 2018) and the search for simpler tax systems (Elali, 2009) are pointed out in the literature as motivational factors for carrying out the practice.

Despite the financial advantages that tax management can provide for reducing a firm's costs, it is imperative that managers assess whether the benefits of the practice exceed the explicit and implicit costs involved (Chen, Chen, Cheng, & Shevlin, 2010). Explicit costs are related to all the capital expenditures necessary for the effective implementation of planning, such as qualified labor, information systems, strategic coordination among business centers, expenses with auditing, etc.

Implicit costs, on the other hand, do not necessarily require direct capital outlay, but have the ability to affect the firm's value in the long term. Among such costs, there are those linked to corporate reputation, which concerns the way society views the firm's performance and its relationship with the environment (Cruz & Lima, 2010), considered an intangible asset responsible for the continuity of the firm in the long term due to issues of social legitimacy.

In relation to taxes, a firm with a high level of tax aggressiveness faces the risk of becoming involved in corporate scandals, as this aspect has a social nature, in addition to the mere state tax collection. In this way, an aggressive tax firm can be seen as socially irresponsible (Laguir, Stagliano, & Elbaz, 2015), since it compromises the payment of its "fair" portion to society as a compensatory return to its performance, thus affecting the financing public goods and various public policies.

Firms with high levels of commitment to corporate social responsibility (CSR) are expected to return to society a fair share of their activities in the form of payment of taxes and, consequently, exhibit low levels of tax aggressiveness. Studies such as those developed by Lanis and Richardson (2012), Huseynov and Klamm (2012), Chen (2015), Laguir *et al.* (2015), Martinez and Ramalho (2017) and Martinez and Silva (2020) examined the role of socially responsible behavior in firms' tax aggressiveness practices. The results reveal a significant relationship between CSR and tax aggressiveness, reinforcing the concept that CSR can affect organizational decisions.

Despite previous work on the relationship between aggressiveness and CSR, there is still a need for studies that take into account the role of socially responsible attitude in the level of tax aggressiveness of firms. In addition, as highlighted by Oikonomou, Brooks and Pavelin (2012), it is necessary to measure CSR in an aggregated and disaggregated way in research, because, depending on the environment, certain activities, such as those related to the community, can be considered by the local society as more relevant than environmental issues. Thus, an aggregate measure can put into question the real relationship studied.

Based on the above, this study aims to answer the following problem: What are the effects of the CSR dimensions on the tax aggressiveness of Brazilian companies? Objectively, it was proposed to verify the influences of the dimensions of social responsibility on the tax aggressiveness of publicly traded Brazilian companies. CSR is analyzed in an aggregated and

disaggregated way and the social, environmental and governance dimensions are used together, forming a score for CSR, and in a disaggregated way, taking into account each dimension and its relationship with tax aggressiveness.

This research contributes with new results regarding the role of CSR on the tax aggressiveness of firms, especially in emerging contexts, since the understanding of what constitutes a socially responsible attitude varies according to the institutional environment in which the firm operates, due to cultural and economic issues (Aguinis & Glavas, 2012; Rodrigo, Duran, & Arenas, 2016; Jamali & Karam, 2018). Thus, it is intended to contribute to the literature that investigates the relationship between tax aggressiveness and corporate social responsibility, providing evidence about the relationship in the context of publicly traded Brazilian companies.

In a practical way, the study may indicate to government entities, as tax authorities, a signal regarding the realization of tax aggressiveness. In addition, it can assist people involved in business areas, such as investors and consultants, in identifying situations in which CSR activities are related to tax management.

2 LITERATURE REVIEW

2.1 Corporate Social Responsibility

The term corporate social responsibility (CSR) is sometimes used as a synonym for corporate sustainability, corporate responsibility, corporate citizenship, business ethics, sustainable business development and stakeholder management (Carroll, 2008; Machado, Machado, & Corrar, 2009; Carroll, 2015). However, although there is no homogeneous and unquestionable concept, the idea that supports CSR is that companies assume responsibilities beyond the legal scope for environmental, social and economic issues (Jo & Harjoto, 2011; Cai, Jo, & Pan, 2011; Cai, Jo, & Pan, 2012).

Discussions related to the inclusion of socio-environmental concerns in business practices are not a recent phenomenon. From a historical retrospective, it is possible to see that the concerns linked to the modus operandi of firms and their relationship with the environment in which they operate are at the heart of economic development (Carroll, 2015).

Economist Milton Friedman is among the main opponents of CSR. Based on the classic liberal economic argument, the author argues that the responsibility of companies consists in maximizing their profits. For Friedman (1962; 1972), any distancing from this function would lead to undue pecuniary deviations of uncertain return that could place the firm, at times, in situations of competitive disadvantage in relation to its peers who did not make socially responsible investments.

Furthermore, with a focus on the potential agency conflicts, described by Berle and Means (1932), to which modern corporations are subject, Friedman (1972) puts into question the conduct of opportunistic managers. These can divert the firm's resources under the heading of socially responsible investments, with the real intention of creating a social reputation at the expense of the organization's central interests. Thus, Friedman (1972) suggests that problems of a social nature should be solved through the joint efforts of public agents and civil society, since the economy is based on the free market system.

In contrast to the discourse defended by Friedman (1962), the stakeholder view, raised by Freeman (1984), understands that the firm constitutes a nexus of contracts not only with its shareholders and agents, but with all interested parties in society, even if indirectly, thus forming an implicit social contract. The stakeholders described by Freeman (1984) include governments, consumers, the media, suppliers and the general community, in addition to investors. For the author, investments in CSR are reverted to the disposition and social

support necessary for the maintenance of firms in the long term and, together, balance the corporate objectives related to the maximization of profits without losing sight of moral and ethical obligations endorsed or required by society (Jo & Harjoto, 2011). Given that social and environmental issues represent restrictions on the performance of firms, for Laguir *et al.* (2015), investment in CSR is justified when it is able to integrate social, environmental and economic objectives.

Thus, the fact that companies create and manage information on ethics and social responsibility is part of this implicit modality of the social contract between the company and society. Thus, the non-fulfillment of these social obligations can trigger loss of the legitimacy of these organizations, and may even interfere with their credibility as an organization (Deegan, 2002).

In this context, CSR is related to several assessment areas, among which tax aggressiveness has gained prominence in recent years, culminating in debates on justice, transparency and social responsibility itself (Whait, Christ, Ortas, & Burritt, 2018).

2.2 Tax aggressiveness

The term tax aggressiveness refers to activities, lawful or illegal, adopted by companies with a view to reducing, postponing or eliminating tax expenditures (Gomes, 2012). According to Martinez (2017, p. 108) "tax aggressiveness aims a priori to reduce tax obligations, through the process of organizing business activities so that tax obligations are optimized to their minimum amount".

Scholes, Wilson and Wolfson (1992) highlight that, in addition to reducing the tax burden, tax aggressiveness is based on the creation of value for the company and, consequently, the increase in wealth to be distributed to shareholders. The work by Scholes *et al.* (1992), considered the landmark of the revival of empirical research in tax accounting, highlighted the need for researchers to expand the object of study, incorporating principles, theories and evidence from other areas of knowledge.

The work of Scholes *et al.* (1992) gained prominence on the world stage when addressing the multidisciplinary nature of tax management, highlighting three essential foundations in the elaboration of a tax planning considered efficient: all parts, all taxes and all costs. Calijuri (2009) states that in the all parts foundation, the professional responsible for implementing the planning must consider all parties involved in the transaction. This contractual conception expresses that, if the company aims to obtain return on investments after taxes, it is essential to consider all parts of the contract, at the time of contracting, as well as in the future.

For Gomes (2012), the all taxes foundation relates to all taxes involved in investment decisions and decision-making, and it is relevant that the planner considers not only the tax burden spent on cash, but also implicit taxes, paid indirectly in lower rates of return before taxes on investments favored with incentives. Finally, the all costs foundation concerns all costs, implicit and explicit, incurred in the practice of tax planning, and not just the tax burden, considered one among several costs of the process (Santana, 2014).

In this sense, according to Teixeira (2018), even if taxes act as a relevant factor for the structuring of companies and, therefore, need due attention, decision making by managers, to minimize tax expenditure, should not be only based on the legal-tax aspect. Thus, all the variables involved in the process of preparing tax planning, of a tax nature or not, are important for the purpose of the fiscal economy to be achieved efficiently.

2.3 Empirical evidence on CSR and Tax aggressiveness

Among the empirical evidence that assesses the relationship between CSR and tax aggressiveness of companies, the following are highlighted, which guided this study.

Lanis and Richardson (2012) examined the association between CSR and tax aggressiveness in the Australian context. The research hypothesis is that the greater the firm's involvement in CSR activities, measured from the level of disclosure of such practices, the lower the likelihood of being involved in aggressive tax management. The study sample consisted of 408 publicly traded companies that had shares listed in the period 2008 and 2009. The results confirm the tested hypothesis that the higher the level of a firm's CSR activities, the lower the propensity to engage in practices of tax aggressiveness.

Huseynov and Klamm (2012) examined the effects of CSR, assessed from the firm's weaknesses and strengths in relation to social dimensions (community and diversity) and corporate governance, in the practice of tax management of American firms in the period from 2000 to 2008. The evidence found reveals that the weaknesses in the community dimension positively affect the practice of tax management, while the strengths related to the dimensions of corporate governance affect it negatively.

Chen (2015) investigated from 2008 to 2014 the impacts of CSR on tax aggressiveness in the Chinese market. The results confirm the findings of Lanis and Richardson (2012), reinforcing that CSR significantly affects the propensity of managers to practice aggressive tax management.

In the French market, Laguir *et al.* (2015) investigated the effect of the different dimensions of CSR on the practice of tax aggressiveness by firms. The sample used in the study included French publicly traded companies from 2003 to 2011. The effect of four dimensions of CSR to analyze: social, environmental, corporate and economic governance was analyzed. The research findings reveal that CSR affects tax aggressiveness, but depends on the nature of the CSR activities investigated. The social dimension had a negative impact on aggressiveness; however, the economic dimension showed a positive relationship.

López-González, Martínez-Ferrero and García-Meca (2019) studied whether corporate social responsibility affected tax evasion, highlighting family businesses. The authors analyzed companies from several capital markets, from America, Europe, the Middle East, Africa and Asia. The results indicated that the CSR dimensions that comprise social and environmental performance were negatively related to tax evasion, indicating that companies with better socially responsible practices had less tax-saving practices.

Sari and Prihandini (2019) also assessed the relationship between CSR and tax aggressiveness in the Indonesian stock market, between 2016 and 2017. The authors considered the social, economic and environmental dimensions. The results indicated that the economic dimension of CSR positively impacts the level of tax aggressiveness, while the social and environmental dimensions negatively affect aggressiveness.

In Brazil, Martinez and Ramalho (2017) investigated the level of tax aggressiveness of Brazilian firms listed in the Corporate Sustainability Index (CSI), from 2010 to 2014. CSI, used as a proxy for CSR, is a theoretical portfolio of shares in the Brazilian market, launched in 2005, by the former BM & FBovespa with the objective of being a benchmark for investors interested in socio-environmental issues. It reflects the return of the shares of Brazilian firms that excel in practices related to social responsibility and sustainability. The results indicated that the firms participating in the CSI, in the analyzed period, presented low rates of tax aggressiveness when compared to firms that do not belong to the index.

3 METHODOLOGY

3.1 Research typology

As highlighted, this paper sought to analyze the relationship between CSR and the tax aggressiveness of companies listed on the Brasil Balcão Exchange (B3). Thus, it can be considered quantitative, since it uses statistical procedures to solve the problem; descriptive, since it aims to study and portray the relationships between variables and facts; and, finally, documentary, since it uses reports and other documents with information not yet examined (Lakatos & Marconi, 2007; Martins & Theóphilo, 2009).

3.2 Sample design and data collection procedure

The sample was made up of publicly traded Brazilian firms listed on B3, from 2010 to 2018. The period of analysis selected is justified by virtue of the convergence with international accounting standards, which Brazilian firms have adopted since 2010. Thus, all the firms in the sample are subject to the same normative standard, avoiding interferences in the reliability of the analysis.

The data necessary for the construction of the variables were obtained using the Thomson Reuters® and Economatica® databases. Firms with missing data and those belonging to the tobacco and alcoholic beverages sector were excluded from the sample. The exclusion of such sectors is due to specific regulations regarding the tax matters to which they are subject. In addition, the financial sector was excluded due to its peculiarities regarding accounting practices and its own regulation. The final sample of the study included 71 companies over nine years, composing an unbalanced panel with 505 observations (Table 1).

Table 1

Sample composition

Sample	Qty.
Companies – Economatica Base	602
Exclusions	
Financial sector	115
Companies with negative PL	75
Companies with no data	341
Final	71

Source: Elaborated by the authors.

3.3 Analysis variables and econometric model

As a proxy to measure tax aggressiveness, a variable dependent on this study, the effective tax rate (ETR) was used, calculated by the ratio between expenses with income tax and social contribution on net income and profit before income tax.

This proxy indicates the effect of the tax burden on the results of companies (Laguir *et al.*, 2015; López-González *et al.*, 2019; Sari & Prihandini, 2019). The choice of ETR as a measure for tax aggressiveness in this study is justified by its wide use in studies focused on tax issues (Lanis & Richardson, 2012).

Thus, considering that the variable is calculated by tax expenses on profit before these taxes, there are, for its interpretation in this study, that: higher values for ETR indicate less tax aggressiveness, while lower values for ETR represent greater tax aggressiveness.

The independent variable CSR was extracted from the Thomson Reuters® database, which provides a set of measures on CSR for firms in several countries, calculated from public information available in different information channels (websites, investor relations channels, widely circulated newspapers, etc.).

The choice for that base is justified by virtue of its global scope and the objective way in which measures are measured. All measures employed in the study as a proxy for CSR performance vary between 0% and 100% and represent the average score obtained by firms in ten CSR-related categories (workforce, human rights, community, product responsibility, management, shareholders, CSR strategies, use of natural resources, emission of pollutants and environmental innovation).

Firms with better performance in socioenvironmental activities were expected to engage less in aggressive fiscal economy practices. Despite this, previous studies indicate that this does not happen for all dimensions of CSR. Figure 1 shows the description of the 4 metrics used in the study as a proxy for firms' CSR performance.

Acronym	Description	Authors	Expected Sign*
CSR_A	Indicates the average performance of the firm in matters related to the use of natural resources, pollutant emission policies and investments in environmental innovation.	López-González <i>et al.</i> , (2019); Sari e Prihandini (2019)	+
CSR_S	Indicates the average performance of the firm in matters related to the community, product responsibility, workforce and human rights.	Laguir <i>et al.</i> (2015); López-González <i>et al.</i> , (2019); Sari e Prihandini (2019)	+
CSR_G	Indicates the average performance of the firm in matters related to relations with shareholders, management, shareholders and CSR strategies.	Laguir <i>et al.</i> (2015)	+
CSR_Total	Indicates the average performance of the firm in the three dimensions of CSR: environmental, social and governance.	Garcia, Silva e Orsato (2017)	+

Figure 1. Description of the CSR measures used. **Note.** (*) represents the expected relationship that the coefficient of each of the variables is expected to assume in relation to the model-dependent variable. Source: Prepared by the authors.

The choice for more than one CSR metric is due to the need to assess the individual impact of the different dimensions of CSR on the variable it is intended to analyze (Oikonomou *et al.*, 2012; Laguir *et al.*, 2015; Sari & Prihandini, 2019), in this case, tax aggressiveness.

Additionally, in order to ensure that the effect of CSR on the tax aggressiveness of firms is not spurious, due to biases related to the omission of variables, a set of control variables selected from other studies that dealt with the analyzed relationship was employed in this study (Lanis & Richardson, 2012; Huseynov & Klamm, 2012; Laguir *et al.*, 2015; Martinez & Ramalho, 2017; López-González *et al.*, 2019; Sari & Prihandini, 2019).

Previous research (Dyreng *et al.*, 2008; Cho, Roberts & Patten, 2010; Laguir *et al.*, 2015; Sari & Prihandini, 2019) suggest that large firms are more taxing aggressive, since they have greater economic power to cover the direct and indirect costs arising from the practice.

Regarding the variables leverage (ALV), capital intensity (INTC) and intangibility (ITNG), negative associations are expected (Hoi, Wu & Zhang, 2013; Laguir *et al.*, 2015). The higher the level of these variables, the lower the taxable profit calculation base in the firm, since these variables provide deductibility due to interest payments, depreciation and intangible expenses, respectively (Hoi *et al.*, 2013; Laguir *et al.*, 2015).

The maturity variable (MAT) is measured from the number of years that the company is trading its shares on the stock exchange. A positive relationship between MAT and ETR is expected, since firms listed for less time tend to have a higher probability of financial irregularities, in order to meet expectations of market gains (Lanis & Richardson, 2012).

Finally, the return on assets (ROA) variable was used as a proxy for the companies' financial performance, in order to investigate a possible relationship with the ETR. There is no defined relationship in the literature, and therefore the sign of the coefficient can be positive or negative (Adhikari, Derashid & Zhang, 2006; Lanis & Richardson, 2012; Laguir *et al.*, 2015).

Figure 2 presents a summary of the control variables used, as well as their respective proxies and expected signals.

Variable	Acronym	Description	Authors	Expected Signal*
Leverage	ALV	$\frac{\text{Interest-bearing liabilities}}{\text{Total assets}}$	Hoi <i>et al.</i> (2013); Laguir <i>et al.</i> (2015)	-
Intangibility	ITNG	$\frac{\text{Intangible assets}}{\text{Total assets}}$	Hoi <i>et al.</i> (2013); Laguir <i>et al.</i> , (2015)	-
Maturity	MAT	Ln stock exchange time	Lanis e Richardson (2012)	+
Size	TAM	Ln of total assets	Dyreg <i>et al.</i> (2008); Cho, Roberts e Patten (2010); Laguir <i>et al.</i> (2015); Sari e Prihandini (2019)	-
Capital intensity	INTC	$\frac{\text{Fixed assets}}{\text{Total assets}}$	Hoi <i>et al.</i> (2013); Laguir <i>et al.</i> (2015)	-
Financial performance	ROA	$\frac{\text{Net profit}}{\text{Total assets}}$	Adhikari <i>et al.</i> (2006); Lanis e Richardson (2012); Laguir <i>et al.</i> (2015)	+/-

Figure 2. Control variables used and associations expected in the study

Note. ln: natural logarithm.

Source: Prepared by the authors.

In order to verify the effect of CSR on the tax aggressiveness of publicly traded Brazilian firms, models (1), (2), (3) and (4) were estimated below, using the regression approach for data on panel. The choice for this approach is due to the temporal nature of the data included in the panel sample (Marques, 2000; Cameron & Trivedi, 2005; Baltagi, 2005).

$$(1) ETR_{it} = \beta_0 + \beta_1 CSR_A_{it} + \beta_2 MAT_{it} + \beta_3 TAM_{it} + \beta_4 ALV_{it} + \beta_5 ROA_{it} + \beta_6 INTC_{it} + \beta_7 ITNG_{it} + C_i + \varepsilon_{it}$$

$$(2) ETR_{it} = \beta_0 + \beta_1 CSR_S_{it} + \beta_2 MAT_{it} + \beta_3 TAM_{it} + \beta_4 ALV_{it} + \beta_5 ROA_{it} + \beta_6 INTC_{it} + \beta_7 ITNG_{it} + C_i + \varepsilon_{it}$$

$$(3) ETR_{it} = \beta_0 + \beta_1 CSR_G_{it} + \beta_2 MAT_{it} + \beta_3 TAM_{it} + \beta_4 ALV_{it} + \beta_5 ROA_{it} + \beta_6 INTC_{it} + \beta_7 ITNG_{it} + C_i + \varepsilon_{it}$$

$$(4) ETR_{it} = \beta_0 + \beta_1 CSR_Total_{it} + \beta_2 MAT_{it} + \beta_3 TAM_{it} + \beta_4 ALV_{it} + \beta_5 ROA_{it} + \beta_6 INTC_{it} + \beta_7 ITNG_{it} + C_i + \varepsilon_{it}$$

On what:

i: corresponds to the *i*-th company in the sample - from 1 to 71;

t: corresponds to the year under analysis - from 2010 to 2018.

β_0 : denotes the model's intercept;

β_n : slope of the n th explanatory variable;

ETR: tax aggressiveness of companies;

CSR_A: environmental dimension of CSR;

CSR_S: social dimension of CSR;

CSR_G: corporate governance dimension of CSR;

CSR_Total: joint dimension of CSR, considering the environmental, social and governance aspects;

MAT: maturity in years;

TAM: size of firms, measured by the \ln of total assets;

ALV: leverage of firms;

ROA: financial performance;

INTC: capital intensity;

ITNG: firm intangibility;

c_i the component that indicates the specific unobservable individual effect, which differs between companies and is time-invariant;

ε_{it} : idiosyncratic error, which varies randomly for all companies and periods.

3.4 Strategy for estimating the econometric model

According to Greene (2003), the panel data approach can be performed by estimating pooled models, with fixed and random effects. Chow tests (H0: Pooled and H1: fixed effects); Breusch-Pagan (H0: pooled and H1: random effects); and Hausman's (H0: fixed effects H1: random effects) are used to choose the most suitable among the three.

The Wooldridge and Wald tests test for the existence of first-order autocorrelation and heteroscedasticity of the residue's problems. In the case of the estimates made in this work, the presence of both was verified, so the models were estimated by the method of feasible generalized least squares (FGLS), following the recommendation of Davidson and Mackinnon (1993).

4 ANALYSIS AND DISCUSSION OF RESULTS

Table 2 shows the results of the descriptive statistics of the variables used in this research. The model-dependent variable - ETR - has an average of 0.3011 and a median of 0.2604. These figures indicate that Brazilian firms avail themselves of the benefits derived from tax planning, since the effective rate (ETR) is lower than the nominal rate of taxes defined in Brazilian legislation, of 34%.

Regarding the variables that measured the CSR, the CSR_S variable had the best average performance in relation to the other CSR metrics. This finding points out that, for the analyzed sample, companies have a greater capacity to generate reliability and loyalty with society, customers and their human capital, being an important indicator of reputation and social license to operationalize their activities (Bansal, 2005; Chollet & Sandwidi, 2018).

Starting with the analysis of the models proposed in the study, the test results indicate that the models with random effects are preferable in relation to the pooled models and with fixed effects. As for the analysis of the Wooldridge and Wald tests, there were problems of first-order autocorrelation and heteroscedasticity. In this way, the models were again estimated via FGLS.

Tables 2 and 3 show the results of the estimates for the four models used in this study, in order to analyze the effect of CSR on the tax aggressiveness of firms. In all models, the dependent variable represents the level of tax aggressiveness, measured through the ETR, of

Brazilian companies. The first model uses the influence of the total score of social responsibility in the firms' ETR. In the second model, the independent variable of CSR interest was measured through its social dimension. The third was generated considering the corporate governance dimension of social responsibility and, finally, the last model considered the environmental dimension.

Table 2
Descriptive statistics of the variables used in the models

Variables	Average	Median	Minimum	Maximum	Standard Deviation
ETR	0.3011	0.2604	0.0000	4.1847	0.3263
CSR_Total	54.6703	56.8662	11.7172	89.7048	15.6186
CSR_S	59.1854	61.4214	6.5908	98.1646	21.3281
CSR_G	49.8614	49.9287	3.4269	96.8995	18.4518
CSR_A	54.2692	56.6993	6.9043	90.1523	19.5944
MAT	3.2757	3.4657	0.6931	4.7622	0.8128
TAM	16.5082	16.4271	13.7020	20.6181	1.2631
ALV	-0.3539	1.6052	-829.5540	32.8081	38.2902
ROA	0.0472	0.0478	-1.6941	0.4110	0.1345
INTC	0.2324	0.2030	0.0000	0.8989	0.2155
ITNG	0.1844	0.1198	0.0000	0.8558	0.2020

Source: Research results.

Table 3
FGLS estimates for models (1), (2), (3) and (4) considering different dimensions of CSR

Independent variables	Model 1	Model 2	Model 3	Model 4
	CSR_Total	CSR_S	CSR_G	CSR_A
Social responsibility	0.0014038*** (0.0002875)	0.0010327*** (0.0002359)	0.0004985*** (0.0000289)	0.0009447*** (0.000219)
MAT	0.0328938*** (0.0065627)	0.035581*** (0.0065083)	0.0135423* (0.0070761)	0.0386445*** (0.006356)
TAM	-0.015294*** (0.0056973)	-0.0160515*** (0.0059859)	0.0013541 (0.0048792)	-0.015992*** (0.0058878)
ALV	-0.0000932 (0.0001606)	-0.000092 (0.0001648)	-0.0000792 (0.0001533)	-0.0001087 (0.0001643)
ROA	0.054957** (0.0300325)	0.0532602* (0.0291212)	0.0883738** (0.0430922)	0.0549878* (0.032955)
INTC	0.1379777*** (0.0201918)	0.1418963*** (0.0198314)	0.0711699*** (0.021365)	0.1355442*** (0.02011895)
ITNG	0.1741333*** (0.0328918)	0.1713715*** (0.0328106)	0.0563349** (0.0235675)	0.1532301*** (0.0331112)
Constant	0.2253449** (0.0917622)	0.2448778** (0.0943836)	0.1183155 (0.0880869)	0.2543495*** (0.0944353)
Number of observations	505	505	505	505
Number of groups	71	71	71	71
VIF test	1,19	1,21	1,14	1,20
Chow test	p>F= 0.0000	p>F= 0.0000	p>F= 0.0000	p>F= 0.0000
Breusch-Pagan test	p>F= 0.0003	p>F= 0.0004	p>F= 0.0005	p>F= 0.0007
Hausman test	p>F= 0.9834	p>F= 0.8807	p>F= 0.5148	p>F= 0.9638
Wooldridge test	p>F= 0.0052	p>F= 0.0198	p>F= 0.0045	p>F= 0.0000
Wald test	p>F= 0.0004	Prob>chi12 = 0.0000	Prob>chi12 = 0.0000	Prob>chi12 = 0.0000

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

Source: Research results.

Initially, the MAT variable, which represents the time the company has been listed on the stock exchange, in years, was significant for all models and showed a positive relationship with ETR, indicating that companies that have been on the stock exchange for a longer period show less tax aggressiveness. This result was as expected, since, according to Lanis and Richardson (2012), newer companies on the stock exchange are expected to have lower ETR values, being more aggressive, as they would tend to incur greater financial irregularities for present good results to investors.

The variable TAM, which represents the size of companies, measured by the *ln* of total assets, was statistically significant for models (1), (2) and (4), which consider the total, social and environmental dimensions of social responsibility. The sign of the dimensions of the CSR with the ETR was negative, as expected, as it is assumed that large firms have greater tax aggressiveness, as they have greater economic and political power in relation to the small ones, also demonstrating greater capacity to reduce their tax burden.

This result is in agreement with Richardson and Lanis (2007), who found the negative relationship between ETR and the size of Australian companies. For the Brazilian context, the study by Martinez and Silva (2020) also revealed that large companies tend to show a high level of tax aggressiveness. In general, the authors argue that this result refers to the theory of political power, which brings the understanding that larger companies would have lower ETR, as they would achieve, based on their availability of resources, greater tax savings from planning.

For the leverage variable (ALV), a negative relationship with the ETR was also expected (Cf. Hoi *et al.*, 2013; Laguir *et al.*, 2015), given the interest deductibility for the tax calculation base. In this study, the leverage variable was not significant to explain the tax aggressiveness of publicly traded Brazilian companies in any of the models.

The expected relationship for the variable ROA, which measures the financial performance of companies, was uncertain, due to the findings of previous studies (Adhikari *et al.*, 2006; Lanis & Richardson, 2012; Laguir *et al.*, 2015). In this work, it was significant and positive for the four models analyzed. This indicates that a better financial performance of companies would be linked to less tax aggressiveness as measured by the ETR, that is, companies with higher profitability would be less subject to tax-saving practices.

The capital intensity variable (INTC) showed a positive and significant relationship for the four models under analysis. A negative relationship between INTC and ETR was expected, since companies with higher values of fixed assets tend to have some tax protection, since they have the portion to be deducted in relation to the depreciation of these fixed assets (Richardson & Lanis, 2007; Lanis & Richardson, 2012).

The same behavior of the capital intensity variable happened with the intangibility variable (ITNG), which presented a positive and significant relationship with the ETR for the four models analyzed. Due to the fact that intellectual property, contained in companies' intangibles, increases opportunities to reduce taxes and tax credit, ITNG was expected to reduce ETR, indicating greater tax aggressiveness (Richardson & Lanis, 2007; Goh, Lee, Lim, & Shevlin, 2016).

To explain this difference between expected (negative) and found (positive) signs for the INTC and ITNG variables, which seems to be in the Brazilian context (eg: Chiachio & Martinez, 2019, Silva, 2017), there is a possibility that they present some inefficiency management of tangible and intangible assets. One possibility is the financial inefficiency of these assets, considering that companies may be financing them without marginal gain in relation to financing through equity and third parties. This means that companies are looking for onerous financing rates that compromise the fair value of assets (Barclay & Smith, 2005,

Lim, 2012, Stickney & McGee, 1982), so that the effect of taxes on profit is generated by leverage on the company's onerous debts.

Another possibility for the positive effect of the INTC and ITNG variables would be that companies are using rates equal to or very close to those admitted by the Brazilian tax authorities (e.g., Magazine Luiza and AMBEV). This evidence can be confirmed by the lack of information in the reconciliation of the taxable tax base presented in the company's explanatory notes (e.g., Magazine Luiz, AMBEV and AES Tietê).

Anyway, as INTC and ITNG were not study variables, it is recommended that future research be developed, in order to effectively verify what could be the real causes of the divergence of the expected signals in these variables for those that were found.

Finally, all the estimated dimensions (social, environmental, corporate and total governance) were significant to explain the ETR variable. The relationship found between the dimensions and the ETR was positive and significant at 1%, indicating that the dimensions of the CSR positively influence the ETR, that is, the more socially responsible a company is, the less its tax aggressiveness tends to be. This result is in line with the general precepts of CSR, according to which companies tend to try to fulfill their social responsibilities and legitimize themselves in society, which makes them less taxing aggressive (Lanis & Richardson, 2011).

The measure of aggregated social responsibility (CSR_Total) showed a behavior in the same direction and with intensity similar to the other dimensions of disaggregated social responsibility, indicating that, for the context of the companies studied, there is no difference in the use of an aggregated or disaggregated measure.

Assessing the social dimension of social responsibility, a positive relationship between the social dimension and the ETR was expected, considering the studies by Laguir *et al.* (2015), López-González *et al.* (2019) and Sari and Prihandini (2019). This dimension involves the general well-being of employees and the workforce, as well as issues related to human rights and responsibility linked to the community. Thus, a positive relationship, as found, indicates that the companies' engagement in the activities described above would increase their ETR, which indicates that the likelihood of these companies being fiscally aggressive would be less.

The corporate governance dimension deals with issues related to shareholders and other stakeholders of the company, considering the well-being of all these parties, in order to balance the creation of value for shareholders with the protection of value for stakeholders (Laguir *et al.*, 2015). In this sense, the positive relationship found, as expected, indicates that the adoption of corporate governance practices by the companies under study also had a negative influence on the tax aggressiveness of these firms, since the variable CSR_G had a positive relationship with the ETR.

The last dimension, the environmental dimension (CSR_A), represents the performance of companies with a view to managing actions related to environmental impacts and environmental degradation, considering the life cycle of products. This dimension focuses on building a company's credibility with external stakeholders, in order to guarantee a vision of integrity and environmental protection (Kovács, 2008). The results corroborate the findings of López-González *et al.* (2019) and Sari and Prihandini (2019), in which it was also possible to find a positive relationship between the environmental dimension of CSR and ETR, indicating that involvement in activities to reduce resources, reduce pollutant emissions and product innovation, for example, it would imply less tax aggressiveness.

5 FINAL CONSIDERATIONS

The main purpose of this study was to analyze how the activities related to CSR were related to the tax aggressiveness of companies in the Brazilian stock market. For this,

different dimensions of CSR were used to assess the relationship with tax aggressiveness. One of the study's contributions is in not only providing evidence on an aggregated CSR measure, which takes into account various aspects of social responsibility, but also assessing disaggregated measures of corporate social responsibility. In this sense, the environmental, social and corporate governance dimensions were used, in addition to the aggregated measure of CSR, taking into account all the information on social responsibility.

Considering this disaggregated information, as suggested by Oikonomou *et al.* (2012), the relationship between these dimensions and tax aggressiveness was studied, as well as in Laguir *et al.* (2015), López-González *et al.* (2019) and Sari and Prihandini (2019). Despite this, this study showed similar results between the aggregated CSR variable and the other dimensions (environmental, social and corporate governance). Even so, contributions are considered important, mainly because they signal a single direction of the different dimensions of social responsibility analysis in relation to tax aggressiveness.

As detailed in the initial part of the study, the literature related to the theme shows that companies with high levels of commitment to CSR have high tax expenditures, arising from their activities and, consequently, have low levels of tax aggressiveness. The results of the four dimensions studied corroborate previous research, by revealing a positive relationship with the study's dependent variable, ETR, which represented tax aggressiveness. This indicates that adopting more or better practices of social responsibility, regardless of the set of activities to which they belong, would be related to less tax aggressiveness in the sample companies.

This result shows that, both for literature and for practice, the tax aggressiveness of companies depends on the social responsibility practices adopted by them, regardless of the nature of these practices. In this context, it is understood that companies that act in such a way as to consider all stakeholders in the organization, manage their resources in an environmentally sustainable way and are concerned with human resources and the community tend to pay the fair share of the due taxes.

The findings on the environmental dimension of the study corroborate the studies by López-González *et al.* (2019) and Sari and Prihandini (2019) and go beyond the studies by Lanis and Richardson (2012) and Laguir *et al.* (2015), who had not found significant relationships between the environmental dimension and tax aggressiveness.

Among the control variables used in the study, it was possible to find a relationship with tax aggressiveness based on the following variables: maturity, measured in years of listing on the stock exchange; size, measured by the total assets of the companies; financial performance, measured from the profitability of assets; capital intensity, proportion of fixed assets in total assets; and intangibility, represented by the volume of intangibles in total assets.

Thus, this study has theoretical and practical implications. Among the theoretical implications, the fact that tax aggressiveness depends on the dimensions of CSR can be listed. The results also bring contributions on the treatment of CSR from aggregated or disaggregated approaches to measurement. In addition, it was revealed that larger companies are more likely to present greater tax aggressiveness.

A unique approach was used for the Brazilian context, when considering the different dimensions of CSR as factors that explain tax aggressiveness. In practical terms, there are possible contributions to the country's tax administration, evidenced by the revelation of the tendency of Brazilian companies to implement fiscally aggressive measures. Additionally, the results can assist investors and consultants on the direction of tax aggressiveness of companies based on their involvement with socially responsible practices.

Among the limitations of the study is the limitation of the sample, which deals with a small portion of the universe of Brazilian companies, despite this being linked to the availability of data. In addition, it can be emphasized as a limiting factor of the study the fact

that only one variable was used to measure tax aggressiveness. Thus, in future research, it is suggested to adopt different measures to capture tax aggressiveness, as well as to investigate specific characteristics of each dimension of social responsibility, in order to understand which of these characteristics may show greater or lesser influence on tax aggressiveness of companies. Finally, it is suggested to study different institutions, such as banks, which were excluded here because they have peculiarities regarding their regulation, in order to verify differences between the sectors of activity.

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