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Impacts of Tax Planning on the Levels of Tax Aggressiveness and Litigation of Brazilian Companies Listed on B3

Impactos do Planejamento Tributário nos Níveis de Agressividade e Litigiosidade Fiscais das Empresas Brasileiras Listadas na B3

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ABSTRACT

This study proposes to classify Brazilian non-financial companies listed on B3 according to the levels of tax aggressiveness and litigation measured through proxies that represent such indicators, between the periods of 2019 to 2022, using the statistical technique of cluster analysis to identify distinct patterns of tax behavior. The research aims to offer a comprehensive analysis that contributes to filling theoretical gaps on the topic and to understanding the consequences of tax practices. The results revealed that, although there may be a correlation between tax aggressiveness and litigation, the most litigious companies are not always those that exhibit more aggressive tax behavior, which suggests that other factors may influence the levels of tax litigation that companies notably present the use of tax installments as tax planning practices.

Keywords: fiscal aggressiveness; fiscal litigation; tax planning.

1. INTRODUCTION

The search for tax savings can place companies' tax planning on a fine line with tax evasion and correspond to an inherent risk of inspection (Andrade et al., 2021), since the fundamental characteristic of evasion is its clear illegality (Lietz, 2013). Besides, it increases uncertainty about future tax payments and increases the complexity of financial statements, which affects the final form

of reports and reduces their transparency (Firmansyah; Muliana, 2018; Drábková; Pech, 2022). Frischmann, Shevlin and Wilson (2008, p. 265) define aggressive tax planning as "that which involves significant tax positions with relatively weak supporting facts".

The reputation of companies plays an important role in tax planning and interferes in tax avoidance decisions, since more reputable companies avoid engaging in more aggressive strategies (França; Monte, 2019). However, it can be said that there is a trade-off between reducing tax costs and the possible increase in corporate reputation costs, in the event that the company adopts a riskier stance and suffers a tax conviction (Silva, 2020), which means that tax avoidance can be considered a natural by-product of managerial decision-making (Hanlon; Heitzman, 2010).

Tax avoidance can be defined as the practices performed by organizations with the aim of reducing the company's tax burden. It is seen as a management activity that generates value, especially when managers act to meet shareholder expectations by taking riskier tax positions that generate greater gains. On the other hand, such practices can put the company at tax risk and impose significant costs on entities, which is why tax avoidance can be seen as a synonym for tax aggressiveness (Firmansyah; Triastie, 2020; Martinez; Cerize, 2020).

Aggressive tax planning practices can result in tax litigation for companies. If the obligations arising from this litigation are classified as possible to occur or do not have a probable or possible outflow of resources or cannot be reliably estimated, the Brazilian Accounting Pronouncements Committee (CPC), Technical Pronouncement 25 (Provisions, Contingent Liabilities and Contingent Assets) states that the entity must disclose the contingent liability in Notes to the Financial Statements (Santos, 2022).

Tax contingencies account for more than 60% of the total disclosed by Brazilian companies, which includes civil, labor and environmental claims besides tax claims. This scenario shows great disparity when compared to tax provisions, with percentages below 50% in relation to total provisions accounted for, which exposes the difficulty in assessing the outcome of a lawsuit by the company and which leads to its disclosure only in Explanatory Notes (Balduino; Borba, 2015; Rosa; Souza, 2019).

In the Brazilian context, which has a high tax burden, with a high and growing number of laws and regulations, high complexity, bureaucracy and lack of clarity in tax obligations and where legislation allows for different interpretations by taxpayers, combined with instability and legal uncertainty (Kappel; Quoos; Zonat-

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to, 2017; Guerra; Guerra, 2022), factors that lead to tax evasion practices and tax planning in order to reduce, avoid or postpone the payment of taxes, as well as increased litigation, the analysis of the levels of tax aggressiveness and litigation become even more relevant for decision-making.

Given this context, the aim of this study is to classify Brazilian non-financial companies listed on the B3 (Brazil Stock Exchange and Over-the-Counter Market) according to their levels of aggressiveness and tax litigation.

The contribution of the research is to provide a better understanding of the riskier tax planning context and the degree of litigiousness of the companies and to contribute academically to the expansion of the literature, filling the gap on the subject of tax aggressiveness and litigiousness. Methodologically, it contributes by using a set of proxies to measure tax aggressiveness and litigiousness.

The results of the study have the potential to make a practical contribution to external users of information, who demand more transparency, but it is known that information does not automatically translate into a better understanding of the issue (Moraes et al., 2021).

This research is also important for accountants, as Morrison (1993), in his essay on off-balance sheet risks, already mentioned that the disclosure of "Off-Balance Sheet Risks" (OBSR) was essential for the survival of the accounting profession, as it could reduce the gap in public expectations of the profession's responsibilities in the search for accurate, reliable, useful and comparable data, in line with the objectives of financial reporting and with a view to protecting the interests of investors and other users of financial statements.

2. THEORETICAL BACKGROUND

2.1. Fiscal aggressiveness

Government pressure to combat taxpayers' abusive tax practices, in response to the growing demand for tax revenue, and the lack of clear definitions of terms such as "tax planning", "aggressive tax planning", "abusive tax planning", "tax evasion" and "tax aggressiveness", both in Brazilian legislation and in the literature, makes it difficult to conceptualize tax aggressiveness (Martinez, 2017). For Martinez (2017), a company's degree of tax aggressiveness measures its drive to reduce its tax burden. However, the fact that a company seeks greater tax aggressiveness does not necessarily imply that it is abusive in its tax planning. At this point, aggressive tax planning is not to be confused with tax evasion, since evasion is illegal. However, it can increase tax risk and is potentially subject to questioning by the tax authorities.

The unified conceptual framework of corporate tax planning lists the seminal notions of Scholes and Wolfson's 1992 work, in which tax evasion is related to a high degree of tax aggressiveness; however, any tax planning with a chance of being challenged and potentially not complying with the law can be classified under tax aggressiveness (Lietz, 2013).

Among the most widely used proxies to measure tax aggressiveness are measures of Effective Tax Rate (ETR), which are calculated by dividing some estimate of tax liability by a measure of pre-tax profit and which capture the average tax rate per monetary unit of income (Lee; Dobiyski; Minton, 2015), such as the Gaap ETR and the Cash ETR.

However, ETR variants reflect all transactions that have some effect on the company's explicit tax liability and do not distinguish between real activities that are favored by tax benefits and those undertaken to reduce taxes (Hanlon; Heitzman, 2010). Thus, another measure as widely used in research as the ETR is the Book Tax Differences (BTD), in which the differences observed between the reconciliation between accounting profit and taxable profit capture any element of tax evasion, since companies with large tax differences measured in tax returns are more likely to be audited and accused of being involved in tax havens (Hanlon; Heitzman, 2010).

However, BTD is also ineffective at identifying tax evasion in companies where managers are willing to reduce both accounting and taxable profit to avoid a tax liability (Lee; Dobiyski; Minton, 2015). There is also difficulty in obtaining public data on taxable profit, which is why BTD is estimated by dividing profit minus tax expenses by the nominal tax rate (Marinho; Machado, 2022).

To adjust a measure of tax aggressiveness to the Brazilian reality by obtaining an informational advantage in terms of the total amount spent on taxes, public fees and social contributions (Martinez; Motta, 2020), TVAS is measured by dividing the tax burden of the Value-Added Statement (VAS) by the value added to be distributed. Thus, in addition to taxes on profit, TDVA includes taxes on turnover, which represent the majority of the tax burden of companies in Brazil.

These metrics show signs of tax aggressiveness in the presence of low ETR and/or TVAS (Chiachio; Martinez, 2019) and high BTD (Delgado et al., 2023), when compared to the estimated nominal tax burden of 34%, which only considers taxes on profit in Brazil (IRPJ of 15% and additional of 10% and CSLL of 9%) (Santos; Oliveira, 2020).

2.2. Tax litigation

The strategies of tax planning can result in savings for the companies (Chaudhry, 2021); however, Oliveira (2023) mentions that they can also generate a tax risk, which is characterized by the possibility of the entities facing litigation arising from controversies, penalties and assessments by the taxing entities.

Tax assets linked to litigation that involve tax issues are also related to tax management and aggressive tax behavior (Anceles; Kronbauer; Pacheco, 2011). Although "an important provision may have been indicated in the judicial deposits account" (Silva, 2019, p. 48), another portion of the account may represent the guarantee provided in processes with an expectation of possible or remote loss, which are not accounted for or even reported in the Explanatory Notes and which are under discussion in the judicial sphere, since the administrative channels do not impose this cost on the taxpayer.

In the Brazilian context, in which “tax legislation provides for the creation of numerous tax liabilities” (Rosa; Souza, 2019, p.17), this scenario demonstrates the relevance of disclosing tax-related information, given the impact that contingent liabilities can have on entities' results and financial situation, a fact that is, to a certain extent, motivated by a portion of subjectivity in the assessment of the expectation of lawsuit losses. However, few studies relate these issues to tax risks, which reflects a path to be explored in the academic sphere (Penha, 2022).

In 2022, tax litigation exceeded R\$5 trillion, covering federal, state and municipal spheres, according to the Diagnosis of Administrative Tax Litigation, carried out by the Federal Revenue Service in partnership with the Inter-American Development Bank (IDB). In 2018, litigation already totaled R\$3.4 trillion, which was equivalent to 50% of the Gross Domestic Product (GDP). The level of litigation brings legal uncertainty and hinders investment in the country and is impacted by the relief of punishability, especially through installment payment programs (COMSEFAZ, 2022).

Despite the existence of tax punishments resulting from acts that reduce taxes, no association was found between the size of the punishment and aggressive tax practices (Silva, 2020), which may be the result of the growing number of tax amnesty programs instituted by governments that grant generous reductions in fines and interest, in which companies that choose to pay their taxes in installments tend to take a more aggressive tax stance, which even suggests that such installments are used as a form of tax planning (Marinho; Machado, 2022), given the evolution of tax liabilities that went from a total of R\$3.5 trillion in 2013 to R\$5.4

With regard to the association between tax risks and tax aggressiveness, research shows divergent results. On the one hand, studies have shown no association between tax evasion and business risk (Firmansyah; Muliana, 2018), apart from the fact that high business risk is not necessarily associated with a low tax rate, even though tax risk is an important component of a company's overall risk (Guenther; Matsunaga; Williams, 2013). Allied to the scarcity of research on the subject, previous literature does not seem to consistently find a relationship between concerns about financial reporting and litigation risk (Cao; Narayanamoorthy, 2013).

The results of these studies are in line with the trade-off exposed above, regarding managers' aversion to taxes and the use of tax planning as a way of reducing this cost for companies with a view to improving the economic and financial performance of the entity, which can lead to greater tax aggressiveness and, consequently, raise the level of tax risk to which the company is exposed, which, on the other hand, is not seen positively by investors in general.

Thus, the issue of tax aggressiveness is an area in which the literature would benefit from a more in-depth analysis (Martinez, 2017). International research reports that the fiscal risk literature is also still imminent and highlights the importance of measuring fiscal aggressiveness and fiscal risk separately and considering their effects together (Drake; Lusch; Stekelberg, 2019).

3. METHODOLOGY

3.1. Population and Sample

Table 1 – Metrics for tax aggressiveness used in the research.

METRIC	FORMULA	EXPECTED RATIO
<i>Gaap</i> ETR	$\text{Gaap ETR} = \frac{\text{Expenses with IRPJ and CSLL}}{\text{LAIR}}$	The smaller, the more aggressive (Marinho; Machado, 2022).
<i>Cash</i> ETR	$\text{Cash ETR} = \frac{\text{Cash outflow for tax payment}}{\text{LAIR}}$	The smaller, the more aggressive (Marinho; Machado, 2022).
ABTD	Regression Residual (*)	The bigger, the more aggressive (Chiachio; Martinez, 2019).
TVAS	$\text{TDVA} = \frac{\text{Taxes, fees and contributions in VAS}}{\text{Total added value to be distributed in VAS}}$	The bigger, the less aggressive (Chiachio; Martinez, 2019).

Source: Prepared by the authors.

trillion in 2016, under the management of the Internal Revenue Service alone (SRF, 2017).

Thus, tax amnesties can increase the degree of litigation and are linked to the level of aggressiveness to the extent that they change taxpayers' assessment of the possibility of being inspected and assessed with the expectation of future amnesties. Thus, more frequent tax amnesty programs would be associated with increased levels of litigation and tax aggressiveness (Shevlin; Thornock; Williams, 2017).

The study population comprised Brazilian publicly traded companies listed on B3, with financial data from the Balance Sheet and Income Statement available on the Economatica® database, which totaled 393 companies. Companies in the financial sector were excluded from the population due to the different characteristics of these entities, in addition to being linked to regulatory bodies such as the Central Bank of Brazil (BACEN) and the Superintendence of Private Insurance (SUSEP) and having a different social contribution rate (15%) than the others (9%) (Magalhães, 2017). Other companies were excluded from the sample

because: (i) the company being in a non-operational phase (1); (ii) the absence of data on assets and liabilities (1); (iii) the absence of other data or the financial statements themselves (16); (iv) the company presenting its registration canceled at B3 (2); (v) the absence of judicial deposits, provisions or contingent tax liabilities (27); (vi) the unavailability of data on the composition of judicial deposits, provisions or contingent liabilities in at least one of the sample periods (133); and (vii) the identification of outliers in the statistical analyses (4). The sample thus comprised 155 companies spread over four years, resulting in a total of 616 observations.

The information on provisions, contingent liabilities, tax and total judicial deposits and adherence to installment payment programs disclosed by the entities was collected from the Notes to the Financial Statements; the amounts of taxes, fees and contributions and the value added to be distributed were obtained from the Value-Added Statement on the B3 website, the CVM or the companies' websites. The long-term interest rate was consulted on the BNDES website. The years selected for the research were 2019 to 2022, because they are the most recent periods and because they show the companies' complete financial statements.

3.2. Metrics for Fiscal Aggressiveness

The measurement of the level of tax aggressiveness of Brazilian non-financial companies listed on B3 was conducted using the metrics most frequently used in tax avoidance research, which are shown in Table 1.

It should be noted that, in the case of Cash ETR, the cash outflow to pay taxes was obtained using the equation: opening balance - closing balance of the Taxes Payable + Tax Expenses account, since the information on the cash outflow relating to taxes included in the Cash Flow Statement, performed using the direct method, does not reflect the possible amount of taxes paid in the period.

In order to expunge the effect of differences arising from tax versus accounting legislation that impact on the calculation of BTD, Abnormal BTD (ABTD) was used. Sant'anna and Bruzoni Jr. (2019), Bruzoni Jr. et al. (2019) and Stoduto, Bruzoni Jr. and Rezende (2020), who used ABTD in their research, considered variables that could explain BTD in publicly traded companies listed in Brazil and which are less likely to be related to aggressive tax planning. Thus, the portion not explained by these variables was considered to be ABTD. The following model, based on the work of Bruzoni Jr. (2016), was used to estimate the ABTD:

$$BTDi,t = \beta_0 + \beta_1 EQPi,t + \beta_2 ESTi,t + \beta_3 IMOBi,t + \beta_4 INTi,t + \beta_5 IOC_{i,t} + \beta_6 TLi,t + \beta_7 CSR_{i,t} + \beta_8 VCAMi,t + \alpha + \epsilon$$

Where:

BTD = Book-tax difference (LAIR - (Expenses with IRPJ and CSLL / 0,34))

EQP = Equity results (available in DRE - Statement of Operations);

EST = Stocks (available on the Balance Sheet);

IMOB = Fixed assets (available on the Balance Sheet);

INT = Intangible (available on the Balance Sheet);

IOC = Interest on Own Capital (PL at t-1 multiplied by the long-term interest rate (TJLP) accumulated in t and LL multiplied by 50%. By law, the estimated interest on equity may not exceed 50% of the net profit for the year. Thus, if PL x TJLP is less than LL x 50%, PL x TJLP is considered, otherwise LL x 50%);

TL = Tax losses (represented by a dummy with a value of 1 when the provisions for IRPJ and CSLL are positive with the indication of tax losses and 0 otherwise, when Real Profit occurred);

CSR = Change in Sales Revenues (available in DRE - Statement of Operations);

VCAM = Cambial variation (dummy variable: 1 for the existence of operations with exchange rate variations and 0 otherwise);

α = specific regression term

ϵ = residue (indicates Abnormal BTD).

To estimate ABTD, it was performed a statistical regression using Gretl software (GNU Regression, Econometric and Timeseries Library), version 2024a, using the Ordinary Least Squares (OLS) model, with the application of robust standard errors in order to avoid heteroscedasticity problems. The portion not explained by the variables, i.e. the regression residual, is the measure of ABTD (Tang; Firth, 2011).

The continuous variables were winsorized at the 1% and 99% levels (Tang; Firth, 2012). However, when forming the clusters, 4 observations were identified which, even after winsorization, remained separate from the others and were combined into a single group. These observations had the highest Gaap ETR and Cash ETR values (3 observations) and TVAS (1 observation). Therefore, these observations were disregarded, and the regression was performed again, without winsorizing the data, since the outliers were removed from the sample.

3.3. Metrics for Tax Litigation

In order to measure the degree of litigiousness of the companies, it was used information on tax litigation measured through the provisions account, contingent liabilities and tax judicial deposits disclosed in the Notes to the Financial Statements. The values obtained for the variables were weighted by the companies' total assets in order to obtain a representative number for each individual entity.

Another important proxy used to measure tax litigation was the payment of taxes by companies through adherence to the tax installment programs instituted by government entities, which was obtained based on the information disclosed in the Explanatory Notes with the help of the keywords "Refis" (which is the Tax Recovery Program), "Amnesty", "Installment Plan", "Refinancing", "Tax Recovery", "PERT", "PERC" and "Tax Transaction". To measure this variable, the information was considered a dummy variable, with a value of 1 for the existence of payment or provision for payment of taxes included in the installment payment programs

Table 2 – Metrics for tax litigation used in the research

METRIC	FORMULA	EXPECTED RESULT
Prov	$Prov = \frac{\text{Tax provisions}}{\text{Total Assets}}$	The bigger it is, the greater litigation.
PCont	$PCont = \frac{\text{Contingent tax liability}}{\text{Total Assets}}$	The bigger it is, the greater litigation.
DepJud	$DepJud = \frac{\text{Tax judicial deposits}}{\text{Total Assets}}$	The bigger it is, the greater litigation.
Parc	Dummy variable: 1 = adherence 0 = non-adherence or lack of information	Adherence could mean a trend towards greater litigation, in the expectation of tax amnesty programs.

Source: Prepared by the authors.

and 0 for non-adherence or lack of information. Table 2 shows the tax litigation metrics used in the research.

3.4. Statistical method

To classify companies into levels of aggressiveness and tax litigation, cluster analysis was used. This is a statistical technique used to analyze conglomerates or groupings, i.e. it is “a group of multivariate techniques whose main purpose is to aggregate objects based on the characteristics they possess” (Hair et al.; 2009, p. 430).

Fávero et al. (2009, p. 196) note that “it is a technique that aims to segregate elements or variables into internally homogeneous, heterogeneous and mutually exclusive groups, based on certain parameters according to a measure of similarity or distance”. It can be conducted using the hierarchical method, in which clusters are created in stages that will agglomerate similar individuals or separate heterogeneous individuals, or the non-hierarchical method, in which the number of groups is defined in advance and their division is based on the internal cohesion and isolation of the groups formed.

Given the characteristics of the sample and the variables, we opted to use the non-hierarchical Two-Step Clustering method, which offers the possibility of working with continuous and categorical variables simultaneously. The technique is applied in two stages: in the first phase the observations are divided into sub-clusters and in the second, into the desired number of clusters. The technique has a high degree of quality in determining groups compared to other hierarchical methods (Gelbard; Goldman; Spiegler, 2007).

The number of clusters was predetermined at 3 in order to group companies into high, medium and low levels of tax aggressiveness and litigation. To create the groups, it was used 4 numerical variables related to tax aggressiveness (Gaap ETR, CashETR, ABTD and TVAS) and 3 numerical variables (PROV, PCONT and DEPJUD) and 1 qualitative variable (PARC) related to tax litigation. Clusters were built for aggressiveness and litigiousness.

As a way of measuring differences between the values of each variable that represents the level of aggressiveness and tax litigation in the clusters, the Kruskal-Wallis test of difference of means for independent samples was carried out. For the PARC variable, the chi-square test was applied in order to check whether there are differences in proportions between companies that

Table 3 – Descriptive statistics of the variables.

VARIABLE	NO. OBSERVATIONS	MEAN	MEDIAN	MINIMUM	MAXIMUM	STANDARD DEVIATION
Proxies for fiscal aggressiveness						
GAAP ETR	616	0,1900	0,1910	-18,7746	34,4932	2,0123
CASH ETR	616	0,1534	0,1755	-27,2359	34,7089	2,1498
ABTD	616	0,0534	0,0269	0,0000	1,0649	0,0970
TVAS	616	0,2980	0,2814	-5,7211	4,0879	0,3853
Proxies for tax litigation						
PROV	616	0,0086	0,0022	0,0000	0,1386	0,0179
PCONT	616	0,1508	0,0339	0,0000	7,2880	0,6246
DEPJUD	616	0,0066	0,0017	0,0000	0,1442	0,0137
PARC (<i>Dummy</i>)	616	0,4058	0,0000	0,0000	1,0000	0,4915

Source: Research data.

have and have not joined installment payment programs between the clusters, which was done using contingency tables. If, in one of the table cells, one of the groups had a count of zero, Fischer's exact test was applied.

The software used for both the cluster analysis and the univariate statistics was SPSS - Statistical Packages for the Social Sciences 29.0.2.0, with a research significance level of 5%.

4. RESULTS

4.1. Descriptive Statistics of the Variables

The result of the descriptive statistics for the variables is shown in Table 3. The proxies for fiscal aggressiveness Gaap ETR and Cash ETR had a mean of 0.1900 and 0.1534, with a standard deviation of 2.0123 and 2.1498, respectively, which may suggest a distance between the most and least aggressive profile in the sample, as can be seen in the minimum (- 18.7446 and -27.2359) and maximum (34.4932 and 34.7089) values of each indicator, as shown in Table 3.

The ABTD showed a mean of 0.0534 with a standard deviation of 0.0970, which is lower compared to the ETR measurements. In the case of BTD, the higher the index, which represents the difference between accounting profit and taxable profit, the higher the level of tax aggressiveness. The sample median was 0.0269 and the maximum value was 1.0649.

The TVAS, which is calculated based on the values of taxes, fees and contributions in the VAS and the total value added to be distributed, had a mean of 0.2980 with a standard deviation of 0.3853. The measure shows that the higher the index, the lower the level of tax aggressiveness. Tax provisions represent, on average, 0.87% of the companies' total assets and did not show a high degree of variability, although some companies in the sample have provisions that represent more than 10% of their total assets.

Tax contingent liabilities are, on average, 15% of total assets; however, some companies have significant amounts assessed by the entities with a probability of possible loss, and which represent two to seven times the total assets of these entities. This variable showed the greatest variability in the sample, with the highest standard deviation among the four tax litigation metrics. On the other hand, tax judicial deposits represent, on average, 0.67% of companies' assets and showed maximum values in the sample of approximately 14% of assets.

The three variables - judicial deposits, provisions and contingent liabilities - had averages without major variations between the periods studied, from 2019 to 2022, which reinforces the evolution of tax liabilities published by the Brazilian Federal Revenue Office (SRF, 2017), which shows the permanence of a culture of insolvency on tax debts or discussions about divergences in the interpretation of the legislation between taxpayers and the tax authorities, which culminate, in part, in the adherence, by approximately 41% of the companies in the sample, to tax installment programs instituted by the governments.

4.2. Formation of Aggressiveness and Tax Litigation Clusters

Initially, it was found that tax aggressiveness cluster 1 grouped together 582 observations (94.5% of the sample), while cluster 2 had 26 observations, and group 3 had 8 observations. Group 3 stands out from the others due to the distance of the means linked to ETR in relation to the means of the sample and the other groups formed, as shown in Table 4.

It can be seen that, in general, the GAAP ETR and CASH ETR metrics have close average values, both in group 1 and group 2, which represent the majority of the sample (98.7%). Thus, it can be said that, for the purposes of proxies for tax aggressiveness in this study, they are similar and did not provide different informa-

Table 4 – Clusters - Aggressiveness and Litigiousness.

METRICS	TOTAL	CLUSTER 1	CLUSTER 2	CLUSTER 3	ESTAT.	
Aggressiveness						
No. Observations	616	582 (94,5%)	26 (4,2%)	8 (1,3%)		
GAAP ETR	0,0019	0,1719	0,1036	1,7886	11,402	***
CASH ETR	0,1534	0,1655	0,1042	-0,5666	14,067	***
ABTD	0,0534	0,0383	0,3891	0,0564	54,658	***
TVAS	0,2980	0,3097	-0,0260	0,5008	7,579	**
Litigiousness						
No. Observations	616	364 (59%)	35 (6%)	217 (35%)		
PROV	0,0086	0,0056	0,0542	0,0062	53,550	***
PCONT	0,1508	0,0732	1,3094	0,0941	38,097	***
DEPJUD	0,0066	0,0056	0,0361	0,0037	34,160	***
PARC 0	366 (59%)	364 (99%)	2 (1%)	0 (0%)	608,1798	***
PARC 1	250 (41%)	0 (0%)	33 (13%)	217 (87%)	608,1798	***

Source: Research data. Note: The values shown are the average values. For the categorical variable PARC, the Yates continuity correction was applied (when one of the groups has fewer than 5 observations) and Fischer's exact test (when one of the groups is equal to zero). Significance level: *** 1% and ** 5%.

tion for classifying the groups. So much so that the predictors, in order of importance in forming the clusters, were: ABTD, TVAS, GAAP ETR and CASH ETR.

Still with regard to the metrics related to ETR, the 26 observations in cluster 2 proved to be the most fiscally aggressive, since, based on Marinho and Machado (2022), a lower ETR can represent greater aggressiveness.

It should be noted that the negative CASH ETR presented in group 3 was due to 2 observations having a higher IR/CS to pay than disbursements made in the year. If these 2 observations were disregarded, the results of the variables would be similar, as in the other groups.

By using ABTD as a proxy for tax aggressiveness, group 2 would also represent a more aggressive profile in relation to the others, according to the theoretical expectation (Marinho; Machado, 2022), since they have a greater difference between accounting profit and tax profit. Thus, according to ETR and ABTD, cluster 2 could be considered the most aggressive among the groups as it has the lowest ETR and the highest BTD. The TVAS confirms cluster 2 as the most aggressive, as it had the lowest tax rate in the

reference, it is the group with the highest average provisions, contingent liabilities and judicial tax deposits and is the cluster with the highest level of litigation among the three groups. This may be due to the fact that the entities have tax practices that are being questioned by the tax authorities but believe that they have good defense arguments for their litigation that remains under discussion, or even because they don't have the interest or financial resources to eliminate the litigation in tax amnesties.

It was observed that for 7 companies in group 2, the 4 years studied (i.e. 28 observations out of the 35 in this group) were classified in this same cluster and most of them had high contingent liabilities in relation to the other observations, although in some cases this contingent liability has reduced over the years, as shown in Table 5, which compares the average provisions, contingent liabilities and judicial deposits of the sample and clusters 2 and 3. This reduction may be due to adherence to amnesty programs, since all these 7 companies have information on adherence to installment plans.

Although group 2 had the highest means of the quantitati-

Table 5 – Comparison of Litigation Averages by Year: Sample x Clusters 2 and 3.

YEAR	MEAN PROVISIONS			MEAN CONTINGENT LIABILITIES			MEAN JUDICIAL DEPOSITS		
	Sample	C2	C3	Sample	C2	C3	Sample	C2	C3
2019	0,0082	0,0451	0,0057	0,1658	1,4387	0,1103	0,0080	0,0475	0,0038
2020	0,0083	0,0501	0,0057	0,1551	1,5281	0,0942	0,0063	0,0400	0,0036
2021	0,0081	0,0575	0,0062	0,1377	1,2853	0,0882	0,0060	0,0328	0,0038
2022	0,0098	0,0630	0,0074	0,1446	1,0374	0,0847	0,0063	0,0254	0,0035

Source: Research data.

value-added declaration. The cluster's negative average was due to 1 observation which showed negative values for both taxes and contributions and value added to be distributed. If the observation were disregarded, the TVAS would be positive, but it would still be the lowest among the 3 groups.

According to the metrics linked to ETR and TVAS, group 1 could be classified with an average level of tax aggressiveness, but it had the lowest average BTD of the 3 groups. Therefore, there is a divergence between the results of the rates linked to ETR and ABTD, which was more important in the formation of the groups.

With regard to litigiousness, cluster 1 grouped 364 observations, the largest part of the sample, while cluster 2 had 35, and group 3 had 217. Group 1 stands out for its lack of adherence to tax installment payment programs, while in group 3, all the observations show adherence, which demonstrates that the qualitative variable was a determining factor in classifying the clusters, especially between groups 1 and 3, which had similar averages for the quantitative variables. The other predictors, in terms of importance, were: provisions, judicial deposits and, lastly, despite high values, contingent liabilities.

In group 2 there are only two observations of companies not adhering to tax installment plans and 33 observations with adherence. Although group 2 has the most observations with adhe-

ve variables linked to tax litigation and group 3 the lowest means, both stand out for their adherence to installment payment programs. The conclusions regarding the higher level of litigation presented by group 2 and the average for group 3 show a behavior consistent with the theoretical expectation and the understanding of the Brazilian Federal Revenue Office (2017), of a culture of insolvency on tax debts in order to be included in debt installment programs with reduced fines, interest and legal charges, a behavior observed in 41% of the sample.

Even though it cannot be said that this type of practice is a reality in companies in clusters 2 and 3, it can be seen that more frequent tax amnesty programs may be associated with increasing levels of litigation and tax aggressiveness (Shevlin; Thornock; Williams, 2017), since there was no consistent reduction in the average provisions, contingent liabilities and judicial deposits among those studied.

Despite not having signed up to installment payment programs to settle their tax litigation, the companies in cluster 1 had the lowest means for tax provisions and contingent liabilities, making this group the least litigious.

All the variables showed a statistical difference between the groups, with a level of significance of 1% (GAAP ETR, CASH ETR, ABTD, PROV, PCONT and DEPJUD) and 5% (TVAS), in the difference of means and proportions (PARC) tests.

The analysis of aggressiveness and litigiousness shows that of the 26 observations with the highest level of aggressiveness, 7 of them, which are concentrated in 4 companies, are also part of the cluster with the highest litigiousness. This result is in line with the theoretical expectation that companies with tax litigation show aggressive behavior from a legal and fiscal point of view (Anceles; Kronbauer; Pacheco, 2011).

However, the results also showed that not always the most aggressive companies are the ones with the most tax litigation, which confirms the understanding of Guerra and Guerra (2022) that tax litigation can be the result of high tax complexity and different interpretations of the law by taxpayers, which leads to an increase in the number of tax disputes.

In addition, as can be seen in the work by Schultz and Costa (2023), which used both aggressiveness and litigiousness metrics to classify companies into groups, the clusters with the highest tax aggressiveness were different from the clusters with the highest tax litigiousness, which had the highest values of the variables linked to litigation, but the highest ETR and lowest BTB, not consistent with the profile of greater tax aggressiveness. In other words, the tax aggressiveness and litigiousness metrics may not be compatible when considered together, due to the weight given to the litigiousness metrics in the composition of the groups, both when these metrics are considered in isolation and together.

5. FINAL CONSIDERATIONS

In light of the complexity of Brazilian legislation and the challenges inherent in tax planning, there is a clear need to analyze the impact of these practices on companies' levels of tax aggressiveness and litigation. Strategies aimed at reducing the tax burden can be located on the borderline between legality and tax evasion, which brings risks and implications for transparency and corporate governance with an impact on the image and reputation of organizations. Although companies face pressure to maximize shareholder returns, such decisions can distort the perception of risk by information users and, in the long term, determine corporate sustainability.

This study aimed to classify and analyze the levels of tax aggressiveness and litigiousness of Brazilian companies listed on

B3 between 2019 and 2022. The study did not intend to investigate whether the practices related to tax aggressiveness adopted by companies are lawful and the motivations for the level of litigation and differs from the initial research by Schultz and Costa (2023) by the refinement of the proxies used, the adoption of cluster analysis for the aggressiveness and litigation groups separately and the more comprehensive sample with more periods studied.

The results show that the aggressiveness and litigiousness metrics considered independently can provide more specific analyses of the formation of tax aggressiveness and litigiousness groups. Although some companies with the most aggressive profile are also classified as the most litigious, in line with the results of previous research (Anceles; Kronbauer; Pacheco, 2011), the companies with the highest level of litigiousness are not always the same ones that are the most aggressive in their tax practices, also in line with other studies (Guerra; Guerra, 2022), which allows the inference that the level of litigiousness is not justified solely by the level of tax aggressiveness.

Another important result is that almost all of the companies classified in groups 2 and 3 of litigation, which represent approximately 41% of the sample, even though they have joined tax installment programs, are the ones that maintain high levels of litigation, verified by the higher averages in these groups compared to group 1, which has not joined tax amnesties. Thus, the theoretical expectation, at this point, that more frequent installment programs may be associated with increased levels of litigation (Shevlin; Thornock; Williams, 2017) was confirmed.

It should be noted that the research is not devoid of limitations, the main ones being the sample, the period, the variables and the methodology used in the study, as well as the difficulties in obtaining public data due to the lack of more complete and comprehensive disclosure of information by companies. It is also worth noting the influence of the judgment of professionals regarding the expectation of losing lawsuits in discussions by companies and the possibility of setting up judicial guarantees by other means than just judicial deposits, such as guarantee insurance, assets, real estate, among others. For future research, we could suggest assessing the level of tax litigation by segregating cases according to the length of time they have been under discussion.

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