

Conservatism, earnings management and tax aggressivity in Brazil

Conservadorismo, gerenciamento de resultados e agressividade tributária no Brasil

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ABSTRACT

This research analyzes the association between accounting conservatism and tax aggressiveness, and earnings management. The sample is composed of non-financial Brazilian companies from 2010 to 2019. The main proxies used were: i) accounting conservatism; ii) Earnings management; and iii) tax aggressiveness. The results found demonstrate that the levels of tax aggressiveness in Brazil are associated with the levels of conservatism of the companies, in addition to showing that the most conservative companies present smaller disparities in the tax burden, even when the effects are controlled by earnings management. In an unprecedented way, the results also present evidence that it makes no sense to analyze tax aggressiveness without considering both the effect of conservatism and that of earnings management together.

Keywords: Tax Aggressiveness; Value Added Tax Rate – TTVA; Accounting Conservatism; Modified Jones Model; Earnings management.

1. INTRODUCTION

Accounting conservatism identifies the predominance of not anticipating any profit, but rather anticipating all losses, through the accumulation of accruals over time (GIVOLY; HAYAN, 2000), so that accounting has a greater tendency to recognize an ex-

pense (or loss) than a revenue or gain (PAULO; FORMIGONI, 2008).

In this context, the literature states that accounting conservatism is a financial reporting approach to investigating and measuring assets and profits, which is conducted with total caution due to economic and business activity uncertainty (PURWANTINI, 2017). From a management perspective, conservatism is an accounting practice that decreases profits (and reduces equity) when faced with bad news but does not increase profits (and increases net assets) in the face of good news (BASU, 1997).

Considering that tax planning motivations can be directly related to the possible impacts of accounting conservatism practices, in addition to earnings management practices, the aim is to answer the following question: what is the influence of the levels of conservatism, present in the accounting information and moderated and/or controlled by earnings management, on the levels of tax aggressiveness in Brazilian companies? The objective of this research originated in the case study conducted by Purwanti (2017), which motivated the analysis of the association between accounting conservatism and tax aggressiveness.

The data used in this research was extracted from Economatica®, which covers the period since the adoption of IFRS in Brazil; the period from 2010 to 2019 was selected. The proxies used in the study are: i) accounting conservatism, using the model proposed by Givoly and Hayn (2002); ii) tax aggressiveness, measured by the tax rate on added value (TTVA).

Assuming that tax aggressiveness can be caused by earnings management (EM), this research controls and moderates the effect of earnings management practices, measured using the Modified Jones model (DECHOW; SLOAN; SWEENEY, 1995) on accounting conservatism.

The results show that levels of tax aggressiveness are statistically significantly associated with the companies' levels of conservatism. These findings suggest that more conservative companies tend to have less aggressive tax planning practices, even when accounting conservatism is controlled and moderated through earnings management. The results are also unprecedented in Brazilian literature, suggesting that explaining tax aggressiveness solely by conservatism or earnings management becomes inefficient, because when the effects are moderated by

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the interaction of these two constant variables, they lose their significance, to the point that it makes no sense to analyze tax aggressiveness without considering the effect of accounting conservatism together with earnings management, given that earnings management has a relevant effect on conservatism.

2. THEORETICAL FRAMEWORK

2.1 Accounting Conservatism

Accounting conservatism has been characterized as a practice that generates higher quality earnings, as it is a bias added to governance that prevents the company from exaggerating earnings efficiently (PURWANTINI, 2017). There is evidence from asymmetric predictability tests that earnings are more timely or competitively sensitive when reflecting publicly available bad news than good news; in other words, earnings are more timely than cash flow, especially when reflecting bad news (BASU, 1997; DECHOW, 1994). Literature argues that the origin of Conservatism comes from the 19th century, when accountants of bankrupt companies had to provision for all probable losses that those companies might have before making any distribution of their assets (WATTS, 1993; ROCHA et al., 2013).

In addition to various definitions, literature also includes studies that present accounting conservatism in two classifications, which are called conditional conservatism and unconditional conservatism (ZHONG; LI, 2017). Conditional conservatism is news-dependent, defined as the asymmetric timeliness of the recognition in accounting profits of news about unrealized gains and losses, which occurs with the commitment of many types of assets. Unconditional conservatism, on the other hand, is independent of news, which occurs with the cost accounting of most intangibles.

It should be noted that the effects of asymmetry and quality of information are consequences of agency conflicts between the principal and the agent (SANTANA; KLANN, 2016). Therefore, the quality of information is seen as fundamental in the context of accounting conservatism, in order to present useful information to the various users, and especially to the agents responsible for company decisions (BARTH et al., 2014).

From the point of view of this research, it is understood that a relevant part of Corporate Governance practices will be captured through the companies' own measures of Conservatism and Earning Management. Ball, Kothari and Robin (2000) consider conservatism to be an important characteristic of corporate governance, and this statement is also corroborated by Costa, Lopes and Costa (2006).

The presumption is that the information reported on future gains and losses will improve in the long term, through communication between managers and investors via the financial statements (CAVALIER-ROSA; TIRAS, 2013). However, it is wor-

th noting that there are still studies which show that managers tend to manipulate accounting information for opportunistic reasons, thus influencing the quality of information (DECHOW; GE; SCHRAND, 2010).

In this context, one of the main objectives of the International Financial Reporting Standards (IFRS) is to standardize, at a global level, the accounting standards that establish the principles, rules and guidelines for recognizing, measuring and reporting accounting facts, in other words, to mitigate earnings management through conservatism (FIGLIOLI; LEMES; LIMA, 2017).

Literature has shown that in some institutional contexts, earnings management has significantly elevated the levels of accounting conservatism, for example, after eliminating the effects of discretionary accruals in European companies, the results show that managers have incentives to manage earnings, and as a result, there has been a significant reduction in the levels of conservatism (GARCÍA LARA; GARCIA OSMA; MORA, 2005).

Afrizal, Yuliusman and Hernando (2020, p. 1452) "state in their research that accounting conservatism has a significant effect on earnings management, i.e. the more conservative companies are, the less governance manipulation takes place, so that earnings management is less probable".

In this context, where it is assumed that earnings management is associated with the level of conservatism, we also include the hypothesis that if earnings management is motivated by tax planning, this can also influence the levels of tax aggressiveness (SUNDEVIK, 2017).

Tax regulation and financial accounting have different purposes and results through different reports, and the difference between the financial report and the tax assessment book occurs in almost all countries. This phenomenon causes tax aggressiveness, which possibly influences taxpayers' tax planning (PURWANTINI, 2017). These differences between accounting profit and tax profit are generally used as a research factor, due to the ability of managers to control profits and tax activity in relation to tax aggressiveness (LEE; VETTER; WILLIAMS, 2015).

The difference between accounting profit and taxable profit, i.e. the difference between the accounting profit calculated according to the accounting standards of each country and the taxable profit calculated according to the tax legislation defined by the government, is generally known as Book-Tax Differences (BTD) (FERREIRA et al., 2012).

Although BTD is a metric that is being explored in various countries, it is a measure that originated in Europe, which has a tax and accounting scenario that is still very different from the Brazilian reality. Martinez and Motta (2017) state that although the BTD and ETR metrics are attractive, they are not suitable for identifying the level of tax aggressiveness in Brazil, given that this measure is also related to other information on companies' financial performance, thus providing a biased measure of aggressiveness. The same is corroborated in the research by Ferreira et al. (2012).

Another restriction pointed out by Martinez and Motta (2017) is that the BTD and ETR metrics are focused only on direct taxes, i.e. taxes on profit, and therefore do not consider aggressiveness in relation to any other tax, severely restricting the analysis of indirect taxes, which are part of the company's total tax burden.

Considering this information, the aim is to understand the extent to which levels of tax aggressiveness become higher or lower as a result of the variability in levels of conservatism. This gives rise to the first hypothesis of this research:

H1: The levels of tax aggressiveness are inversely lower, on average, in relation to firms with higher levels of conservatism.

2.2 Tax Aggressiveness and TTVA in Brazil

In Brazilian literature, there are various definitions of “tax aggressiveness”, also known as “tax planning” or “tax avoidance” in international literature. Tax aggression corresponds to the concept of abusive tax planning, i.e. a taxpayer's planned action that translates into apparently lawful behavior, generating a tax advantage (COURINHA, 2004).

It should also be noted that in literature there is no universally accepted definition of the concept of tax aggressiveness, so that each researcher has a different understanding. Tax aggressiveness is defined in much of the world as an attempt at tax deduction and reflects all transactions that influence the company's explicit tax liabilities (HANLON; HEITZMAN, 2010).

The fact that taxes directly impact cash flows and consequently distributable dividends suggests that entrepreneurs manage earnings to maximize their wealth through aggressive taxation (ANNUAR; SALIHU; SHEIKH OBID, 2014). If tax aggressiveness is attractive to the company, owners structure appropriate incentives to ensure that managers make efficient tax management decisions, i.e. corporate tax decisions that generate increased wealth for entrepreneurs, so that the benefits outweigh the costs (HANLON; HEITZMAN, 2010).

Although there are many questions in the literature about the effectiveness of measures as tax planning variables, there are several metrics, considering that there is a certain difficulty for researchers to adequately measure tax aggressiveness through financial statements, given that accounting rules are different from tax rules (HANLON; HEITZMAN, 2010; SILVA, 2016).

In order to capture the tax burden rate, this study uses the TTVA (Tax Rate on Value Added) metric, which is measured using the Tax Burden from the Statement of Value Added (DVA) divided by the Total Value Added to be Distributed, since it is presented in a theoretical way, and is more in line with the main objective of this study, given that this measure in Brazil is extracted from the DVA, and therefore promotes a broader approach to the tax burden by involving taxes from all government spheres (municipal, state and federal) (SILVA, 2016).

Mamede Junior (2021), following the same line of research as Vieira (2020), states that the DVA, by offering information re-

lated to taxes, fees and contributions, promotes a broader approach to measuring the tax burden, considering not only taxes on profit, but also on the firm's total turnover (DE OLIVEIRA CHIACHIO; MARTINEZ, 2018).

There are various motivations that drive the practice of tax planning by companies. Therefore, in the broad sense, all the parties and factors that influence the various objectives of companies to resort to tax planning are considered to study the factors that influence it and can affect it (REZENDE; DALMÁCIO; RATHKE, 2019; SILVA, 2016). Thus, considering the Brazilian environment, there is an expectation of obtaining more robust results on tax aggressiveness through DVA (CHIACHIO; MARTINEZ, 2019).

2.2.1 Tax Aggressiveness and Earnings Management

Martinez (2017, p. 107) raises the question and premises for the opportunity of discoveries, that there are still many relevant gaps in the reality of Brazil that deserve more comprehensive investigations and research, regarding the consequences and determinants of tax aggressiveness. Among several gaps, this research brings the context of managerial incentives to study the elements that promote corporate tax aggressiveness.

Martinez and Almeida (2019, p. 62) state in their studies “that the conformity of accounting and tax profits influences earnings management, considering the latent power that profits have in restricting the opportunistic behavior of firms' corporate governance”.

Considering the existence of tax planning and the influence it has on the practice of tax aggressiveness through Value Added Tax Rates, this study looks for characteristics that possibly explain the levels of aggressiveness. Therefore, the second and third hypotheses of this research are defined as follows:

H2: When tested by the Value Added Tax Rates metric, it is expected that the higher the level of Earnings Management, the lower the firms' tax aggressiveness practices.

H3: Accounting conservatism, when moderate and controlled by firms' earnings management levels, affects aggressive tax practices.

3. METHODOLOGY

3.1 Sample Selection and Data Treatment

The aim of this research is to analyze the associations between tax aggressiveness and accounting conservatism, moderated and controlled by firms' earnings management practices.

The research sample consists of Brazilian non-financial companies listed on B3. This is an empirical study, with statistical processing using Stata® software, based on data published by

Economática®. Data was also extracted from the same companies to obtain the Value-Added Statements through the Finance and Risk Laboratory platform. - RiskFinLab®.

The period selected was from 2010 to 2019, which includes the mandatory adoption of International Financial Reporting Standards (IFRS) in Brazil. Although the enactment of Law no. 11. 638 (2007) has been required since the 2008 financial statements (MARQUES; NAKAO; COSTA, 2017), the years 2008 and 2009 were excluded because they were years in which IFRS adoption was partial through Accounting Pronouncements Committee 01 to 14 (DE SOUZA; DE SOUZA; DEMONIER, 2016), and also because during this period of harmonization of accounting standards, the Brazilian government created the RTT (Transition Tax Regime) mechanism to neutralize, via adjustments, the effects of the new accounting standards and procedures, (PASSAMANI; MARTINEZ; TEIXEIRA, 2012) impacting on the quality of accounting information, compared to subsequent years (DA SILVA FILHO et al., 2020). The main justification for using the period after the implementation of the IFRS in the sample of this research is because there is a higher quality of information in the financial statements, a greater degree of transparency, as well as less asymmetry of accounting information (SANTANA; KLANN, 2016).

3.2 Linear Regression Analysis

To analyze and test the research hypotheses, models were adapted from Givoly and Hayn (2002), Purwantini (2017), Silva (2016), Dechow, Sloan and Sweeney (1995), Ferreira et al. (2012), Martinez and Martins (2016) and Martinez and Passamani (2014), Martinez and Almeida (2019). It was also developed a multiple linear regression model for panel data with fixed effects of year and sector, as presented in the following topics.

To mitigate the occurrence of outliers and avoid bias in the analyses, the variables used in the regressions in this work were winsorized at 1% at each end of the distribution.

3.2.1 Conservatism and aggressiveness measured by TTVA

In order to test the hypotheses that correlate the level of tax aggressiveness and conservatism through TTVA, the model described below was used, with the aim of testing the literature that suggests influences of conservatism controlled by earnings management on the rate of taxation on added value.

$$TTVA_{i,t} = \beta_0 + \beta_1 Conservatism_{i,t} + \Sigma Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

The coefficient β_1 , represented by the independent variable Conservatism, calculated by the result of the regression of equation (2) of this research, thus identifying the degree of accounting conservatism for company i in time t .

Also, for the sake of robustness, tests were added with tax aggressiveness segregated between state and federal taxes, where TTVAESTAD represents the Value Added Tax Rate as a proxy for tax aggressiveness to measure state tax aggressiveness and TTVAFED as a proxy for tax aggressiveness to measure federal tax aggressiveness.

3.3 Definition of Variables

3.3.1 Independent Variables

To develop this research, three proxies were used to establish the relationships among them, the first being accounting conservatism, using the model proposed by Givoly and Hayn (2002) and used by Purwantini (2017), to measure the level of conservatism of companies. This model is justified to the extent that Basu's (1997) model is not applicable, considering the sample characteristics of this study, given that the data is annual (8 years per company) due to the variability of tax aggressiveness data, making it impossible to consistently calculate the of the aforementioned model for each firm, individually.

The Givoly and Hayn (2002) model, in addition to being validated by literature, allows tests to be conducted because of the way it measures conservatism. The model considers that the rate of accumulation of negative accruals is an indicator that there is a change in the degree of conservatism over time. In other words, accruals tend to be reversed when net income negatively exceeds operating cash flow in the long term. The consistent predominance of negative accruals for companies over a long period is an indication of conservatism (GIVOLY; HAYN, 2000).

$$Conservatism_{i,t} = \left(\frac{LAIR_{i,t} - FCO_{i,t}}{ATM_{i,t}} \right) \quad (2)$$

In which: $Conservatism_{i,t}$ represents the level of accounting conservatism of the company i in time t ; $LAIR_{i,t}$ represents the company's pre-tax profit (IRPJ and CSLL taxes) i in time t ; $FCO_{i,t}$ the Operating Cash Flow of company i at time t ; and $ATM_{i,t}$ the average total assets of company i at time t .

Conservatism is measured using accruals. If the accrual is negative, then the profit is classified as conservative, since the profit is less than the cash flow acquired (GIVOLY; HAYN, 2002). In this context, the equation that measures conservatism considers the relative value through the result of equation 2, indicating that the lower its result, the higher the firm's level of conservatism.

The second proxy to be used is Earnings Management. First, discretionary accruals will be calculated using the Modified Jones model (DECHOW; SLOAN; SWEENEY, 1995), which uses the variation in net revenues and fixed asset values, assuming that non-discretionary accruals depend on these variables to capture earnings management. As for discretionary accruals, they are

calculated through the difference between total accruals and non-discretionary accruals (FERREIRA et al., 2012; JONES, 1991)

The modified Jones model seeks to measure total discretionary accruals, both current and non-current, using the variables described by Dechow, Sloan and Sweeney (1995):

$$AT_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta RT_{i,t}}{A_{i,t-1}} \right) - \left(\frac{\Delta CR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{AP_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t-1} \quad (3)$$

In which: $AT_{i,t}$ represents the total accruals of company i in year t ; $A_{i,t-1}$ the total assets of company i in year $t-1$; $\Delta RT_{i,t}$ the variation in gross revenue of company i between years t and $t-1$, weighted by total assets at the end of period $t-1$; $\Delta CR_{i,t}$ the variation in accounts receivable (clients) of company i between years t and $t-1$, weighted by total assets at the end of period $t-1$; $AP_{i,t}$ the fixed assets (fixed, intangible and deferred) of company i in year t , weighted by total assets at the end of period $t-1$; and $\varepsilon_{i,t}$ the regression residual for company i in year t .

In addition, it should be noted that the earnings management proxy is being measured as a module, in order to capture the magnitude of earnings management, rather than its direction.

3.3.2 Presentation of the dependent variables

To measure tax aggressiveness, the Value-Added Taxation Rate (TTVA) variable will be used as a measure, by dividing the amounts distributed with taxes by the net value added, following the model by Silva (2016).

The dependent variable TTVA was used to represent the tax aggressiveness of company i at time t , adopting the same model used by Silva (2016), as described in the following equation:

$$TTVA_{i,t} = \frac{VAT_{i,t}}{VAL_{i,t}} \quad (4)$$

In which: $TTVA_{i,t}$ represents the Value Added Tax Rate as a proxy for tax aggressiveness; $VAT_{i,t}$ represents Value Added with Taxes; $VAL_{i,t}$ represents Net Value Added.

Thus, the interpretation of this indicator is that the lower the TTVA, the higher the company's level of aggressiveness, represented by the tax rate on added value.

3.3.3 Presentation of control variables

All the control variables used in the econometric models in the following sections are described below:

- **EM** residual: represents the residual from the regression of the modified Jones model to measure the level of earnings management, as described in equation 2 (FERREIRA et al., 2012);
- **LNAT**: natural logarithm of the total assets variable, whose purpose is to control the effect of company

size on the practices of conservatism and tax aggressiveness of companies (HAIDER; SINGH; SULTANA, 2021; FERREIRA et al., 2012);

- **CEM**: measured by the interaction between the gross result of equation 1 (the independent variable Conservatism) and the control variable EM residual, with the aim of expunging the effects of earnings management on accounting conservatism in a moderate way;
- **SALES**: natural logarithm of the company's total net revenues, the purpose of which is to control the effect of revenues on companies' aggressive tax practices (MARTINEZ; MARTINS, 2016);
- **INTANG**: Natural logarithm of intangible assets, with the aim of controlling the tax effects of tax incentives on intangible assets (HANLON; HEITZMAN, 2010).

4. ANALYSIS OF RESULTS

4.1 Descriptive Statistics

Table 1 (next page) shows the statistical behavior of the variables, in which TTVA shows a mean tax aggressiveness of 0.28 and a maximum of 0.82. Therefore, it is possible to state that the companies in the sample have an average tax burden of 28%, i.e. considering the provisions of Brazilian Federal Revenue Ruling (IN RFB) 1.700 of 2017, this burden is lower than the maximum tax rate on profit in Brazil, which can reach up to 34% for companies taxed using the Real Profit method. This statement is in line with the research by Dalfior (2015) corroborating that the lower the TTVA indicator, the more aggressive the company is in terms of taxation.

However, when it comes to the maximum burden, it must be taken into account that when using TTVA as an indicator of aggressiveness, it is also necessary to consider other taxes that are not only related to taxation on profit, such as PIS and COFINS (federal taxes) that together can reach up to 9.25% of turnover, ICMS which, depending on the state and the product sold, can exceed a rate of 25%, there is also ISSQN which, depending on the municipality, can exceed a rate of 5%, among others. This includes not only taxes related to profit, but also on the company's assets, salaries and revenue (SILVA, 2016).

Next, TTVAESTAD and TTVAFED, representing TTVA separately, which are the state and federal tax burdens respectively, show a mean of 0.08 for the state burden and 0.20 for the federal burden, showing that the average state tax burden of the companies analyzed is approximately 8% of turnover and the federal tax burden is 20%. Still on the subject of the federal tax burden, it must be considered that by extracting the tax burden data through the DVA, there are observations in the sample with losses, but which had federal taxation on revenue, so it can be seen that it is

Table 1 - descriptive statistics of the variables

VARIABLE	N	MEAN	D.P.	MIN.	Q.1	MEDIAN	Q.3	MAX.
TTVA	2223	0.28	0.20	0.00	0.15	0.26	0.38	0.82
TTVAESTAD	2340	0.08	0.13	0.00	0.00	0.01	0.12	0.55
TTVAFED	2232	0.20	0.16	0.00	0.11	0.19	0.27	1.13
CONSERVATISM	3928	-0.03	0.14	-0.64	-0.07	-0.02	0.03	0.38
GR	2836	0.07	0.08	0.00	0.02	0.05	0.09	0.47
LNAT	3928	14.09	2.80	3.69	12.75	14.57	15.87	20.34
CEM	2836	-0.00	0.03	-0.20	-0.00	-0.00	0.00	0.09
SALES	3230	13.64	2.24	6.19	12.46	13.87	15.15	18.24
INSTANG	3928	0.08	0.16	0.00	0.00	0.00	0.06	0.77

Source: Prepared by the author. **Note:** TTVA classified as a dependent variable indicating the tax burden on the total net value added of company *i* at time *t*; TTVAESTAD classified as a dependent variable indicating the state tax burden on the total net value added of company *i* at time *t*; TTVAFED classified as a dependent variable indicating the federal tax burden on the total net value added of company *i* at time *t*; CONSERVATISM (CONS) as an independent variable, assuming that the company is more conservative in the face of lower results; EM as an independent variable that indicates accruals management estimated by the Modified Jones model for company *i* at time *t*; CEM indicates the interaction between the independent variables CONSERVATISM and EM of company *i* at time *t*; SALES Total revenues of company *i* at time *t*; and INTANG represents the natural logarithm of intangible assets.

lower than the minimum burden on real profit, which is 24% and can reach up to 34% due to the progressivity of the IRPJ added to it (IN RFB 1.700, 2017).

The independent variable CONSERVATISM indicates that, as a mean, companies have practically neutral levels of conservatism (-0.03), with a standard deviation of 0.14, a minimum of -0.64 and a maximum of 0.38. Considering that the median is -0.02 and the third quartile is 0.03, it can be said that most of the companies in the sample have a greater tendency towards conservatism.

The independent variable EM showed a positive median of 0.05 and a mean of 0.07, indicating that, on average, the magnitude of management over the sample is 0.7. Analyzing up to the

third quartile, it can be seen that there is no great variance, as the indicators vary between 0.2 and 0.9. On the other hand, analyzing the maximum of 0.47 shows that even after winsorization, there are some companies that manage at levels much higher than the average.

4.2 Pearson Correlation Analysis

Table 2 shows the Pearson correlation. The indicators show a negative correlation between TTVA and accounting conservatism, initially indicating that accounting conservatism is inversely related to TTVA. This result suggests that more conservative

Table 2 - pearson correlation analysis

	TTVA	CONS	GR	LNAT	CEM	SALES	INTANG
TTVA	1						
CONS	-0.0621*	1					
GR	-0.0304***	-0.1570*	1				
LNAT	0.1248*	0.0762*	-0.2632*	1			
CEM	-0.0997*	0.8673*	-0.3451*	0.1536*	1		
SALES	0.1558*	0.1174*	-0.2512*	0.8232*	0.1554*	1	
INTANG	0.2147*	-0.0404**	-0.0951*	0.1703*	0.0134	0.2068	1

Note 1: CONS = CONSERVATISM

Note 2: ***, ** and * indicate that the coefficient is significant at 1%, 5% and 10%, respectively.

Source: Prepared by the author.

Table 3 - effect of accounting conservatism on tax aggressiveness

$$\text{Equation (1) Model A: } TTVA_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$$

$$\text{Equation (1) Model B: } TTVAESTAD_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$$

$$\text{Equation (1) Model C: } TTVAFED_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$$

	TTVA	TTVAESTAD	TTVAFED
CONS	-0.153838***	-0.1109093***	-0.1672437***
SALES	0.0188008***	0.0127837***	-0.0069419
LNAT	-0.0186565***	-0.0088275***	-0.0008315
INTANG	0.0780251**	0.0607888***	0.053182**
Sector Control	Yes	Yes	Yes
Fixed Time Effect	Yes	Yes	Yes
Number of observations	2.088	2.152	2.094

Source: Prepared by the author.

Note 1: ***, ** and * indicate that the coefficient is significant at 1%, 5% and 10%, respectively. **Note 2:** CONS represents the gross result of equation (2) for measuring Accounting Conservatism, from the model by Givoly and Hayn (2002) for company *i* in year *t*; SALES representing net revenues for company *i* in year *t*; LNAT as a measure of the size of company *i* in year *t*; INTANG as a measure of intangible assets *i* in year *t*.

companies tend to have significantly less aggressive tax practices when analyzed in isolation from other effects.

It is also shown that when EM is compared with the variable CCONSERVATISM (CONS), the correlation is negative, with a level of significance of 10%, suggesting that the greater the conservatism, the lower the earnings management tends to be.

The control variable LNAT shows a positive correlation in relation to TTVA and with a level of statistical significance of 10%, suggesting, preliminarily, that the smaller the size of the company, the less inclination there will be towards tax aggressiveness. The same applies to the control variables SALES and INTANG.

In the general context of the correlations presented, it can be seen that the main related variables have a statistically signi-

Table 4 – the effect of conservatism on tax aggressiveness

$$\text{Equation (1) Model A: } TTVA_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$$

$$\text{Equation (1) Model B: } TTVAESTAD_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$$

$$\text{Equation (1) Model C: } TTVAFED_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$$

	TTVA	TTVAESTAD	TTVAFED
CONS	-0.1454315***	-0.1218056***	-0.167984***
EM	0.0308051*	0.0906074***	0.1438545***
SALES	0.0201021***	0.0141801***	-0.0068848
LNAT	-0.0215048***	-0.0105885***	0.0001412
INTANG	0.0913467***	0.0642053***	0.0669167**
Sector Control	Yes	Yes	Yes
Fixed Time Effect	Yes	Yes	Yes
Number of observations	1.825	1.884	1.830

Source: Prepared by the author.

Note 1: ***, ** and * indicate that the coefficient is significant at 1%, 5% and 10%, respectively. **Note 2:** CONS represents the gross result of equation (2) for measuring Accounting Conservatism, of the Givoly and Hayn model (2002) for company *i* in year *t*; EM is the result of the regression of the modified Jones model, as a measure of earnings management for company *i* in year *t*; SALES representing net revenues for company *i* in year *t*; LNAT as a measure of the size of company *i* in year *t*; INTANG as a measure of intangible assets *i* in year *t*.

ficant level at 5%, with no correlations higher than 0.70, with the exception of the relationship between LNAT and SALES, which showed a high correlation, but no multicollinearity problems in the VIF test.

4.3 Results of Regressions

The following model seeks to analyze all the hypotheses of this research, which in turn seeks to analyze the relationship between tax aggressiveness, measured by TTVA, and segregated by the variables TTVAESTAD and TTVAFED, and the accounting conservatism of the companies analyzed.

The tests presented below were divided into three stages: i) the company's level of aggressiveness is tested using the independent variable CONS (Conservatism) and other control variables, without controlling conservatism for the effect of Earnings Management; ii) the company's level of tax aggressiveness is tested using the independent variable CONS (Conservatism) and other control variables, including the variable of EM (earnings management) to control the effect demonstrated in the literature regarding the influence that EM has on the level of conservatism of firms; and iii) the level of tax aggressiveness of companies is tested using the independent variable CONS (Conservatism) and other control variables, controlling for the effect of EM of companies and verifying the level of interaction between CONS and GR, represented by the variable CEM.

Table 5 – the effect of conservatism on tax aggressiveness

Equation (1) Model A: $TTVA_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$

Equation (1) Model B: $TTVAESTAD_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$

Equation (1) Model C: $TTVAFED_{i,t} = \beta_0 + \beta_1 \text{Conservatism}_{i,t} + \Sigma \text{controls}_{i,t} + \varepsilon_{i,t}$

	TTVA	TTVAESTAD	TTVAFED
CONS	0.053304	-0.0264603	-0.0404423
EM	-0.0270767	0.0596202***	0.1031848**
SALES	0.0193253***	0.0136702***	-0.0072297
LNAT	-0.0208255***	-0.0100855***	0.0004714
INTANG	0.093375***	0.065193***	0.0690601**
CEM	-0.9966144***	-0.4768948***	-0.6442191**
Sector Control	Yes	Yes	Yes
Fixed Time Effect	Yes	Yes	Yes
Number of observations	1.825	1.884	1.830

Source: Prepared by the author.

Note 1: ***, ** and * indicate that the coefficient is significant at 1%, 5% and 10%, respectively. **Note 2:** CONS represents the gross result of equation (2) for measuring Accounting Conservatism, from the Givoly and Hayn (2002) model for company i in year t; EM is the result of the regression of the modified Jones model, as a measure of earnings management for company i in year t; SALES represents net revenues for company i in year t. LNAT as a measure of the size of company i in year t; INTANG as a measure of intangible assets i in year t; CEM is the interaction of the CONS equation measured by the Givoly and Hayn (2002) model; LNAT as a measure of the size of company i in year t; INTANG as a measure of intangible assets i in year t; CEM is the interaction of the CONS equation measured by the Givoly and Hayn model (2002) and the residual of the earnings management regression (EM) by the modified Jones model, for company i in year t.

The negative coefficient of the CONS variable in the three regressions tested in Table 3 indicates that the levels of tax aggressiveness are significantly associated with the companies' levels of conservatism, and mainly corroborates the first hypothesis of this research, confirming that the higher the companies' levels of conservatism, the lower their levels of tax aggressiveness tend to be.

Table 4 below shows the results of the same test as above, controlling the effect that levels of Earnings Management (EM) can have on the level of aggressiveness of firms.

The tests support the previous results, considering that the CONS proxy remains significant and with a negative sign, considering the control of the effects of earnings management on companies' aggressive tax practices.

Analyzing the isolated effect of the EM proxy, we can see from the positive coefficient and significance that the regression results support the premise that corporate managers who use earnings management practices directly affect the level of tax aggressiveness when measured by the TTVA metric, looking from the perspective of the effect that conservatism has on tax aggressiveness and adding EM among the various controls, the results position companies in a less tax-aggressive way in the face of higher levels of earnings management, i.e. it is possible to state that companies can use earnings management to be more conservative, thus supporting the second hypothesis of this research.

Table 5 takes the tests a step further and considers both the effect of EM on aggressiveness and the moderating effect of EM on conservatism, through the interaction variable between levels of

EM and levels of conservatism, following the literature that points to a significant relationship between these two variables, such as Ferreira et al. (2012), Brummer (2017) and Martinez. (2017).

When the interaction of the main independent variables CONS and EM is added to the model, it can be seen that companies that manage their results more and remain conservative are less tax aggressive. Thus, it is not possible to reject the third hypothesis of this research, indicating that more conservative companies tend to have less aggressive practices, on average, even when the relationships are controlled and moderated by the levels of earnings management of the companies.

The results in Table 5 present an unprecedented context for Brazilian literature, suggesting that explaining tax aggressiveness only by CONS or EM becomes inefficient, because when the effects are moderated by the interaction of two constant variables, in this case represented by CEM, these control variables lose their significance in the model when analyzed separately, to the point that it makes no sense to analyze tax aggressiveness without considering both the effect of accounting conservatism and earnings management, given that EM has a relevant effect on conservatism.

These results are contrary to several studies, such as Marschner et al. (2019) and Ferreira et al. (2012), which show in their research that earnings management is positively related to tax aggressiveness, suggesting that companies that manage their results more tend to be more tax aggressive. These findings were evidenced by tests that used BTDA as a metric for tax aggressiveness, a metric which, despite being attractive, is a measure that originated in Europe and consequently came from a tax and accounting environment that is different from the reality in Brazil, which makes it less suitable for measuring the aggressiveness of Brazilian companies. (MARTINEZ; MOTTA, 2017).

5 FINAL CONSIDERATIONS

This research aimed to deepen and contribute to the discussion of variations in the level of Tax Planning of companies listed on B3, seeking to verify its relationship with the conservatism of

firms, controlling for the effect of earnings management. In view of this, Value Added Tax Rate - TTVA was adopted as the measure of tax aggressiveness, as it is a metric that represents greater effectiveness considering that it includes taxes from all government spheres in Brazil, including municipal, state and federal (SILVA, 2016; MARTINEZ; MOTTA, 2020). In addition, the Givoly and Hayn proxy was used as a measure of conservatism (2002).

These results are robust to the controls and moderation of the effects caused by earnings management practices, both in the levels of aggressiveness and in the levels of conservatism of the companies themselves, confirming the second and third hypotheses of this research. These results bring a new context to Brazilian literature, suggesting that explaining tax aggressiveness only by CONS or EM makes the analysis obsolete, given that when the effects are moderated by the interaction of two constant variables, as was the case with the independent variables CONS and GR, these variables lose their significance when analyzed separately, to the point that it makes no sense to analyze tax aggressiveness without considering both the effect of accounting conservatism and earnings management, given that EM has a relevant effect on accounting conservatism.

It was also possible to confirm through robustness tests that the associations between tax aggressiveness and conservatism are maintained even after segregating the types of taxes analyzed, by segregating TTVA into state taxes, using the TTVAES-TAD and TTVAFED metrics.

This research also demonstrates an advance in Brazilian literature in relation to tax studies. The expectation is that this study can be used in future research to improve, by applying new methodologies and improving the debates and discussions on the subject, and above all that these results and future results can contribute positively to the decision-making of Brazilian companies.

Future research aiming to investigate the effects and reasons for tax planning and management in Brazil could use the evidence obtained in this study, comparing, for example, the levels of significance according to the variability of governance levels and accounting conservatism, with the objective of enriching the Brazilian tax literature on debates and issues that have not yet been explored.

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