Do companies manage taxable and accounting earnings simultaneously in times of crisis?

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Abstract

Objective: This paper aims to investigate whether Brazilian companies are involved in earnings management and tax aggressiveness practices simultaneously in periods of economic crisis.

Method: The sample consisted of 2,301 observations from 142 non-financial companies with shares traded at the B3 stock exchange, between 1998 and 2019. Data was collected in the Economática® database.

Results: The findings show that, in periods of crisis, companies engage more in tax aggressiveness to improve cash flow and pay fewer taxes. In addition, companies manage more downward accounting results during crises, as the market tolerates poor financial performance in these periods. There is no evidence that companies engage in accounting earnings management and tax aggressiveness simultaneously in times of economic crisis since this maneuver increases the transaction cost or risk before regulatory bodies.

Contributions: The findings have practical implications for observing the regulatory bodies, that companies that adopt aggressive behavior in tax savings do not tend to manipulate their profits in the same period, a strategy possibly explained by the risk involved in the operations.

Keywords: Tax Aggressiveness; Earnings Management; Crisis

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Introduction

The literature presents an extensive range of evidence that companies are more likely to overestimate or underestimate their profits during economic crises. In times of economic slowing, the upward earnings management via discretionary accruals allows the manager to achieve goals, minimize the dispersion of earnings, avoid contract breaches, inflate pre-offer earnings, reduce the probability of business bankruptcy, obtaining gains against the market (Ball, Kothari & Robin, 2000; Ferreira et al., 2012; Dichev & Skinner, 2002; Burgstahler et. al, 1997 and 2006; Ayers et al, 2006; Ahmad-Zaluki et al, 2011; among others).

In another direction, the management of accounting earnings downwards in periods of economic crisis allows the manager to obtain concessions from creditors, political advantages or tax subsidies, exception treatment for new regulations, as well as the renegotiation of interest on debt with banks (Filip & Raffournier, 2014; Jones, 1991; Lim & Matolcsy, 1999; Navissi, 1999; Ahmed, Godfrey & Saleh, 2008; Asquith, Gertner & Scharfstein, 1994; DeFond & Jiambalvo, 1994; entre outros).

Additionally, there is international evidence that companies increase their levels of tax aggressiveness in times of recession (Shackelford & Shevlin, 2001; Richardson, Taylor & Lanis, 2015). By tax aggressiveness or downward management of taxable income, we mean a set of practices adopted to reduce the tax burden for the firm. This behavior is related to improved credit ratings, increased cash flow, access to financing for operations, and reduced risk of bankruptcy (Crabtree & Maher, 2009; Richardson, Taylor & Lanis, 2015; Ayers, Laplante & McGuire, 2010; Crabtree & Maher, 2009; Ayers, Laplante & McGuire, 2010). All these issues are associated with improving corporate results and increasing the company's ability to continue operating (Hackbarth, Miao & Morellec, 2006).

In this context, this research investigates whether Brazilian companies engage simultaneously in tax aggressiveness and earnings management via discretionary accruals in periods of economic crisis. We wondered whether the incentives for the management of accounting income and the management of taxable income are similar in periods of an economic crisis in Brazil. The Brazilian macroeconomic environment, historically unstable, allows the study of recessions through cycles of variation in the Gross Domestic Product (GDP), so that periods of decline are not rare events in the sample (Pires, 2014).

A recession in Brazil is understood as a persistent fall in GDP (Gomes & Magalhães, 2015; Chauvet, 2002) or abrupt variations in interbank deposit rates (Damasceno, 2018), both for two consecutive quarters, in movements estimated through a series of temporal or structural break tests. During periods of economic downturn, Brazilian firms can manage accounting results by increasing or decreasing operating results (Rosner, 2003; Deangelo, DeAngelo & Skinner, 1994), and manage taxable income by reducing fiscal accruals. as taxes payable (Goncharove & Zimmermann, 2006).

Linear regressions via ordinary least squares in panels with fixed effect per company, applied to a sample of 142 companies traded on Bolsa Brasil Balcão (B3), tested four research hypotheses: (i) In periods of economic crisis, Brazilian companies are more prone to the management of accounting earnings via discretionary accruals; (ii) In periods of economic crisis, Brazilian companies are more prone to managing taxable income or tax aggressiveness; (iii) Brazilian companies that manage taxable income downwards, becoming tax aggressive, are less likely to manage accounting income; and (iv) In periods of economic crisis, Brazilian companies do not tend to simultaneously manage their accounting earnings via discretionary accruals and their taxable earnings, given the risk of the transaction.

The tension over earnings management, taxable and/or accounting, resides in the last two research hypotheses. Through them, we investigate whether a relationship of complementarity exists between these two practices for all periods and specifically if it is more intense in years of economic crisis since a firm could simultaneously manipulate its accounting and taxable results, both downwards, during these periods, to maximize its market value and to recover more quickly than the competition.

However, there are reasons why Brazilian companies could also avoid the simultaneous practice of accounting and tax earnings management. Lennox, Lisowsky and Pittman (2013) and Erickson, Hanlon and Maydew (2004) argue that managing accounting earnings up and taxable earnings down in the same period (manipulating results in opposite directions) can raise suspicions in the tax authorities, in addition to being a risky and complex strategy. This is the gap that is intended to be filled in the literature on emerging markets such as Brazil.

Empirical tests to validate the fourth research hypothesis showed that, in periods of economic crisis, there is no

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evidence of a relationship — neither complementary nor substitute — between the management of accounting results and downward manipulation of taxable profits (tax aggressiveness), as the latter concept is measured by Book-Tax-Differences (BTD) and Effective Tax Rate (ETR). Thus, Brazilian companies do not simultaneously engage in practices aimed at reducing tax payments and managing accounting results, both in cases of underestimation of accounting earnings and in situations of overestimation of accounting earnings.

The initial tests pointed to the validity of the first research hypothesis, in line with Habib, Bhuiyan & Islam (2013), Saleh (2005), and Ahmad-Zaluki, Campbell & Goodacre (2011), based on the theory that in periods of recession companies are more inclined to manage their earnings downwards, as investors tolerate and anticipate in their expectations poor performance when the economy is bad. The validation of the second hypothesis corroborates Richardson, Taylor and Lanis (2015), Crabtree and Maher (2009) and Ayers, Laplante and McGuire (2010), because tax aggressiveness improves credit rating, cash flow, and access to financing, decisive aspects for the recovery or survival of companies immersed in a market in a stage of low economic productivity.

This study contributes in many ways to academics, investors, and professionals managing assets in emerging markets. To the Brazilian literature, the findings add evidence to the relationship between accounting and tax earnings management: Formigoni, Antunes, & Paulo (2009) did not find significant evidence for the relationship between discretionary accruals and the Book-Tax-Differences; Ferreira et al. (2012) investigated the association between earnings management and the same BTD, and found a directly proportional relationship; Martinez & Miiller (2016) pointed out that companies that manage their profits upwards are penalized with a credit rating downgrade when issuing debentures, while tax-aggressive companies are not penalized.

The research adds to Brazilian investors, professionals, and regulators, generating insights for the construction and enforcement of legislation to curb excessive profit manipulations. Brazil has complex tax legislation that applies to accounting, which makes the topic relevant. Changes in Brazilian corporate law to bring it closer to international accounting standards (Law 11,638/07 and 11,941/09) allowed greater flexibility in the measurement and disclosure of accounting information, which makes earnings management more favorable in this environment.

2. Theoretical References

2.1 Accounting profits management in times of crisis

The practice of earnings management can be influenced by internal factors (corporate governance, organizational culture, and internationalization) and external factors (economic freedom, human development, legal system, and audit quality). In this context, the economic crisis can be an external influencer on earnings management practices, mainly in the sense of further reducing earnings during these periods, when losses are more acceptable to investors (Ahmad-Zaluki, Campbell & Goodacre, 2011; Silva et al., 2014).

Thus, strong changes in the economic environment are expected to influence the company to manipulate profits (Filip & Raffournier, 2014). There is also evidence that the macroeconomic situation affects the quality of reported results and that profit relevance is sensitive to the business cycle (Johnson, 1999; Jenkins, Kane & Velury, 2009). These findings highlight the need for studies that explore the influences of macroeconomic conditions on earnings management practices (Filip & Raffournier, 2014).

Cimini (2015) investigated whether the subprime crisis in 2008 affected earnings management in the European Union through earnings management. The findings suggest that most European companies reduced earnings management after the crisis broke out, due to the increased level of monitoring by auditors. The 2008 crisis, therefore, increased the demand for high-quality reports with the presence of Big 4 auditing firms, reducing the incidence of earnings management (Francis, Hasan & Wu, 2013). In contrast, Agrawal and Chatterjee (2015) examined the relationship between earnings management and financial difficulties in Indian companies. The results indicate that companies with less difficulty are more involved in earnings manipulation and that companies with higher cash flow coverage have lower incentives to manage their earnings through discretionary accruals.

The two previous studies showed divergent results, indicating a lack of consensus in the literature. Additionally, in times of crisis, the market tolerates low performance, and managers end up taking advantage of it to reduce profits through accruals, allowing an increase in their post-crisis performance (Habib, Bhuiyan & Islam, 2013; Saleh, 2005; Ahmad-Zaluki, Campbell & Goodacre, 2011). Accruals can be non-discretionary (normal) or discretionary, which are those intended to manipulate accounting earnings (Dechow, Sloan & Sweeney, 1995). Thus, in emerging markets, where information asymmetry is more relevant, there are theoretical reasons why companies manipulate their discretionary

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accruals downwards in times of systemic economic stress.

H1: In periods of economic crisis, Brazilian companies are more prone to manage accounting earnings.

2.2 Taxable income management in times of crisis

Lennox, Lisowsky and Pittman (2013) found evidence that US companies that aggressively manage their taxes are less likely to manage their accounting results. Thus, according to the authors, an overestimation of accounting income and a reduction in taxable income, both done simultaneously, can allow managers to deny shareholders the fair share they have in the company's profits. Furthermore, companies that manage earnings upwards, on average, do not engage in aggressive tax positions because of the risk of reporting high accounting earnings and low taxable earnings simultaneously, and extreme types of earnings management are not associated with increased aggressiveness taxation (Erickson, Hanlon & Maydew, 2004).

The Book-Tax Difference (BTD), a proxy widely used in the literature for tax aggressiveness, can be caused both by differences between accounting and tax rules (normal NBTD) and by opportunistic choices made by the discretionary judgment of managers on taxable income or income accounting (abnormal ABTD), to meet the interests of shareholders or managers themselves, especially to reduce the tax burden of companies (Tang & Firth, 2011; Formigoni, Antunes & Paulo, 2009).

Some common incentives for earnings management and tax aggressiveness may be related to lowering the tax burden (Richardson, Taylor & Lanis, 2015), increasing cash flow, financing operations, and reducing the risk of bankruptcy (Crabtree & Lanis, 2015). Maher, 2009; Ayers, Laplante & McGuire, 2010). Goncharove and Zimmermann (2006) concluded in their study that publicly traded companies manage their profits downwards to pay fewer income taxes. In this sense, since the incentives for managing the accounting result and the taxable result seem similar, it is asked whether these activities are carried out simultaneously by B3 companies, especially in periods of economic crisis.

It is expected that companies that aggressively manage their taxes are not likely to manage their accounting results simultaneously in a period of economic crisis, since this maneuver would increase exposure to the risk of monitoring by regulatory agencies such as the Securities and Exchange Commission (equivalent to the American SEC) and the Internal Revenue Service (US IRS), in addition to being a complex choice from a tax and accounting point of view (Erickson,

Hanlon & Maydew, 2004).

H3: Brazilian companies that are more tax aggressive are more likely to manage accounting results via discretionary accruals.

H4: Brazilian companies that are less tax aggressive are not more likely to manage accounting results in times of economic crisis, since the crisis raises the costs/risks of these activities.

3. Research Methodology

3.1 Data sample and collection

To test the proposed hypotheses, we collected a sample composed of companies with shares listed on B3 (Brasil, Bolsa and Balcão), from 1998 to 2019. The collection of these secondary data was carried out through the Economática® database. The year 1997 was used only as a basis to calculate the variations of some variables of the models (eg, Total Revenue in the previous period) concerning 1998. The initial database has a total of 7,986 observations of common stocks-year of 363 companies between 1998 and 2019.
The exclusion of data from the initial base came from (i) removal of observations that had total assets less than or equal to zero (3 observations); (ii) removal of missing values from the model's accounting variables (4,544 fewer observations); (iii) removal of missing values to calculate the Z-Score and financial reasons present in the model (1,138 fewer observations). The final sample contains 142 non-financial companies in 2,301 firm-year observations.

3.2 Variables description

Accounting Income Management. Earnings Management (GR) is measured by the residuals of the Modified Jones model, which measures the total of discretionary accruals — non-current and current (Dechow, Sloan & Sweeney, 1995) as shown below. The model predicts the estimation of the betas (coefficients) of the linear regression below (equation 1) for each year of the sample and, then, the calculation of the estimated residuals for each company in time.

$$TA_{it}=\beta_{0i}+\alpha_i\,[1/A_{it-1}]+[\beta_{1i}\,(\Delta REV_{it}-\Delta REC_{it})+\beta_{2i}\,(PPE_{it})]/A_{it-1}+\varepsilon_{it} \quad (1)$$

Where TA_{it} = accrual basis adjustments or total accruals of firm i in year t; ΔREV_{it}= variation in gross revenues between the current year and the previous year of firm i, weighted by the total assets of the previous year; ΔREC_{it}= variation in accounts receivable (customers receivable) between the current and previous years of firm i, weighted by total assets at the end of

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the previous period; PPE_{it}= sum of fixed and intangible assets for the current year of firm i, weighted by the total assets at the end of the previous year A_{it-1}= total assets of company i in the previous year.

To calculate the Total Accruals (TA), a dependent variable of linear regression (1), the equation 2 described below was used:

$$TA_{it}=[(\Delta AC_{it}-\Delta Dispit)-[(\Delta PC_{it}-\Delta Divit)- Deprit]/A_{it-1} (2)$$

Where ΔAC^{it} represents the change in current assets of company i from the previous year to the end of the current period; $\Delta Disp^{it}$ is the change in company i's cash at the end of the previous year to the end of the current year; ΔPC^{it} is the change in current liabilities of company i from the end of the previous period to the end of the current period; ΔDiv_{it} is the variation of company i's short-term financing and loans from the end of the previous year to the end of the current year; Deprit is the total amortization and depreciation expenses of company i during the current period; e ΔAT_{it-1} is the total assets of firm i in the previous year.

Until 2008, total accruals were calculated based on the Balance Sheet approach described previously. According to Jones (1991, p. 207), discretionary accruals are based on the difference between total accruals and non-discretionary accruals. After 2008, with the enactment of Law 11,638/07, total accruals began to be calculated using the cash flow methodology (Net Income – Cash Flow from Operations), since, from that year onwards, companies to be required to present the Cash Flow Statement (Martinez, 2013).

To verify the effect of the crisis in different earnings management scenarios, the variable GR (Modified Jones model) was calculated in three ways: (i) **General management**, which represents the absolute value of discretionary accruals according to the Modified Jones model; (ii) **Negative or downward management**, which represents the absolute value of discretionary accruals according to the Modified Jones model, only when discretionary accruals are negative; and (iii) **Positive or upward management**, which represents the absolute value of discretionary accruals according to the Modified Jones model, only when discretionary accruals are positive or null.

Management of taxable income. Tax aggressiveness was measured using the Book-TaxDifference (BTD) proxy, calculated from the difference between taxable income following tax legislation, and accounting income following Generally Accepted Accounting Principles (GAAP). This difference exists precisely because of the differences in the calculation criteria

determined by corporate and tax laws (Ferreira et al., 2012). To calculate the BTD, the equation below is used:

$$BTD_{it}=LAIR_{it}- Provisão IR e CSLL_{it}/0,34 (3)$$

Where LAIR is Profit Before IRPJ/CSLL; IRPJ/CSLL Provision is Real Income, calculated from the provision for IR/CSLL; 0.34 is the nominal tax rate (Ferreira et al., 2012). After calculation, BTD was divided by total assets.

The Effective Tax Rate (ETR) is an alternative proxy for tax aggressiveness. The measure represents the division of the provision for IRPJ and CSLL by the LAIR subtracted from the equity income.

Economic crisis. To identify periods of crisis, this article followed economic papers (Gomes & Magalhães, 2015; Chauvet & Morais, 2010; Chauvet, 2002; Pires, 2014; Damasceno, 2018) that evidence periods of economic recession in Brazil through studies of economic cycles. The mentioned works point to the years 1998, 2001, 2003, 2008, 2009, 2013, 2014, 2015, 2016, and 2017 as crisis periods. Dummy variables assumed value "1" for crisis periods and "0" for noncrisis periods.

Control variables. The following control variables were also used, listed in the literature dealing with accounting earnings management:

(i) ROA = Return on Assets before taxes, as, on average, companies with low-profit margins resort more to earnings management (Agrawal & Chatterjee, 2015);
(ii) Company leverage, measured by the ratio between long-term debt and total assets, because more leveraged companies manage more earnings to avoid breaches of debt obligations;
(iii) Market-to-book, to capture companies' growth opportunities, a measure that may be related to earnings management (Charitou, Lambertides & Trigeorgis, 2007; Habib, Bhuiyan & Islam, 2013);
(iv) Size, natural log of total assets for the company, since larger companies are more concerned with their reputation if earnings management is detected (Habib, Bhuiyan & Islam, 2013; Agrawal & Chatterjee, 2015);
(v) Z-Score, to measure the periods in which companies experienced financial difficulties according to the modified Altman Z Score. This model is calculated by the following equation: Z = [1.2 (working capital divided by total assets) + 1.4 (retained earnings divided by total assets) + 3.3 (earnings before interest and taxes divided by total assets) + 0.999 (sales divided by total assets)] * (-1). The higher the indicator, the greater the financial

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difficulty (Richardson, Taylor & Lanis, 2015);

(vi) Fixed assets, which measure the degree of immobilization of the asset (fixed assets divided by the total assets of the previous year). It is a measure of more capital-intensive companies, because companies with more fixed assets have different rates of depreciation, which are discretionary expenses. Therefore, this choice can affect earnings management (Han & Wang, 1998; Filip & Raffournier, 2014);

(vii) Loss, a dummy variable that assumes 1 for companies with a loss and 0 for companies with a profit, as companies with losses have different incentives than companies that do not have losses in terms of earnings management (Ferreira et al., 2012).

3.3 Research Design

MODEL 1: Management of accounting results in periods of crisis.
Hypothesis 1 was tested from the specification below. For the hypothesis "In periods of economic crisis, Brazilian companies are more likely to manage accounting earnings" to be validated, coefficient β_1 must be positive and statistically significant. It was also verified, on average, if this effect is maintained for different directions of management of accounting results.

$$GR_{it} = \beta_0 + \beta_1 \, DummyCrisis_{it} + \sum\beta_k \, Controls_{it} + \varepsilon_{it} \text{ (MODEL 1)}$$

MODEL 2: Tax aggressiveness or management of taxable profits in times of crisis.
Hypothesis 2 was tested from the specification below. For the hypothesis "In periods of economic crisis, Brazilian companies are more prone to managing taxable profits or tax aggressiveness" to be validated, coefficient β_1 must be positive and statistically significant.

$$BTD_{it} = \beta_0 + \beta_1 \, DummyCrisis_{it} + \sum\beta_k Controls_{it} + \varepsilon_{it} \text{ (MODEL 2)}$$

MODEL 3: Simultaneous management of accounting and tax results.
Hypothesis 3 was tested from the specification below. For the hypothesis "Brazilian companies less tax aggressive are more likely to manage accounting results" to be validated, coefficient β_1 must be positive and statistically significant, especially for the subsample in which discretionary accruals are negative (always measured in absolute value for linear regression purposes).

$$GR_{it} = \beta_0 + \beta_1 BTD_{it} + \sum\beta_k \, Controls_{it} + \varepsilon_{it} \text{ (MODEL 3)}$$

MODEL 4: Simultaneous management of accounting and tax results in periods of economic crisis.
Hypothesis 4 was tested from the specification below. For the hypothesis "Brazilian companies less tax aggressive are not more

likely to manage accounting results in times of economic crisis" to be validated, we expect the coefficient β_2 to be statistically insignificant. The expected "non-result" signals that there is no evidence of simultaneity between the two tax and accounting management practices in periods of crisis.

$$GR_{it} = \beta_0 + \beta_1 BTD_{it} + \beta_2 BTD_{it} * DummyCrisis_{it} + \beta_3 DummyCrisis_{it} + \sum\beta_k \, Controls_{it} + \varepsilon_{it} \text{ (MODEL 4)}$$

4. Results and analyses

To calculate the regressions, the variables obtained between the years 1998 to 2019 were winsorized at 2.5% of the sample at each end in the variables GR, BTD, Z-Score, ROA, Leverage, Market-to-Book, Fixed Assets, and Size. The Modified Jones model variables were also winsorized at the same rate. Winsorization was performed at 2.5% given the high presence of outliers in the distribution of the Market-to-Book variable. Table 1 shows the descriptive statistics of the variables from models 1 to 4, described in the methodology.

Table 1: Descriptive statistics

This table presents the descriptive statistics of the variables containing means, standard deviation, quartile 1, median, and quartile 3 of the model variables, totaling 2,301 observations from 142 companies listed on B3 S/A in the period from 1998 to 2019. The variables were winsorized at 2.5%. See definitions of variables in the methodology. Panel A brings characteristics of the distributions of the variables Book-Tax-Differences and accounting controls; panel B shows the moments of the distributions of the management of accounting results via discretionary accruals: general GR; GR in module; GR negative and GR positive or null.

Panel A: Tax Aggressiveness and Control Variables

	Mean	Standard deviation	Quartile 1	Median	Quartile 3
BTD	-0.048	0.345	-0.022	0.007	0.037
ETR	0.197	0.378	0.001	0.212	0.328
ROA	-0.018	0.352	-0.018	0.031	0.087
Leverage	0.411	0.461	0.16	0.333	0.498
Market-to-Book	0.629	2.019	0.001	0.002	0.017
Size	14.31	1.933	13.326	14.412	15.532
Z-Score	-0.805	1.773	-1.502	-0.952	-0.472
Crisis	0.497	0.5	0	0	1
Fixed	0.293	0.271	0.036	0.24	0.458
Loss	0.317	0.466	0	0	1
N	2,301 observations				

Panel B: Earnings Management (Modified Jones Model)

	Mean	Standard deviation	Quartile 1	Median	Quartile 3
GR	-0.024	1.021	-0.332	-0.096	0
GR in module	0.353	0.958	0.004	0.174	0.364
N	2,301 observations				
GR negative	-0.255	0.259	-0.386	-0.236	-0.03
N	1,699 observations				
GR positive or null	0.629	1.794	0.001	0.011	0.161
N	602 observations				

Table 2, below, presents the regression results of model (1) used to verify whether companies in periods of crisis manage their accounting results more via discretionary accruals.

Tabela 2: Accounting Earnings Management in times of crisis

This table presents the results of the Regression Model (1) that tests whether companies in times of crisis engage in earnings management. GR is the dependent variable that measures earnings management by the Modified Jones model, always calculated in absolute value; Dummycrisis (0 - crisis; 1 - no crisis) is the variable of interest; and ROA (return on assets), Leverage, Market-to-book, Size, Z-Score, Loss and Fixed Assets are the control variables. The variables were winsorized at 2.5%. *, ** and *** represent 10%, 5% and 1% of statistical significance, respectively. The numbers in bold show p-values that signal the significance of the coefficients at 1% or 5%. The GR General column constitutes the sample whose Modified Jones model is presented in absolute values; column GR<0 is the sample that contains only negative discretionary accruals; the column GR>=0 shows the sample that contains only positive discretionary accruals.

Result Management (GR)	GR (Geral)		GR < 0		GR >= 0	
	Coef.	value-P	Coef.	value-P	Coef.	value-P
Crisis dummy	0.10***	0.000	0.11***	0.000	-0.03	0.743
ROA	-0.43*	0.092	0.01	0.957	-0.44	0.258
Leverage	0.30***	0.000	0.07*	0.079	0.46***	0.001
Market-to-Book	-0.06***	0.004	-0.02***	0.000	-0.15**	0.033
Size	0.08**	0.036	0.03	0.131	0.08	0.319
Z-Score	0.03	0.682	-0.02	0.299	0.05	0.612
Loss	-0.11**	0.024	0.00	0.935	-0.24*	0.096
Fixed	-0.15	0.314	-0.19***	0.000	-0.11	0.832
Constant	-0.88	0.118	-0.19	0.466	-0.52	0.666
R-Square	0.09		0.132		0.123	
F-Test	10.9		17.12		4.02	
Akaike Criterion (AIC)	4,090		-1,055		1,585	
N	2,301		1,699		602	

*** p<0.01, ** p<0.05, * p<0.1

According to the regression results presented in Table 2, there is evidence that companies manage more results via discretionary accruals in periods of economic crisis. The coefficient was positive and significant at 1% in the regressions with general management and with downward management (negative accruals subsample). On the other hand, the regression that uses upward accounting earnings management as the dependent variable did not show a statistically significant coefficient. This result supports the argument that, in times of crisis, the market tolerates low performance and managers end up reducing profits through accruals, allowing an increase in post-crisis performance (Habib, Bhuiyan & Islam, 2013; Silva et al., 2014; Saleh, 2005; Ahmad-Zaluki, Campbell & Goodacre, 2011).

Table 3, below, presents the regression results of model (2) used to verify whether companies in periods of economic crisis are

more tax aggressive when fiscal aggressiveness is measured by the Book-Tax-Differences, a measure that captures the difference between accounting and taxable income.

Table 3: Taxable Earnings Management in times of crisis

This table presents the results of the Regression Model (2) that tests whether companies in times of crisis engage in managing taxable income measured by Book-Tax-Differences (BTD). Crisis dummy (0 - crisis; 1 - no crisis) is the variable of interest; and ROA (return on assets), Leverage, Market-to-book, Size, Z-Score, Loss, and Fixed Assets are the control variables. The variables were winsorized at 2.5%. *, ** and *** represent 10%, 5% and 1% of statistical significance, respectively. The numbers in bold show p-values that signal the significance of the coefficients at 1% or 5%.

	BTD	
	Coef.	Value-P
Crisis dummy	0.005**	0.019
ROA	0.993**	0.000
Leverage	-0.007**	0.046
Market-to-Book	0.001	0.137
Size	0.006**	0.032
Z-Score	0.007**	0.011
Loss	0.029***	0.000
Fixed	0.000	0.963
Constant	-0.121***	0.004
R-Square	0.94	
F-Test	1,239	
Akaike Criterion (AIC)	-7,579	
N	2,301	

*** p<0.01, ** p<0.05, * p<0.1

According to the regression results presented in Table 3, the hypothesis that companies are more tax aggressive in times of crisis was partially satisfied, as coefficient β_1 presented a positive and significant result at 1% only when tax aggressiveness is measured by the BTD. For the BTD, the findings corroborate the arguments that although there are costs for tax aggressiveness, such as fines arising from audit notices and costs related to the company's reputation (Richardson, Taylor & Lanis, 2015), on average, companies in periods of economic crisis tend to be more tax aggressive. When the advantages of avoiding taxes, such as reducing the tax burden and improving operating cash (Chen & Lai, 2012) are greater than the costs (Shackelford & Shevlin, 2001), this alternative seems viable to companies.

Table 4, below, presents the regression results of the model (3) used to verify if the more tax aggressive companies are more likely to manage their accounting results. The regression below seeks to test whether there is simultaneity in the decision made by the firm between the management of accounting income and taxable income, for the entire sample period.

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Table 4: Simultaneous management of Accounting and Tax Earnings

This table presents the results of the Regression Model (4) which shows whether companies engage in EM and AT simultaneously. GR is the dependent variable (measures earnings management by the Modified Jones model in absolute values); BTD (Book-Tax Difference) or ETR (Effective Tax Rate) measures tax aggressiveness and are the variables of interest; and ROA (return on assets), Leverage, Market-to-book, Size, Z-Score, Loss and Fixed Assets are the control variables. The variables were winsorized at 2.5%. *, ** and *** represent 10%, 5% and 1% of statistical significance, respectively. The numbers in bold show p-values that signal the significance of the coefficients at 1% or 5%. The GR General column constitutes the sample whose Modified Jones model is presented in absolute values; column GR<0 is the sample that contains only negative discretionary accruals; the column GR>=0 shows the sample that contains only positive discretionary accruals.

Panel 1: Tax Aggressiveness measured by the BTD

GR	GR (General)		GR < 0		GR >= 0	
	Coef.	P-value	Coef.	P-value	Coef.	P-value
BTD	-0.852**	0.014	-0.004	0.987	-1.008**	0.013
BTD*Crisis	**-0.131**	**0.493**	**-0.087**	**0.547**	**-0.299**	**0.351**
Crisis dummy		0.000	0.105***	0.000	-0.071	0.374
ROA	0.485	0.257	0.084	0.732	0.67	0.229
Leverage	0.291***	0.000	0.072	0.084	0.436***	0.000
Market-to-Book	-0.057***	0.005	-0.018***	0.000	-0.148**	0.031
Size	0.091**	0.018	0.029	0.127	0.097	0.216
Z-Score	0.029	0.689	-0.023	0.300	0.041	0.689
Loss	-0.079	0.102	0.007	0.763	-0.187	0.200
Fixed	-0.135	0.338	-0.184***	0.000	-0.026	0.958
	-1.026*	0.059	-0.211	0.438	-0.78	0.490
R-Square	0.091		0.255		0.132	
	5.611		13.7		4.4	
Akaike Criterion (AIC)	4,090		-1,054		1,581	
N	2,301		1,699		602	

Panel 2: Tax Aggressiveness measured by the ETR

GR	GR (General)		GR < 0		GR >= 0	
	Coef.	P-value	Coef.	P-value	Coef.	P-value
ETR	0.152*	0.051	-0.002	0.931	0.408**	0.036
ETR*Crisis	**-0.224***	**0.074**	**0.004**	**0.887**	**-0.454**	**0.277**
Crisis dummy		0.000	0.105***	0.000	0.056	0.587
ROA	-0.426*	0.092	0.01	0.958	-0.443	0.251
Leverage	0.302***	0.000	0.072*	0.080	0.492***	0.000
Market-to-Book	-0.058***	0.004	-0.018***	0.000	-0.141**	0.033
Size	0.085**	0.037	0.028	0.130	0.078	0.350
Z-Score	0.029	0.674	-0.022	0.299	0.057	0.558
Loss	-0.102**	0.036	0.002	0.936	-0.211	0.152
Fixed	-0.144	0.321	-0.186***	0.000	-0.133	0.795
Constant	-0.937	0.110	-0.188	0.468	-0.555	0.646
R-Square	0.085		0.132		0.131	
F-Test	7.6		13.9		3.54	
Akaike Criterion (AIC)	4,103		-1,051		1,579	
N	2,301		1,699		602	

The regression results presented in Table 4 validate the hypothesis of the non-existence of simultaneous tax and accounting management in periods of crisis. This suggests the lack of complementarity between the two types of earnings management (coefficient of interaction between ETR and crisis — BTD and crisis — was statistically insignificant). These results corroborate the arguments that companies that aggressively manage their taxes are not likely to manage their accounting results simultaneously in a period of crisis, since this maneuver would increase the risk/cost of the transaction monitored by regulatory agencies such as the Securities and Exchange Commission (equivalent to the SEC — Securities Exchange Commission in the United States) and the Internal Revenue Service (equivalent to the American IRS), in addition to being a complex choice (Erickson, Hanlon & Maydew, 2004).

5. Final Considerations

This work sought to explain the behavior of companies during economic crises concerning the management of taxable and accounting profits. The tests showed that aggressive tax activities and earnings management via discretionary accruals do not occur simultaneously in periods of economic crisis, given the regulatory risk of this choice. Additionally, the results showed that the direction of accounting earnings management matters, signaling that negative discretionary accruals are more common in times of economic crisis, in a sample of Brazilian companies traded on B3.

The limitations of this study reside, in part, in the reverse causality bias verified specifically in the theory that relates tax aggressiveness and earnings management at the level of abnormal accruals. The high R-Square of the specification used by hypothesis 2 signals the endogeneity of the model. The correction of this methodology remains a suggestion for future research.

In addition, like any residual-based estimation model, the Modified Jones model captures erratic events not necessarily related to the concept to be measured in isolation (discretionary accruals). The estimation of residuals was based on annual betas since the Brazilian stock exchange represents sectors with the high market concentration and with few companies of different sizes in negotiation.

Another important point to be considered is the ability to reverse discretionary accruals, not considered in the scope of this research. Accrual basis adjustments were not broken down into temporary and non-temporary, and management timing can impact companies' accounting policies.

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However, the results are considered useful and relevant to explain the accounting and tax behavior of companies during economic crises, since they can guide decisions by investors and supervisory bodies.

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