

Audit fees and Book-Tax Differences

Honorários de auditoria e Book-Tax Differences

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Abstract

Differences between book and taxable income, internationally denominated Book-Tax Differences (BTD), can affect auditor's risks and efforts, raising audit fees. Thus, this article aims research is to verify if there is a relationship between the BTD types and the audit fees that were paid by the Brazilian public companies in the period from 2010 to 2014. Different from the international studies, only positive BTD (book income greater than the taxable income) was related to audit fees. The higher level of earnings management and tax evasion, which generate positive BTD, historically present in civil law countries may justify this difference in results regarding other observed countries. Positive BTD can represent a "red flag" for auditors, investors, analysts and regulators to assess the quality of accounting information. The article argues the relevance of enhance the analysis of audit fees and types of BTD, in different economic activities and countries' legal origin.

Resumo

As diferenças entre o lucro contábil e o lucro tributável, denominadas internacionalmente de Book-Tax Differences (BTD), podem aumentar os riscos e esforços do auditor, elevando os honorários da auditoria. A pesquisa verifica se existe relação entre os tipos de BTD e os honorários de auditoria que foram pagos pelas companhias abertas brasileiras no período de 2010 a 2014. Diferente dos estudos internacionais, apenas a BTD positiva (lucro contábil maior que o lucro tributável) apresentou relação com os honorários. O maior gerenciamento de resultados e evasão fiscal, que geram a BTD positiva, historicamente presentes em países civil law, podem justificar essa diferença de resultados em relação a outros países em que os efeitos foram testados. A BTD positiva pode representar uma "bandeira vermelha" para auditores, investidores, analistas e reguladores avaliarem a qualidade das informações contábeis. Discute-se a relevância de aprofundar a análise de como os honorários de auditoria variam com os diversos tipos de BTD, em diferentes setores de atividade e origens legais de países.

Practical implications

Differences between book and taxable income can increase auditor's risk of financial loss and reputation damage, affecting audit fees. The difference between these two incomes, known as Book-Tax Differences (BTD), is a 'red flag' for analysts, managers, and government, of possible earnings management and tax evasion.

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1 INTRODUCTION

The pricing of audit work should cover risks assumed by auditors and the possibility of losses for these professionals (Gul, Chen & Tsui, 2003; Oliveira, Souza & Vieira, 2004). Hanlon, Krishnan and Mills (2012) suggest that the Book-Tax Differences (BTD), difference between book income (BI) and taxable income (TI), can be one of the factors capable of creating additional complexity to the auditor's work and increase the risks resulting from problems on the quality of accounting information, having influence on the audit fees determination.

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Responsible subjectivism and the accounting choices inherent in the adoption of the International Financial Reporting Standards (IFRS) may be related with the management of accounting and fiscal result, which can affect BTM values (Barth, Landsman & Lang, 2008, Hanlon *et al.*, 2012). Opportunistic behavior degrades the quality of the accounting information (Iudicibus, Martins & Carvalho, 2005) and increases the risk and the complexity perceived by the auditor, which will tend to reflect these aspects when pricing services (Heltzer & Shelton, 2011). In this context, Hanlon *et al.* (2012) found that extreme BTM values may indicate the manager's discretion for profit maximization, which influences the risk perceived by the auditor about the quality of profit and fees determination.

The possibility of the BTM being a result from discretionary accounting choices of managers and, in some way, affect the quality of the information may lead auditors to consider greater efforts, risks, and complexity in the execution of activities, affecting the planning of the work to be performed (Hribar, Kravet & Wilson, 2014). The impacts on planning can be translated by the dedication of more working hours (or raise in cost per hour), by the hiring of more specialized professionals, and by the application of more robust audit tests (Bedard & Johnstone, 2004), factors which may affect the pricing of this service.

In this context, the article discusses the relationship between the types of BTM and the audit fees paid by listed companies in Brazil, therefore in a country of civil law origin. Specifically, the objective of this study is to determine if the various types of BTM affect the audit fees that have been paid by Brazilian listed companies. The sample of this study consists of 246 Brazilian listed companies that traded shares in the Bovespa Securities, Commodities and Futures Exchange (BM&FBovespa) from 2010 to 2014.

Hanlon *et al.* (2012) analyzing listed companies of the United States, country of common law origin, found that total, permanent, and temporary BTM are associated with the assessment of auditor's risk and effort; and can raise audit fees. Martinez & Lessa (2014) found that total BTM is associated with the fees for Brazilian listed companies. This research differs from Hanlon *et al.* (2012) and Martinez & Lessa (2014), because it analyzes the issue in a country of civil law origin such as Brazil, and also tests BTM by its types: temporary, permanent, normal, abnormal, positive, and negative.

The history of greater association between fiscal and corporate norms and lower BTM in the Brazilian case may have changed after the adoption of the IFRS (Iudicibus *et al.*, 2005, Costa & Lopes, 2015). However, Jeanjean and Stolowy (2008) assert that the adoption of the IFRS in countries of civil law origin boosted the practice of earnings management. Klann and Beuren (2011) found that there was reduction in the levels of earnings management in English companies with the adoption of the IFRS and increase in Brazilian companies after this adoption. Therefore, it is expected that the adoption of the IFRS in civil law countries, such as Brazil, have influenced the auditors' perception about the BTM in accounting information and that they pondered their risks and priced their remuneration accordingly.

Going beyond Hanlon *et al.* (2012), the analysis in this research includes normal, abnormal, positive, and negative BTM; this may bring greater robustness to the results. Hanlon *et al.* (2012) conjecture that extreme BTM values may be related to higher risk and audit fees due to earnings management. However, these authors did not test the relationship between audit fees and abnormal BTM and positive BTM, which are derived from accounting and fiscal earnings management. This research advances testing such relations.

Considering that it is still undetermined if BTM is related with audit fees in civil law countries, this study seeks to contribute to the construction of the theoretical framework that presents BTM as proxy for auditor's risk, complexity, and effort, factors which have influence on audit work pricing. The results of this research may be useful for auditors to assess how BTM can assist in determining audit fees, as well as for analysts to assess the usefulness of BTM in risk assessment.

2 LITERATURE REVIEW

2.1 Relationship between types of BTM and audit fees

According to its source, BTM can be divided into normal and abnormal; according to its nature, into permanent and temporary; and according to its magnitude, into positive and negative. Analyzing BTM separately according to type is relevant, since some of these types can be more related to factors that reduce the quality of accounting information, such as, for example, conservatism and persistence of results.

BTM can emerge specifically from the difference between accounting and fiscal norms, resulting in normal BTM, and from discretionary manipulations on book income (BI) and taxable income (TI), thus resulting in abnormal BTM (Tang, 2005a, 2006).

The limitation of the tax results measurement criteria, as well as the difference of objective considering the corporate norm, can cause that, from a same business operation, different results are extracted (Mills, Newberry, & Trautman, 2002). This occurs due to the fact that the IFRS enable greater diversity of accounting choices, allowing the managers the option of using the methods that are more suited to the company's economic and financial reality, which, sometimes, differs from the interests of the Treasury (Costa & Lopes, 2015).

On the other hand, abnormal BTM results from opportunistic behavior of managers, defined by earnings management (EM) and tax management (TM) (Tang, 2005b). Tang (2005b) also argues that EM and TM can occur simultaneously, case in which the manager manipulates both BI as TI, maintaining none of them constant. Thus, analysis of abnormal BTM is hampered, mainly, by lack of proper measure to measure EM and TM and by confidentiality of tax information (Formigoni, Antunes & Paulo, 2009). These factors increase the complexity for the auditor to determine the origin of the abnormal BTM, demanding extra effort and increasing the risks involved, which can raise the required fees (Hanlon *et al.*, 2012).

Permanent BTM is that which will never be equalized between corporate and fiscal norms due to resulting from the recognition of values that are registered only under the supervision of one of the norms (Tang, 2005a, 2006). There is evidence that permanent BTM is strongly associated with uncertainties of market participants about the future performance of businesses, which is an indication that they are potential risk factors for companies (Comprix, Graham Jr., & Moore, 2011). Hanlon *et al.* (2012) comment that permanent BTM is usually not pointed to as proxy for quality of accounting information, because it is not related to the recognition of accruals, which is an aspect inherent in the accounting process. However, there are indications that high permanent BTM values relate to decreased persistence in the results, which points to deterioration in the quality of earnings (Marques, Costa, & Silva, 2016). In addition, well-developed strategies to minimize tax burden may involve provisions of income tax, one of the sources of permanent BTM, and result in diversion of financial resources coming from the practice of tax evasion (Desai & Dharmapala, 2006). Thus, to determine how much permanent BTM is affecting the quality of information, the auditor should incur greater effort and take more risks, which can result in a positive association with the required fees.

Temporary BTM originates from transactions that are recognized in both systems, but which differ as to measurement period, and it may occur "when certain operations are recognized in the accounting, but have no effect in terms of tax, or vice versa" (Costa & Lopes, 2015). Thus, it has timely character, because it has as characteristic its reversion at a given moment (Hanlon *et al.*, 2012). Compared with permanent BTM, the temporary portion of the difference between BI and TI is less associated with the uncertainties of the market participants, but still represents some degree of risk from the perspective of the companies' future results (Comprix *et al.*, 2011). However, similarly to permanent BTM, the temporary portion is related to lower persistence of the results, characteristic which indicates lower quality of earnings. Due to these reasons, it can be considered that temporary BTM increases the risk for the auditor and affects audit fees (Hanlon *et al.*, 2012).

Positive BTM occurs when BI is higher than TI, and may involve both accounting choices and earnings management, with the objective of maximizing BI and/or reducing tax burden (Tang, 2005a, 2006). Due to the need for greater efforts and to the complexity involved in determining if the BTM results from accounting choices inherent in the adoption of the IFRS or from the manager's discretionary manipulation, auditors raise fees in light of positive BTM (Hanlon *et al.*, 2012). Heltzer (2009) found that, in the years in which the companies showed positive variations in the BTM, they presented increase in the timely recognition of gains, that is, reduction in conditional conservatism, which may be a sign of earnings management (Hanlon, 2005). Thus, reduced conservatism in light of positive BTM may represent a "red flag" for the auditor, raising the remuneration required by him/her.

The fact that TI is higher than BI in negative BTM may not increase audit risks, as it reduces the chance of litigation with the country's tax authority, since higher TI results in higher tax burden, and is not able to capture the overestimation of the revenues registered for accounting purposes in relation to tax revenues (Hanlon *et al.*, 2012).

On the other hand, Heltzer (2009) found that, in years in which the companies showed negative BTM, these companies showed higher unconditional conservatism in BI and lower conditional and unconditional conservatism in TI. This fact indicates degradation in the quality of the results, since unconditional conservatism is related to practices of earnings management (Qiang, 2007). Therefore, as in the case of the other types of BTM, negative BTM can relate positively with audit fees due to increasing the risk of the auditor.

In summary, Hanlon *et al.* (2012) found positive relation between fees and total, permanent, and temporary BTD for U.S. companies. For the Brazilian context, Martinez & Lessa (2014) tested and found the list of fees only with the total BTD. Thus, the present research advances the discussion by analyzing the types of BTD analyzed by the cited authors, and adds the analysis of normal, abnormal, positive, and negative BTD, for the Brazilian context, as a case of a civil law country. Therefore, the following research hypothesis is propounded: The types of BTD are positively related with audit fees.

It is expected that the effect of the BTD on audit fees is different depending on whether this BTD is positive or negative. The literature points out that the fact a company presents higher BI than TI (positive BTD) can be an indication of earnings management (Hanlon *et al.*, 2012). Thus, it is expected that positive BTD has stronger relation with audit fees than negative BTD.

2.2 Other audit fees determinants

Company size can be an interference factor in fees pricing, since large companies have more complex operations which require greater effort and more hours from the audit professional (Simunic, 1980; Francis, 1984; Hallak & Silva, 2012; Castro, Peleias & Silva, 2015; Borges, Nardi & Silva, 2017).

The number of operating segments is pointed to as an element that substantially increases the complexity of the companies' operations and impact positively on audit fees determination, as it increases the diversification of the entity's financial reports and the number of centers of decision to be monitored (Simunic, 1980).

In this line of thought, negotiations in the foreign market, such as the issuance of ADRs, for example, present greater complexity in the audit work, due to the criteria that must be met in accordance with international stock exchanges (Hanlon *et al.*, 2012), which may raise audit fees.

Audit fees may also be influenced by the representativeness of the investments in stocks (Simunic, 1980, Borges *et al.*, 2017) and by significant amounts of receivables (Wu, 2012). Auditing these assets requires effort and entails risks for the auditor, who must validate the measurement methods and the criteria to be applied by means of specific audit procedures that are recommended for these accounts (Simunic, 1980; Wu, 2012).

Discretionary accruals increase the risk of litigation for auditors and increase the need for their effort (Hanlon *et al.*, 2012). Although the nature of accruals is related to the temporality of the recognition of values in the result, managers can act in a discretionary manner to increase them or reduce them in order to manage the result of the entity, which may evidence the association between the auditor's effort and risk, raising the fees to be charged (Martinez, 2008).

The 'Big 4' status of the audit firm can also influence the amount of these required fees. These companies have more resources for the development of audit work, higher level of specialization, higher competence, and better reputation in audit work; therefore, they charge higher fees for this differentiation in the provision of service (Francis, 1984; Yatim, Kent & Clarkson, 2006; Hallak & Silva, 2012; Castro *et al.*, 2015; Borges *et al.*, 2017).

When audit work may pose risk and financial and moral losses, audit fees reflect the differences between the levels of responsibility of the auditor (Seetharaman, Gul & Lynn, 2002). According to these authors, audit fees are higher when the independent auditing firm is likely to issue an opinion with caveats.

Companies that have higher financial leverage, higher degree of indebtedness, or present losses have higher chances of insolvency, so they increase the risks for audit professionals, which consequently raises the fees (Arruñada, 1997, Castro *et al.*, 2015).

Finally, more profitable companies offer lower risk for auditors, because the possibility that they present financial difficulties is significantly lower compared with those that are not profitable, thus reducing audit risks and audit fees (Hanlon *et al.*, 2012; Borges *et al.*, 2017).

3 METHODOLOGICAL PROCEDURES

The sample of this research consists of non-financial Brazilian listed companies that traded shares in BM&FBovespa from 2010 to 2014. We excluded companies belonging to sectors of "Funds," "Insurance," and "Finance," since these have peculiarities that are not applicable to the other sectors. We also excluded 101 companies that did not disclose the audit fees during the period of study, resulting in a final sample organized in a balanced panel with 246 companies.

Details of the sample are presented in the Supplementary Material appended to this research. The 2010–2014 period is after the IFRS were adopted in Brazil and coincides with the issue of Normative Instruction nº 480/2009 of CVM, which made mandatory the disclosure of auditor's remuneration during the year.

To test the relationship between audit fees (AUDITFEE) and BTD we used the model of Hanlon *et al.* (2012), specified in Equation 1. The control variables used are: the accruals (ACC), if the audit firm is a Big4; the company's total assets (ASSET); the number of segments in which the company operates (SEG); the complexity of the operations for issuing ADR; the stocks (INV); the receivables (REC), the indebtedness (DEBT), the profitability by the EBIT (INCOME); if negative result was observed in the period (LOSS); and, finally, the opinion of the audit (AUDOPIN). For additional information about the description and the calculation of the variables used in Equations 1 to 7, we suggested consulting the aforementioned Supplementary Material.

$$AUDITFEE_{it} = \alpha_i + \beta_1 Total\ BT D_{it} + \beta_2 ACCR_{it} + \beta_3 BIG4_{it} + \beta_4 ASSET_{it} + \beta_5 BUSSEG_{it} + \beta_6 ADR_{it} + \beta_7 INV_{it} + \beta_8 REC_{it} + \beta_9 DEBT_{it} + \beta_{10} INCOME_{it} + \beta_{11} LOSS_{it} + \beta_{12} AUDIOPIN_{it} + \varepsilon_{it} \quad (1)$$

The model specified in Equation 1 was tested for each type of BT D separately: total, permanent, temporary, positive, negative, normal, and abnormal.

Total BT D is the total difference between BI and TI (Equation 2). In this study, the BI used is Earnings Before Taxes (EBT), since this is the company's final corporate income before taxes. TI is not widely evidenced by Brazilian companies in the explanatory notes, so this variable is estimated by extrapolation of Current Tax Expenses (CTE) minus Deferred Tax Expenses (DTE), divided by the maximum rate of Income Tax (A).

$$Total\ BT D_{it} = \text{Log} \left(| EBT_{it} - \left(\frac{(CTE_{it} - DTE_{it})}{A_{it}} \right) | \right) \quad (2)$$

To estimate permanent BT D and temporary BT D, we used Equations 3 and 4, respectively:

$$Permanent\ BT D_{it} = \text{Log} \left(\left| \frac{(Total\ BT D_{it} - DTE_{it})}{A_{it}} \right| \right) \quad (3)$$

$$Temporary\ BT D_{it} = \text{Log} | CTE | \quad (4)$$

Positive BT D and negative BT D were calculated respectively according to Equations 5 and 6:

$$Positive\ BT D_{it} = \text{Log} (| EBT - TI_{it} |), \text{ se } EBT_{it} > TI_{it} \quad (5)$$

$$Negative\ BT D_{it} = \text{Log} (| EBT_{it} - TI_{it} |), \text{ se } EBT_{it} < TI_{it} \quad (6)$$

To estimate normal and abnormal portions of total BT D, we used Equation 7, which was adapted from the model of Tang (2006) and Martinez and Passamani (2014):

$$Total\ BT D_{it} = \alpha_i + \beta_1 INV_{it} + \beta_2 \Delta REV_{it} + \beta_3 NOL_{it} + \beta_4 DTE_{it} + \beta_5 TA_DIFF_{it} + \beta_6 \Delta STO_{it} + \varepsilon_{it} \quad (7)$$

Abnormal BT D was obtained by estimating the residues (ε_{it}) of Equation 7 and normal BT D was calculated by subtracting abnormal BT D from total BT D.

4 RESULTS AND DISCUSSIONS

4.1 Descriptive analysis

The value of the audit fees is equivalent to approximately R\$ 169,000 (5.227 - value in Table 1 in logarithmic order). It was observed that 25% of the companies pay annual fees of R\$ 53,000 (4.724) and more than 50% pays the audit over R\$ 230,000.

Table 1. Descriptive statistics

Variable	n	Mean	Standard deviation	Minimum	25%	Median	75%	Maximum
Audit fees	1230	5.227	0.732	3.466	4.724	5.362	5.708	7.002
Total BTD	1132	4.854	1.247	1.869	4.211	5.096	5.771	7.000
Temporary BTD	846	4.030	0.888	1.602	3.476	4.107	4.605	5.977
Permanent BTD	1132	4.896	1.247	1.869	4.260	5.167	5.803	7.015
Normal BTD	826	5.186	0.789	3.222	4.533	5.237	5.773	6.968
Abnormal BTD	826	0.000	0.335	-2.106	-0.099	0.031	0.150	1.083
Positive BTD	805	5.201	1.021	1.869	4.660	5.369	5.916	7.000
Negative BTD	327	4.000	1.341	1.869	2.674	4.228	5.031	6.928
Accruals	1222	4.518	1.320	0.091	3.957	4.765	5.400	6.873
Assets	1227	5.843	1.415	1.000	5.375	6.176	6.704	8.332
Business Segments	1230	0.108	0.213	0.000	0.000	0.000	0.000	0.778
Inventory	1218	0.080	0.108	0.000	0.000	0.012	0.137	0.446
Receivables	1218	0.162	0.179	0.000	0.033	0.111	0.220	0.887
Indebtedness	1222	0.279	0.258	0.000	0.049	0.261	0.428	1.405
Profitability	1222	-0.256	1.823	-15.200	-0.008	0.054	0.116	0.470

Source: Prepared by the authors.

It is noted that, with the exception of abnormal BTD, for all types of BTD, the mean surpassed 4.00 (Table 1). These results differ from that presented by Hanlon *et al.* (2012), who found values close to 2.00. These findings suggest that the BTDs of Brazilian listed companies are higher compared with those of U.S. companies, corroborating André, Broye, Pong, and Schatt (2011), who pointed out the trend of BTD being higher in countries of civil law origin. For the control variables, the means were similar to those found by Hanlon *et al.* (2012), except for the accruals that presented inconsistency with the international result (4.518 against 2.634).

It is observed that the audit fees showed positive and significant association with all control variables (Table 2). However, for profitability, the signal differed from that expected, suggesting that the higher the company's profitability, the higher the audit fee.

Table 2. Matrix of correlation between the model variables and the types of BTD

	<i>Audit Fees</i>	<i>Total BTD</i>	<i>Tempor. BTD</i>	<i>Perman. BTD</i>	<i>Abnormal BTD</i>	<i>Normal BTD</i>	<i>Positive</i>	<i>BTD negativa</i>
Audit Fees	1.000	0.581**	0.220**	0.595**	-0.0292	0.352**	0.435**	0.690**
Accruals	0.563**	0.839**	0.582**	0.847**	0.159**	0.681**	0.754**	0.904**
Assets	0.614**	0.876**	0.713**	0.882**	0.102**	0.857**	0.860**	0.875**
Business Segments	0.147**	0.242**	0.142**	0.241**	0.0188	0.183**	0.191**	0.332**
Inventorys	0.155**	0.109**	-0.170**	0.099**	-0.035	-0.160**	-0.039	0.259**
Receivables	0.114**	0.142**	-0.096**	0.145**	-0.009	-0.115**	-0.004	0.184**
Indebtedness	0.256**	0.322**	0.127**	0.328**	0.034	0.079**	0.232**	0.434**
Profitability	0.286**	0.370**	-0.031	0.376**	0.043	0.200**	0.361**	0.406**

Source: Prepared by the authors.

Note: ** denotes statistical significance at 5%.

The correlation coefficient value of 0.581, found for total BTM, in Table 4, is consistent with that found by Hanlon *et al.* (2012) of 0.528 for U.S. companies. Thus, although the correlation coefficient does not allow to determine causation in this relation, it can be said that the behavior of the BTM assists in understanding the behavior of audit fees and vice versa. The other types of BTM, except for abnormal BTM, are positively related with fees, which suggests that companies that present higher BTM represent greater risk and complexity, which can raise audit fees.

4.2 Multivariate Analysis

Table 3 presents the results of the tests of Equation 1 for all types of BTM, with the equations for temporary BTM and positive BTM estimated by random effects and the equations for the other types of BTM estimated by fixed effects, according to results of the tests Chow, Breusch and Pagan and Hausman.

Positive BTM is related with audit fees (Table 3). Specifically, for each 1% increase in positive BTM, there is 8.8% increase in fees (coefficient β_1). Higher BI than TI can represent greater risk of loss and greater effort of auditors, which raises the remuneration of these professionals. The fact that positive BTM can include both earnings management and tax evasion practices can justify the relation between this variable and audit fees (Hanlon *et al.*, 2012).

Another possible explanation is the fact that positive BTM is related negatively with conditional conservatism (Heltzer, 2009). This suggests that companies that present positive BTM recognize the gains more timely, which can be a sign of earnings management. It is inferred that auditors feels exposed to greater risks with reduction in conditional conservatism, raising their fees.

The other types of BTM showed no relation with audit fees (Table 3). These results differ from those found by Hanlon *et al.* (2012) and Martinez & Lessa (2014). A possible justification for this result may be the civil law origin of Brazil, and the way tax adjustments are carried out on BI. The volume of adjustments may discourage auditors from further analyzing the BTM, leading them to interpret that these types of BTM do not increase audit risk, therefore they are not reflected in the required fees. While in relation to the study of Martinez & Lessa (2014), a possible explanation for the difference in results can be the sample period (2009 to 2011) and the stage of partial adoption of the IFRS. The learning curve in adoption of IFRS (Costa & Lopes, 2015) can justify this distinction in results.

The audit firm's status has influence on fees. This result corroborates those of Simunic (1980), Francis (1984), Yatim *et al.* (2006), and Martinez & Lessa (2014), who suggested that there is increase in these fees due to the high reputation and competence of the Big4.

Table 3. Impacts of the types of BTD on Audit Fees (Equation 1)

Variables		<i>Total BTD</i>	<i>Permanent BTD</i>	<i>Abnormal BTD</i>	<i>Normal BTD</i>	<i>Negative BTD</i>	<i>Temporary BTD</i>	<i>Positive BTD</i>
BTD ¹	β_1	0.012	0.044	-0.018	0.833	-0.038	-0.002	0.088
	Stat.	0.420	1.180	-0.570	1.840	-0.670	-0.080	2.160**
Accruals	β_2	-0.026	-0.031	-0.018	-0.020	0.025	-0.018	-0.043
	Stat.	-1.250	-1.450	-0.780	-0.880	0.750	-0.720	-1.560
BIG4	β_3	0.155	0.152	0.146	0.141	0.171	0.170	0.233
	Stat.	3.770***	3.680***	3.220***	2.910***	1.920*	4.210***	4.780***
Assets	β_4	0.004	-0.003	0.197	0.198	0.002	0.264	0.235
	Stat.	0.090	-0.070	1.650	1.620	0.050	4.030***	3.720***
Business Segments	β_5	-0.068	-0.067	-0.042	-0.033	0.161	-0.056	-0.112
	Stat.	-0.680	-0.670	-0.370	-0.300	1.180	-0.530	-0.990
Complexity of the operations	β_6	0.060	0.063	0.076	0.068	0.089	0.035	-0.050
	Stat.	0.810	0.840	0.770	0.700	0.690	0.390	-0.580
Inventory	β_7	-0.135	-0.118	-0.130	-0.095	-0.426	0.518	0.580
	Stat.	-0.240	-0.210	-0.230	-0.170	-0.630	1.490	1.950*
Receivables	β_8	-0.569	-0.574	-0.731	-0.790	-0.246	-0.278	-0.222
	Stat.	-3.040***	-3.060***	-2.650***	-2.730***	-1.870*	-1.290	-1.240
Indebtedness	β_9	0.030	0.027	0.022	0.108	0.078	-0.091	0.066
	Stat.	0.420	0.380	0.210	0.920	1.510	-0.800	0.510
Profitability	β_{10}	0.017	0.018	0.050	0.120	0.021	0.019	-0.030
	Stat.	1.610	1.720*	0.410	0.880	1.800*	0.130	-0.140
Negative Result	β_{11}	0.055	0.054	0.043	0.120	0.086	0.041	-0.007
	Stat.	1.610	1.610	1.040	0.880	3.130***	0.900	-0.100
Opinion of the audit	β_{12}	-0.025	-0.021	-0.001	0.011	0.003	-0.054	0.038
	Stat.	-0.440	-0.370	-0.020	0.140	0.060	-0.690	0.330
Cons	α	5.269	5.174	4.276	-0.071	4.892	3.750	3.453
	Stat.	22.000***	21.740***	5.830***	-0.030	20.290***	9.690***	13.220***
R-sq: within		0.029	0.031	0.029	0.038	0.107		
Prob.> F		0.000	0.000	0.003	0.001	0.000		
R-sq: overall							0.098	0.242
Prob.> chi2							0,000	0,000

Source: Prepared by the authors.

Note: ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

1 – represents the types of BTD; Equation 1 was tested seven times, once for each type of BTD.

The negative sign of the Receivables is contrary to that pointed to by Simunic (1980) and Hanlon *et al.* (2012). For all models, the VIF statistics for Receivables was analyzed, remaining below 2.0. Thus, the hypothesis that multicollinearity could have influenced the reversal of sign was ruled out in all cases.

Sensitivity tests were performed, replacing the formula for calculating BTD specified in Equation 2 with those used by Costa and Lopes (2015) for the Brazilian context, and the results were similar to those shown in Table 3. Another test performed was the application of Equation 1 by sector of activity. In this context, temporary BTD presented relation with audit fees for the sectors of Foods and Beverages, Industrial Machinery, Chemistry, Software and Data, and Vehicles and Parts; while permanent BTD for the sector of Foods and Beverages. Negative BTD was significant for the sectors of Steel and Metallurgy, Telecommunications, and Textiles, while abnormal BTD for the sector of Vehicles and Parts. These results suggest that analyzing the BTD by sector is relevant to assess the impact of this variable on audit fees.

5 FINAL CONSIDERATIONS

Audit fees are associated only with positive BTD. This type of BTD can result from operations of merger, demerger and incorporation, tax planning, utilization of benefits and tax losses, conditional conservatism, and discretionary manipulations. It is inferred that the examination of the causes for the emergence of positive BTD makes managers' risk assessment more thorough, and represents a "red flag" for the possibility of litigation by the tax authority due to tax evasion, of financial losses, and of loss of reputation of the audit firm. These risks, in addition to the effort required from the auditor in order to determine the origin of positive BTD, lead to raise in audit fees.

Differently from Hanlon *et al.* (2012), for a civil law country that which most affected audit fees was positive difference between book income and taxable income, which is probably due to the higher level of earnings management and tax evasion in this type of country, even boosted after adoption of IFRS (see Jeanjean & Stolowy, 2008).

Reduction of conditional conservatism in the presence of greater volume of positive BTD (Heltzer, 2009) may, also, be an explanation for the raise of audit fees. Auditors can expect greater exposure to risk in case of a more timely recognition of gains, requiring higher fees for additional and more robust testing. This possible discomfort of auditors in light of positive BTD, derived from reduction in conditional conservatism, can still be a holdover of the conservative culture of accountants in recording gains and losses.

The results of this research contribute to the literature by demonstrating the relevance of researching the relation of audit fees with BTDs classified according to type, sector, and to civil and common law origin.

Finally, the results may lead auditors, investors, analysts, regulators, and managers to consider the role of positive BTD as "red flag" for earnings management and tax evasion.

REFERENCES

- André, P., Broye, G., Pong, C. K. M., & Schatt, A. (2011). Audit fees, big four premium and institutional settings: the devil is in the details! *SSRN Working Paper*.
- Arruñada, B. (1997). *La calidad de la auditoria: incentivos privados y regulacion*. Madrid: Marcial Pons.
- Barth, M. E., Landsman, W. R. & Lang, M. H. (2008). International accounting standards and accounting quality. *Journal of Accounting Research*, 46(3), 467–498.
- Bedard, J., & Johnstone, K. (2004). Earnings manipulation risk, corporate governance risk, and auditor is planning and pricing decisions. *The Accounting Review*, 79, 277-304.
- Borges, V., Nardi, P., & Silva, R. (2017). Determinantes dos Honorários de Auditoria das Empresas Brasileiras de Capital Aberto. *Contabilidade, Gestão e Governança*, 20(2), 216-230.

- Castro, W., Peleias, I., & Silva, G. (2015). Determinantes dos Honorários de Auditoria: um Estudo nas Empresas Listadas na BM&FBOVESPA, Brasil. *Revista Contabilidade & Finanças*, 26(69), 261-273.
- Comprix, J., Graham Jr. R. C., & Moore, J. A. (2011). Empirical evidence on the impact of book-tax differences on divergence of opinion among investors. *Journal of the American Taxation Association*, 33(1), 57-78.
- Costa, P. S., & Lopes, A. B. (2015). *Implicações da adoção das IFRS sobre as book-tax differences: o caso do Brasil*. Alemanha: NEA.
- Desai, M. A., & Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics*, 79(1), 145-179.
- Formigoni, H., Antunes, M. T. P., & Paulo, E. (2009). Diferença entre o Lucro Contábil e Lucro Tributável: uma análise sobre o gerenciamento de resultados contábeis e gerenciamento tributário nas companhias abertas brasileiras. *Brazilian Business Review*, 6, 44-61.
- Francis, J. R. (1984). The effect of audit firm size on audit prices. *Journal of Accounting and Economics*, 6, 133-151.
- Gul, A., Chen, C. J. P., & Tsui, J. S.L. (2003). Discretionary Accounting Accruals, Managers' Incentives, and Audit Fees. *Contemporary Accounting Research*, 20(3), 441-464.
- Hallak, R. T. P., & Silva, A. L. C. (2012). Determinantes das despesas com serviços de auditoria e consultoria prestados pelo auditor independente no Brasil. *Revista Contabilidade & Finanças*, 23(60), 223-231.
- Hanlon, M. (2005). The persistence and pricing of earnings, accruals, and cash flows when firms have large book-tax differences. *The accounting review*, 80(1), 137-166.
- Hanlon, M., Krishnan, G. V., & Mills, L. F. (2012). Audit Fees and Book-Tax Differences. *The Accounting Review*, 34(1), 55-86.
- Heltzer, W., & Shelton, S. W (2011). *Book-tax differences and audit risk: evidence from the United States*. Working paper, DePaul University.
- Heltzer, W. (2009). Conservatism and book-tax differences. *Journal of Accounting, Auditing and Finance*, 24(3), 469-504.
- Hribar, P., Kravet, T., & Wilson, R. (2014). A new measure of accounting quality. *Review of Accounting Studies*, 19(1), 506-538.
- Iudícibus, S., Martins, E., & Carvalho, L. N. (2005). Contabilidade: aspectos relevantes da epopeia de sua evolução. *Revista Contabilidade & Finanças*, 16(38), 7-19.
- Jeanjean, T., & Stolowy, H. (2008). Do accounting standards matter? An exploratory analysis of earnings management before and after IFRS adoption. *Journal of Accounting Public Policy*, 27, 480-494.
- Klann, R. C., & Beuren, I. M. (2011). *Efeitos da convergência contábil às IFRS no gerenciamento de resultados de empresas europeias*. Anais do Congresso ANPCONT, Vitória, ES, Brasil, 5.
- Marques, A. V. C., Costa, P. S., & Silva, P. R. (2016). Relevância do Conteúdo Informacional das Book-Tax Differences para Previsão de Resultados Futuros: Evidências de Países-Membros da América Latina. *Revista Contabilidade & Finanças*, 27(70), 29-42.
- Martinez A. L. (2008). Detectando Earnings Management no Brasil: Estimando os Accruals discricionários. *Revista de Contabilidade & Finanças*, 19, 7-17.
- Martinez, A. L., & Passamani, R. R. (2014). Book-Tax Differences e sua Relevância Informacional No Mercado de Capitais No Brasil. *Revista de Gestão, Finanças e Contabilidade*, 4(2), 20-37.

- Martinez, A.L., & Lessa, R. C. (2014). The Effect of Tax Aggressiveness and Corporate Governance on Audit Fees: Evidences from Brazil. *Journal of Management Research*, 6(1), 95–108.
- Mills, L. F., Newberry, K., & Trautman, W.B. (2002). Trends in book-tax income and balance sheet differences. SSRN. Recuperado de http://papers.ssrn.com/sol3/papers.cfm?abstract_id=313040.
- Qiang, X. (2007). The effects of contracting, litigation, regulation, and tax costs on conditional and unconditional conservatism: Cross-sectional evidence at the firm level. *The Accounting Review*, 82(3), 759-796.
- Oliveira, J. L. R., Souza, A. A., & Vieira, C. M. (2004). Análise dos fatores envolvidos na estimação de custos e formação de preço das empresas de auditoria. *Contabilidade Vista & Revista*, 15(2), 107-125.
- Seetharaman, A., Gul, F. A., & Lynn, S. G. (2002). Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets. *Journal of Accounting and Economics*, 33(1), 91-115.
- Simunic, D. (1980). The pricing of audit services: theory and evidence. *Journal of Accounting Research*, 18, 161-190.
- Tang, T. Y. H. (2005a). Book-Tax Differences, a Proxy for Earnings Management and Tax Management – Empirical Evidence from China. *SSRN Electronic Journal*, 1-36.
- Tang, T. Y. H. (2005b). The Market Perception of *BTD*: an empirical study in China's capital markets. *The Accounting Review*.
- Tang, T. Y. H. (2006). The Value Relevance of Book-Tax Differences - An Empirical Study in China's Capital Market. *SSRN Eletronic Journal*.
- Wu, X. (2012). Corporate governance and audit fees: Evidence from companies listed on the Shanghai Stock Exchange. *China Journal of Accounting Research*, 5(4), 321-342.
- Yatim, P., Kent, P., & Clarkson, P. (2006). Governance structures, ethnicity, and audit fees of Malaysian listed firms. *Managerial Auditing Journal*, 21(7), 757-782.

SUPPLEMENTARY MATERIAL

The sample of this research consisted of Brazilian listed companies that traded shares in BM&FBovespa from 2010 to 2014. This period was chosen due to including the adoption of IFRS in Brazil, based on the perspective that the principle-based approach could encourage managers to make more accounting choices (Agoglia, Doupnik & Tsakumi, 2011), increasing the BTM. Moreover, it coincides with the issuance of CVM Normative Instruction No. 480, of December 7, 2009, which established as mandatory the disclosure of information relating to independent auditors, such as description of contracted services and total amount of remuneration in the last fiscal year.

The data for the research were collected from the Economática™ base, and later cross-checked with the financial statements disclosed by the companies in the Brazilian Securities and Exchange Commission (CVM), considering a random sampling criterion. They were cross-checked in order to determine inconsistencies in information such as incorrect data, sign reversions, among other investments. The Opinion of the Audit was obtained on the CVM website, as well as information about Segments (Explanatory Notes) and audit fees (Reference Form).

We considered the companies belonging to the 20 basic sectors of Economática™, with the exception of those belonging to "Funds," "Insurances," and "Finances," since these sectors have peculiarities that are not applicable to the other sectors. We eliminated the observations that did not contain information disclosed in relation to the dependent variable. The criterion led to complete exclusion (of all periods) of companies that omitted the audit fees in one or more periods. Table 1 summarizes the treatment of the sample.

Table 1. Treatment of the data

	Companies (per year)	Observations (total sample)
Initial remarks	347	1,735
(-) Companies that did not disclose the audit fees	(101)	(505)
(=) Final sample	246	1,230

Source: Prepared by the authors.

There were two distinct ways of mitigating the influence of outliers in the sample, the first being the winsorization process, "which eliminates, in an orderly fashion, an equal number of observations of each side of the distribution," and the second by full exclusion of the observation, resulting in undesired reduction of the sample, statistically (Fávero, Belfiore, Silva, & Chan, 2009, p.56). Considering that the sample had already been reduced by the exclusion of the observations with missing data of the dependent variable, we opted for the winsorization at 1%.

The types of BTM for the three specifications of panel data – pooled, fixed effects, and random effects – were tested in software Stata 12®. For definition of the most appropriate model for the data, we used the tests Chow, Breusch and Pagan and Hausman.

Similarly to the study of Hanlon *et al.* (2012), the main independent variable of this research is the BTM. For its estimation, the authors considered the logarithm of the absolute value of the difference between Earnings Before Taxes, Taxable Income, and Tax Loss unused in the period.

Taxable Income is not widely evidenced by companies that trade stocks in the United States, so Hanlon *et al.* (2012) used extrapolation to calculate this income. The extrapolation was carried out through the difference between Income Tax Expense and Deferred Income Tax Expense, scaled by the maximum rate of 35% in the United States.

In the present research, the extrapolation used was based on the maximum tax rate of 34%, which can be paid in the Brazilian context. In addition, as it is not mandatory to disclosure tax loss in explanatory notes, we opted for eliminating this variable from the calculation as already developed in other previous studies such as Costa and Lopes (2015) and Marques *et al.* (2016).

In the original model, Hanlon *et al.* (2012) use the participation of companies audited in foreign markets based on income before foreign taxes (FGN in the text of the authors). Disclosure of this information in financial statements is not mandated by CVM.

However, it was conjectured that it could be available in complementary material of published financial statements. For the purpose of verification by sampling for validation, some companies were analyzed by random sampling criteria. It was observed that income before foreign taxes was not disclosed in any of the cases analyzed. Thus, replacing the variable 'FGN' in Hanlon *et al.* (2012), we used as proxy whether Brazilian companies issue securities receipts in depository banks abroad (ADR). This variable is considered a proxy for complexity of operations and assumes value 1 in years of ADR issuance and subsequent years and 0 for companies that did not issue ADR. This classification is based on the assumption that ADR issuance increases the complexity of operations of audited companies. Thus, it is expected that audit fees are higher not only in year of ADR issuance, but that they are higher for companies that, at some point, were issuers of these receipts compared with those that were not.

We also highlight that Hanlon *et al.* (2012) used the logarithm of the number of operating segments, since this is the information available on Compustat. In this research, the information per segment were collected directly in the explanatory notes of financial statements of Brazilian listed companies. Differently from the United States, where only operating segments are disclosed in a segregated manner, in Brazil some companies disclose only what they call segments by geographic region. In most cases, it was observed that there is no information that can elucidate whether the segments by geographic region are operationally and conceptually similar to those business segments mentioned in the IFRS. Therefore, we collected the number of segments by geographic region and by business segments, and used the logarithm of the number of segments by geographic region for those companies that did not disclose the number of operating segments.

For estimation of the main model, we used Equation 1:

$$AUDITFEE_{it} = \alpha_i + \beta_1 Total\ BT D_{it} + \beta_2 ACCR_{it} + \beta_3 BIG4_{it} + \beta_4 ASSET_{it} + \beta_5 BUSSEG_{it} + \beta_6 ADR_{it} + \beta_7 INV_{it} + \beta_8 REC_{it} + \beta_9 DEBT_{it} + \beta_{10} INCOME_{it} + \beta_{11} LOSS_{it} + \beta_{12} AUDIOPIN_{it} + \varepsilon_{it} \quad (1)$$

In which:

AUDITFEE = Audit Fees, calculated through the audit fees logarithm shown in the CVM Reference Form.

Total BT D = Total difference between Book Income (BI) and Taxable Income (TI), calculated according to Equation 2. Alternatively, it was replaced with permanent BT D, temporary BT D, positive BT D, negative BT D, abnormal BT D, and normal BT D, according to the respective Equations presented below.

ACCR = Accruals, calculated by the logarithm of the absolute value of the difference between the EBT and the net cash flow of the operations.

Big4 = Audit firm Status, in which the dummy is equal to 1 for companies audited by a Big4, and 0 otherwise.

ASSET = Assets, estimated logarithm of total assets.

BUSSEG = Business segments, estimated by the logarithm of the number of operating segments. In the case of companies that consider only the geographical regions as reportable segments, we considered the logarithm of the number of regions.

ADR = Complexity of Operations, in which dummy assumes value 1 when companies have issued ADRs in year *t* or in previous periods, and 0 otherwise.

INV = Stocks, values of short-term and long-term stocks, scaled by the mean of the Assets.

REC = Receivables, values of short-term and long-term accounts receivable scaled by the mean of the total assets.

DEBT = Indebtedness, values of the onerous liability of short and long term scaled by the mean of the total assets.

INCOME = Profitability, estimated by the Earning Before Interest and Taxes (EBIT) scaled by the mean of total assets.

LOSS = Negative Result, in which the dummy assumes value 1 if the result of company *i* is negative in period *t* or in the last two periods, and 0 otherwise.

AUDOPIN = Opinion of the Audit, in which the dummy assumes value 1 if company *i* received modified audit opinion in year *t*, and 0 otherwise.

Total BTĐ was estimated as specified in Equation 2.

$$\text{Total BTĐ}_{it} = \text{Log} \left(\left| \text{EBT}_{it} - \left(\frac{(\text{CTE}_{it} - \text{DTE}_{it})}{A_{it}} \right) \right| \right) \quad (2)$$

In which:

EBT = Earnings Before Taxes of company *i* in year *t*.

CTE = Current Tax Expenses of company *i* in year *t*.

DTE = Deferred Tax Expenses of company *i* in year *t*.

A = Maximum rate of income tax of company *i* in year *t*.

Permanent BTĐ and temporary BTĐ were estimated as in Hanlon *et al.* (2012), shown in Equations 3 and 4:

$$\text{Permanent BTĐ}_{it} = \text{Log} \left(\left| \frac{(\text{Total BTĐ}_{it} - \text{DTE}_{it})}{A_{it}} \right| \right) \quad (3)$$

$$\text{Temporary BTĐ}_{it} = \text{Log} | \text{CTE} | \quad (4)$$

In which:

Total BTĐ = Value estimated by applying Equation 2 of company *i* in year *t*.

DTE = Deferred Tax Expenses of company *i* in year *t*.

A = Maximum rate of income tax of company *i* in year *t*.

CTE = Current Tax Expenses of company *i* in year *t*.

Positive BTĐ and negative BTĐ were determined through the year-to-year difference and for each company, between EBT and TI, as demonstrated in Equations 5 and 6:

$$\text{Positive BTĐ}_{it} = \text{Log} (| \text{EBT} - \text{TI}_{it} |), \text{ se } \text{EBT}_{it} > \text{TI}_{it} \quad (5)$$

$$\text{Negative BTĐ}_{it} = \text{Log} (| \text{EBT}_{it} - \text{TI}_{it} |), \text{ se } \text{EBT}_{it} < \text{TI}_{it} \quad (6)$$

When EBT was higher than the extrapolation of TI, the difference was named positive BTĐ. On the other hand, when EBT was lower than the extrapolation of TI, this difference was named negative BTĐ.

Through application of the econometric model used by Tang (2006) and Martinez and Passamani (2014) in previous studies (Equation 7), we estimated the normal and abnormal portions of the BTĐ.

$$\text{Total BTĐ}_{it} = \alpha_i + \beta_1 \text{INV}_{it} + \beta_2 \text{AREV}_{it} + \beta_3 \text{NOL}_{it} + \beta_4 \text{DTE}_{it} + \beta_5 \text{TA_DIFF}_{it} + \beta_6 \Delta \text{STO}_{it} + \varepsilon_{it} \quad (7)$$

In which:

Total BTĐ = Total difference between EBT and TI of company *i* in year *t*, obtained by Equation 2.

INV = Sum of investment accounts, fixed assets, intangible assets, and deferred assets (remaining balance of the account, if any) of company *i* in year *t*, weighted by the delayed Assets.

AREV = Variation in the revenue of company *i* from year *t*-1 to year *t*, weighted by delayed Assets.

NOL = Current Tax Expense when positive of company i in year t , divided by 0.34. If IT/current CSLL [Social Contribution on Net Profits] is not positive, value 0 is assumed.

DTE = Deferred Tax Expenses of company i in year t , weighted by delayed Assets.

TAX_DIFF = Equity subtracted from Net Profits of company i in year t , weighted by delayed Assets.

ΔSTO = Variation in the stocks of company i from year $t-1$ to year t , weighted by delayed Assets.

The variables INV and ΔREV are considered proxies for changes in the economy. Thus, the higher the value for these variables, the higher the probability of existing non-deductible expenses, which will culminate in the expectation of negative sign for the coefficient of both (Martinez & Passamani, 2014).

The variable NOL is a proxy for tax loss, since compensated tax loss is usually not evidenced in financial statements. Martinez and Passamani (2014) comment that this absence can be explained by the determination established in art. 510 of the Income Tax Regulations (RIR/1999), which establishes the maximum of 30% of the net income adjusted by the additions and exclusions provided for in the respective rules, as limit for compensation. As for the sign, it is expected that the coefficient is positive, because as the tax losses are compensated there will be a positive variation in BTD (Martinez & Passamani, 2014).

The variable DTE is a proxy to control the effects of tax losses due to this variable being constituted of temporary difference between the tax and corporate norms. Thus, if this variable is positive, it can be said that the constitution of temporary difference was greater than the compensation of past temporary differences. As for the coefficient, it is expected that it is negative, which would impact positively on BTD .

The variable TAX_DIFF is considered by the fact that, in Brazil, interest on equity may be deductible from the base for calculation of income taxes, which impacts significantly on BTD (Martinez & Passamani, 2014). Due to this variable being base of calculation for distribution of interest on equity, which is deductible for tax purposes, it is estimated that its coefficient is positive.

The variable ΔSTO is relevant because the stocks of companies have, "in their formation values, portions related to incentives associated with production (costs) and change the formation of BTD according to the realization or not of these stocks" (Piqueiras, 2010, p. 55).

It is considered that the residues of Equation 7 are the abnormal BTD , because they refer to BTD portion that cannot be explained by the variations in revenues and in tax losses, level of investments in tangible and intangible assets. The BTD portion that can be explained by these variables is considered as normal difference (normal BTD), and was obtained by the difference between total BTD and abnormal BTD .

For the sensitivity tests the BTD calculation formula specified in Equation 2 was replaced with those applied by Costa and Lopes (2015) for the Brazilian context to determine TI (Equation 8), total BTD (Equation 9), temporary BTD (Equation 10), and permanent BTD (Equation 11).

$$TI_{it} = \frac{CTE_{it}}{A_{it}} \quad (8)$$

In which:

CTE = Current Tax Expenses of company i in year t .

A = Maximum rate of income tax of company i in year t .

$$Total\ BTD_{it} = \frac{(EBT_{it} - TI_{it})}{ASSET_{it-1}} \quad (9)$$

In which:

EBT = Earnings Before Taxes of company i in year t .

$ASSET$ = total assets delayed of company i in period i in period $t-1$.

$$Temporary\ BTD_{it} = \frac{(CTE_{it} / A_t)}{ASSET_{it-1}} \quad (10)$$

In which:

CTE = Current Tax Expenses of company i in year t .

A = Maximum rate of income tax of company i in year t .

$ASSET$ = total assets delayed of company i in period i in period $t-1$.

$$\text{Permanent BT D}_{it} = \text{Total BT D}_{it} - \text{Temporary BT D}_{it} \quad (11)$$

Being:

Permanent BT D = Permanent difference between corporate income and fiscal income of company i in year t .

Total BT D = Total difference between corporate income and fiscal income of company i in year t .

Temporary BT D = Temporary difference between corporate income and fiscal income of company i in year t .

Equation 7 was used again for estimation of normal and abnormal portion of BT D, but this time we considered as response variable the BT D values found through application of Equation 9. The BT D magnitude found in sensitivity tests was also analyzed, assigning the positive BT D or negative BT D designations, as described in Equations 5 and 6.

REFERENCES OF THE SUPPLEMENTARY MATERIAL

- Agoglia, C. P., Doupnik, T. S., & Tsakumis, G. T. (2011). Principles-based versus rules-based accounting standards: The influence of standard precision and audit committee strength on financial reporting decisions. *The Accounting Review*, 86(3), 747-767.
- Costa, P. S., & Lopes, A. B. (2015). Implicações da adoção das IFRS sobre as book-tax differences: o caso do Brasil. Alemanha: NEA.
- Fávero, L. P., Belfiore, P. P., Silva, F. L., & Chan, B. L. (2009). *Análise de dados: modelagem multivariada para tomada de decisões*. Rio de Janeiro: Elsevier.
- Hanlon, M., Krishnan, G. V., & Mills, L. F. (2012). Audit Fees and Book-Tax Differences. *The Accounting Review*, 34(1), 55-86.
- Marques, A. V. C., Costa, P. S., & Silva, P. R. (2016). Relevância do Conteúdo Informacional das Book-Tax Differences para Previsão de Resultados Futuros: Evidências de Países-Membros da América Latina. *Revista Contabilidade & Finanças*, 27(70), 29-42.
- Martinez, A. L., & Passamani, R. R. (2014). Book-Tax Differences e sua Relevância Informacional No Mercado de Capitais No Brasil. *Revista de Gestão, Finanças e Contabilidade*, 4(2), 20-37.
- Piqueras, T. M. (2010). *Relação das diferenças entre o lucro contábil e o lucro tributável (book-tax differences) e gerenciamento de resultados no Brasil*. Dissertação de mestrado, Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo.
- Tang, T. Y. H. (2006). *The Value Relevance of Book-Tax Differences - An Empirical Study in China's Capital Market*. SSRN Electronic Journal.