



New Challenges in Accounting and Finance

2020(4)1–16



The Study of Tax Aggressiveness and Earnings Persistence and its Components

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Received 7 June 2020

Accepted 17 September 2020

ABSTRACT

This research aimed to analyze whether companies that present greater tax aggressiveness have different levels of persistence of earnings components. We measured tax aggressiveness by two proxies: i) book-tax differences and ii) effective tax rates. The study period was between 2010 and 2016, involving Brazilian companies listed on B3. The Effective Tax Rate metric classified the most tax aggressive companies. The results showed that companies, when segregated by levels of tax aggressiveness, present differentiated earnings persistence in its components. It is noted that, in most tax-aggressive companies, tax profit becomes a determining factor for book income in the future period. This work contributes to the accounting literature by identifying the impact of taxation on the earnings quality, particularly in the earnings persistence, a fundamental requirement for greater managerial and tax predictability and a greater direction of value for companies.

Keywords: Earnings Persistence, Tax Aggressiveness, Book-Tax Differences, Effective Tax Rates.

Introduction

Tax aggressiveness can be defined as the management of the tax base, which occurs via tax planning, which seeks to reduce explicit taxes through evasion and tax avoidance activities (Chen et al., 2010). Tax planning should not be regarded as an activity that provides for tax evasion a priori; it also takes advantage of legitimate exemptions and concessions provided for in the tax system in the search, among the legal methods available, the one that causes the lowest tax burden for the company (Martinez, 2017).

The complexity of tax rules and the interpretation of tax legislation can lead the inspection to have a different understanding from the decision-makers' understanding of the calculation and settlement of taxes (Hanlon, Maydew & Saavedra, 2014). In Brazil, tax aggressiveness is the cause of recurring concerns since there is a code-law legal structure.

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Doi: 10.32038/NCAF.2020.04.01



Companies in countries that have this legal structure seek at all times to reduce the tax impact prescribed by the legal system, exploring gaps in legislation to remove the tax burden (Desai, Dharmapala, & Fung, 2007).

In the Brazilian reality, given the regulatory peculiarities and the structure of financing public spending, corporations bear significant tax costs, which undermines the valuation of shares and negotiations between companies, as well as leading to greater risk in the provision of credit, which leads, in some cases, to stimulating tax evasion. According to Hasan et al. (2014), those who are creditors of a corporation, when they identify that a company is aggressive in taxation, impose higher interest rates, as they perceive a greater risk.

Regarding earnings, Hanlon and Slemrod (2007) suggest that the distribution of a larger amount of profits to shareholders is only possible if companies have a lower tax burden, i.e., the value of the shares will be higher to the extent that there is an expectation of a reduction in the tax burden. According to Sasso (2012), it makes sense to study the relationship between profit and tax burden. It is a reason for conservatism since the accounting results receive tax interference in determining the profit.

In this sense, Austin and Wilson (2013) argue that companies that have less tax aggressiveness are more concerned with investors and customers, and this justifies the act that many companies abstain from an aggressive stance in tax terms for fear of losing their reputation with their customers and investors. The authors also consider that major brand companies have higher tax levels due to this concern with market reputation.

In the case of tax aggressiveness, according to the research by Dunbar, Higgins, Phillips & Plesko (2010), there are two empirical proxies of a company: i) book-tax differences (BTD) and ii) effective tax rate (ETR). Regarding the application of ETR, Dunbar et al. (2010) claim that it serves as a basis for calculating tax aggressiveness, which relates to the company's earnings and taxes paid. The ETR metric will be used in this study to separate the most aggressive from the least aggressive companies.

Based on the previous discussion, this research follows the studies by Kajimoto and Nakao (2015) and Hanlon (2005), understanding that earnings, measured by Earnings Before Income Tax (EBIT), can be broken down into two components, BTD, and Taxable Profit. This is because these variables demonstrate the segmented profit between accounting and tax, a procedure that generates a "clean profit," observed by Kajimoto and Nakao (2015) and Hanlon (2005).

About the literature on the topic, there is research in Brazil that relate tax aggressiveness to various components, such as family businesses (Martinez & Ramalho, 2014), as the remuneration of the auditors (Martinez, Lessa, & Moraes, 2014), as third party capital (Martinez & Silva, 2017), as the future profitability (Martinez & Reinders, 2016) and also with components like BTD (Kajimoto & Nakao, 2015). Some works relate earnings persistence to components, such as earnings persistence and earnings management (Ferreira et al., 2012) and the life cycle of companies (Martinez & Bassetti, 2016). However, there was an absence of studies aligning tax aggressiveness and earnings persistence to verify the effects of tax aggressiveness on the earnings persistence components.

One of the reasons that motivates the investigation of the effects of tax aggressiveness and its impact on the earnings persistence is that, after the Enron and Worldcom scandals,

there was a fear by financial agents of manipulation of tax and accounting results, leading them to apprehension regarding the big differences between taxable and book income (Hanlon & Heitzman, 2010).

Another motivation for this study is to verify whether the levels of tax aggressiveness interfere with the persistence of profits and their components. Brazil is experiencing a time when more and more investors are entering the stock market, and there is a fundamental concern with tax avoidance practices, with its eventual abuse and with earnings management, aiming at an accounting result that reflects a faithful and fair image of the evolution of equity (Gomes, 2012).

With that said, the objective of this research is to identify whether companies that present a higher degree of tax aggressiveness have different levels of earnings persistence components. It is urgent to clarify that there is no control, here, of probable motivations for tax aggressiveness, but only its impact on one of the dimensions of the quality of book income. In order to operationalize this research, data were collected from companies listed in B3 (Brasil, Bolsa, Balcão – Brazil, Stock Exchange, Over-the-counter trade), between the years 2010 and 2016, mainly from data extracted from Economatica©.

Corroborating the ideas by Araújo et al. (2016), it stands out that there is little scientific research in the tax area in Brazil. In this perspective, this investigation intends to contribute to the literature regarding tax aggressiveness in the country, an important theme given the heavy tax burden imposed by the State and which, despite its international relevance, is still relatively little visited by academia and national literature.

Theoretical framework

Earnings persistence

The accounting literature defines that earnings are considered persistent when they spread over consecutive periods and in the same measure, without major fluctuations. According to Dechow, Ge, and Schrand (2010), companies that manage to make earnings with greater persistence can have a healthier profit-cash flow ratio. Those earnings are used for equity analysis. From a market perspective, earnings persistence is used by investors to identify healthy companies, as observed by Ghemawat and Rivkin (1999). These authors also claim that a company that obtains continuous superior profits within its domestic group of competitors has a competitive advantage. Unlike Ghemawat and Rivkin (1999), the study by Goddard and Wilson (1999) brings a distinct approach to earnings persistence research. Evidence from the studies by these authors indicates that companies that do not operate under more competitive conditions tend to present results with the same earnings rates, long term, and short term. Goddard and Wilson (1999) also consider that companies that operate under more competitive market conditions tend to persist in the short term, having a greater oscillation of this earnings persistence. Kajimoto and Nakao (2015), on the relationship between persistence and taxable earnings, claim that persistence is not one of the characteristics of taxable profit. This thinking leads to the understanding that taxable earnings do not consider earnings persistence in their execution and calculation.

Regarding earnings persistence and its variation, Nusser, Heckemeyer, Finke, Spengel, and Fuest (2013) claim that there is empirical evidence that the change in earnings occurs due to the impact it receives from tax revenues, being difficult to measure this change from

company to company due to the particularities of each one. However, it is plausible to consider that the losses are significant.

Tax aggressiveness

Amadasun and Igbinosa (2011) define that tax planning is like any other planning, is the moment when the company determines the elements that it will use to reach a goal, that is, the maximum tax benefits, subsidies, compensation, and the reduction of the tax burden. It is through this tool that a company achieves the improvement and reduction of the discretionary power of government agencies. Neto (2013) corroborates these ideas stating that tax planning gives economic freedom for the taxpayer to carry out, legitimately and protected by law, a set of legal acts that enable them to avoid, mitigate or prevent the birth of tax obligations. Vello and Martinez (2014) comment that tax management can be a competitive arsenal for today's organizations, since the tax cost today is very large for companies and since the inspection agencies have been increasingly equipped in search of efficiency in the inspection of tax evasion. According to Xavier (2016), it cannot be assumed that aggressive tax planning tends to generate tax evasion; the law is not contrary to the majority; however, there will be an interpretation of the law different from that envisaged by the legislator and the government in its preparation. Tôrres (2001), in line with Xavier (2016), ponders that planning cannot and should not be seen by inspection bodies as purposeful tax aggressiveness because only the effective practice of tax evasion can be subject to sanctions. About tax costs, Dalfior (2015) states that, for the most part, earnings management practices impact companies' tax costs, and exemplifies this idea: when the company wants to attract investors, earn without disclosures or obtain foreign credits, it takes on an increase in its taxes derived from earnings management. In turn, when that same company wants to reduce the tax burden, it manages results downwards.

Desai et al. (2007) consider that in emerging countries, such as Brazil, inspection and tax burden would influence the equipment and tax adequacy of organizations, with this, there is a tendency to tax evasion.

It is important to mention that the relationship between earnings persistence, BTD, and tax aggressiveness gains special meaning in Brazil due to its peculiar code law structure (Martinez & Reinders, 2016). About this legal structure, Kvaal and Nobes (2013) consider that countries such as France and Japan, as well as other countries that use the code law structure, have greater requirements for a mismatch between accounting and tax profits, which generates larger BTDs and distances the market view in these code law countries, the common law view is more practiced in countries like the United States and Australia, where there are lower levels of BTD and a greater market view for companies in their accounting and tax practices. Kolozsvari and Macedo (2016) confirm that tax easing directly influences earnings persistence, thus reducing the quality of accounting information, increasing its variability, and causing investors to make unsustainable decisions. Regarding earnings quality, it can be said that it suffers due to the agency theory; the more persistent earnings demonstrate a more continuous income. However, this result is not always better than that of other companies. Hence, managers want to increase their accounting results, as for the tax authorities, and investors prefer a greater balance between accounting profit and taxable profit, demonstrating higher earnings quality (Machado & Nakao 2012).

Pinho and Costa (2008a, 2008b) found that, unlike international surveys, national results around the earnings persistence and quality showed that there is no standard behavior among these. It is possible to consider that tax aggressiveness can interfere in these two indicators, both in persistence, the reason for this study, and the earnings quality, which may constitute a proposal for future study. Still on earnings quality and the impact of legislation on it, Lopes and Walker (2008) affirm that in countries where there is less strict legislation, companies can have a longer lifespan, without the presence of managers interfering in the results, thus generating better earnings quality disclosed by the companies.

Book-tax differences

The difference in the calculation between book income and taxable income is often known as book-tax differences (BTD). The existence of BTD occurs due to several factors, the most basic of which is that profit systems follow different modes of measurement and presentation since their objectives are not homogeneous (Hanlon & Heitzman, 2010). Ferreira et al. (2012) claim that while book income, as demonstrated by the Generally Accepted Accounting Principles (GAAP), is calculated and used by the manager in the decision-making process, taxable profit follows government precepts, adjusting the tax legislation issued by the government. Further on this, Formigoni, Antunes, and Paulo (2009) affirm that there is a certain adaptation and governmental requirement for the systems (business software) to generate information that can be used by both users, supervisors, or investors. Thus, when the government uses such data for tax calculation of taxes, companies are influenced to manage in order to reduce the tax burden. In the search for greater smoothing than the taxation of earnings with a view to equity, Ayers, Laplante, and Mcguirre (2010) diagnosed ways to smooth taxable profit. In this sense, Graham and Smith (1999) concluded that the tax tables are progressive. The treatment between loss and taxable profit is asymmetric and, finally, that profit smoothing is little encouraged. Reflecting on the case of Brazil, the emergence of BTD is due to the difference in legislation in force, and Law no. 9.249/1995 and Decree no. 3.000/1999 – RIR/99 determine the parameters that companies should use to generate tax income. Law no. 6.404/1976 and Law no. 11.638/2007 determine the parameters companies should use to generate book income.

Hypothesis development

In the research carried out by Jackson (2015), it was observed that BTD, for entities that do not have an attitude of tax aggressiveness, are less negative than for companies that have tax aggressiveness. The results by Martinez and Reinders (2016) corroborate the results by Martinez and Ramalho (2014) concerning the fact that the most tax-aggressive companies are the smallest and that the largest ones have the least degree of tax aggressiveness. Therefore, as smaller companies grow, they become less aggressive. Martinez and Reinders (2016) and Martinez and Ramalho (2014) affirm that the biggest companies need to show credibility to the market having earnings persistence as one of the indicators, and as it is intended to demonstrate in this research, the greater the tax aggressiveness, the less persistent the earnings.

The research by Scholes and Wolfson (1992) states that more important than reducing the tax burden is to increase the return and value of the company for all involved, which

creates greater credibility for investors. These thoughts contribute to the presentation of the hypothesis of this research: **H₁**: Companies with greater tax aggressiveness have different levels of earnings persistence components.

Methodology

Sample population and selection

Table 1 shows the sample selection and formation process. The research procedures presented were performed in the Economática® database, which gathers information from the financial statements of companies that trade their shares in B3. It is noted that the observations, initially quantified at 6,958, after the tabulation and organization procedures, they were reduced to a total of 1,631 observations, totaling a group of 18 economic sectors.

Table 1. Observation selection process

<i>Loss of data</i>		
<i>Initial Observations</i>		6958
(-)	Financial Sector Companies	749
(-)	EBIT = 0	2627
(-)	Assets < 0	5
(-)	Provision for income tax (t-1)	397
(-)	Provision for income tax	254
(-)	ROA < 0	1295
<i>Final observations</i>		1,631

Source: Authors' own elaboration.

From this sample, observations from related economic sectors were extracted, including the financial and insurance sectors. This procedure is usually in tax research because it considers different rates and treatments, according to Kajimoto and Nakao (2015), Ferreira et al. (2012), Machado, and Nakao (2012), Martinez, Lessa, and Moraes (2014). They adopted the usual exclusion criteria in development and studies related to the theme. This research, therefore, suppressed the information of financial entities. However, it is possible to compare them with themselves and verify, even if the financial companies have greater or lesser tax aggressiveness than the non-financial ones and if this impacts on the earnings persistence. During data collection, it is emphasized that there was a manual search in the indexes and financial statements of companies listed in B3, of information not extracted directly from Economática® on B3, Economática® does not filter data from years before the company enters B3, so these had to be collected directly, thus improving the treatment and selection of the sample and refining the data in order to prevent losses.

Variables and empirical model

Data collection was carried out with the Economática® software database, extracting from it the following data that constitute the dependent and independent accounting variables that make up this work: (1) corporate net income before tax (EBIT), (2) tax expenses (income tax and social contribution on net income), (3) companies' total assets, as shown in Table 2.

Table 2. Composition of research variables.

<i>Variables</i>	<i>Acronyms</i>	<i>Formulas</i>
<i>Effective tax rate</i>	ETR _{i,t}	$ETR_{i,t} = \frac{Tax\ Expenses_{i,t}}{EBIT_{i,t}}$
<i>Book-tax Differences</i>	BTD _{i,t}	$BTD = Book\ Income - Tax\ Income$
<i>Profit</i>	Profit _{i,t}	$Lucro_{i,t} = LUC\ FISCAL_{i,t} + BTD_{i,t}$
<i>Taxable Income</i>	TAX INCOME _{i,t}	$Taxable\ Income = (provision\ for\ IR/CSLL)/0.34\ (non-financial)\ or\ 0.40\ (financial)$
<i>Company size</i>	SIZE _{i,t}	<i>Total Assets</i> (in logarithm)
<i>Return on Assets</i>	ROA _{i,t}	$ROA = Net\ income/Total\ Assets$

Source: Authors' own elaboration.

Table 2 shows the control variables ROA and SIZE, from a study on what can influence earnings persistence and tax aggressiveness, according to Shevlin, Edwards, and Schwab (2013), Zimmerman (1983), Silva (2016), Martinez and Silva (2017). They used such data as variables in their scientific productions. The variable ETR in Table 2 is used as a metric for separating companies with greater tax aggressiveness. Table 3 sought to measure the ETR levels of financial and non-financial companies and the two listed in the same variable.

Table 3. Tax rate of companies in the sample

<i>Percentage</i>	<i>Non-financial</i>	<i>Financial</i>	<i>Financ. & Non-Financ.</i>
	<i>ETR</i>	<i>ETR</i>	<i>ETR</i>
10	0.0228840	0.0000000	0.0196768
20	0.0840746	0.1016953	0.0857407
30	0.1311162	0.1658020	0.1365974
40	0.1724835	0.2117590	0.1798804
50	0.2171711	0.2521047	0.2237465
60	0.2609993	0.2955734	0.2675422
70	0.2963786	0.3416071	0.3041779
80	0.3348919	0.3874124	0.3419763
90	0.3889142	0.4579710	0.4165671
100			

Source: Authors' own elaboration.

From Table 3, an important investigation carried out in this work can be extracted: the separation of financial and non-financial entities, to demonstrate the results avoiding bias. It can be said that, of the total sample, 390 observations are from financial companies, and 1,631 are from non-financial companies, with a total of 2,021 observations used in Table 3. Table 3 also shows that up to 50% of financial companies have an effective tax rate below 25.21% and that of non-financial companies, 50% are below 21.71%, and finally, in the union between these two sectors, 50% of the sample companies have a maximum ETR of 22.37%. Such results, even before the tests, already suggest tax aggressiveness, as the tax rates (national statutory rates) are 34% for non-financial companies and 40% for financial companies.

The average test was also carried out, which obtained a 25.97% effective tax rate for financial companies, 22.98% for non-financials, and 23.65% for total observations, involving financial and non-financial. Thus, through the conducted surveys, it can be inferred that, from Table 3, all companies that pay up to 50% of the ETR found pay below the statutory tax rate of 34% and still pay less than the average ETR for their sector. In this study, seeking to obtain information on performance indicators in the capital market B3, the variables shown below were used, and initially, the original equation (1) is presented. After presenting the derivation of this equation, we demonstrate, through Equation (3), its new formation with the earnings components.

Equation 1.

Persistence test

$$PROFIT_{i,t+1} = \beta_0 + \beta_1 TAX\ INCOME_{i,t} + \beta_2 BT D_{i,t} + ROA_{i,t} + SIZE_{i,t} + \varepsilon_{i,t} \quad (1)$$

So in order to reach Profit_{i,t} we carry out the tests set out below using linear regression that obtains the data for the profit components shown below that are derived from Equation 1:

Equation 2.

Calculation formula of the profit component at the current time – Profit_{i,t}:

$$PROFIT_{i,t} = TAX\ PROFIT_{i,t} + BT D_{i,t}$$

To apply the research test, the model that will be estimated to test whether companies have different persistence levels than other companies is:

Equation 3.

$$PROFIT_{i,t+1} = \beta_0 + \beta_1 TAX\ FISCAL_{i,t} + \beta_2 BT D_{i,t} + \beta_3 TAX\ INCOME_{i,t} \\ * DUMMY\ ETR_{i,t} + \beta_4 BT D_{i,t} * DUMMY\ ETR_{i,t} + ROA_{i,t} + SIZE_{i,t} + \varepsilon_{i,t}$$

Equation 4 was used to calculate the ETR, which in this research will be one of the drivers for calculating the effective tax rate collected by companies:

Equation 4.

$$ETR_{i,t} = \frac{Tax\ Expenses_{i,t}}{EBIT_{i,t}}$$

The use of ETR in the calculation of the effective taxation of the company is based on the existing literature, such as Tang (2005), Formigoni et al. (2009), Yin (2003), Rego (2003); Minnick and Noga (2010) and Armstrong et al. (2011).

Results

Descriptive statistical analysis

In this first part of the study, descriptive statistics are presented, as shown in Table 4, extracted from the research sample:

Table 4. Descriptive statistics

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
$PROFIT_{i,t+1}$	1,631	.0909161	.0806045	.0001784	.3479468
TAX INCOME	1,631	.0586423	.0667611	0	.2871338
BTD	1,631	.0210126	.0541932	-.136404	.1547003
DY TAX INCOME	1,631	.041579	.0590662	0	.2871338
DY BTD	1,631	.0212154	.0506818	-.136404	.1547003
ROA	1,631	7.03654	6.094532	.3	26.5
SIZE	1,631	14.34721	1.885883	9.56374	17.72717

Source: Authors' own elaboration

The results demonstrate, in all variables, the number of observations already exposed, 1,631. Regarding the variable TAX INCOME, it has a mean of 0.0586423. In contrast, $PROFIT_{i,t+1}$, - which is the profit for shareholders – presents its mean results around 0.0909161; this suggests the basis on BTD of different accounting views due to a country's tax structure, which may be aimed at shareholders or at reducing the tax burden.

The data mentioned above show that the independent variables – TAX INCOME, BTD, DYTAX INCOME, DY BTD - and dependent - $PROFIT_{i,t+1}$ - present little dispersion of the average, which is within the acceptable.

Correlation analysis

Table 5 shows the Pearson correlation coefficients, according to Moore (2007), where the degree of the linear relationship between two variables is measured, and its direction is analyzed by correlation; therefore, it can be said that the test aims to obtain the result of the correlation measure for two variables linearly.

Table 5. Correlation matrix

	$PROFIT_{t+1}$	TAX INCOME	BTD	DY TAX INCOME	DY BTD	ROA	SIZE
$PROFIT_{t+1}$	1.0000						
TAX INCOME	0.6252*	1.0000					
BTD	0.1773*	-0.0403	1.0000				
DY TAX INCOME	0.5426*	0.7047*	0.0922*	1.0000			
DY BTD	0.1932*	-0.0223	0.9368*	0.0957*	1.0000		
ROA	0.9605*	0.5285*	0.2175*	0.4870*	0.2382*	1.0000	
SIZE	-0.1985*	-0.0628**	0.0241	-0.0792*	0.0229	-0.2106*	1.0000

Note: Significance: *1%, **5% and ***10%.

Source: Authors' own elaboration

In the analysis of Table 5, it is observed that the variable profit in the future tends to show a great positive correlation, 0.6252, with the tax profit variable; that is, it can be said that profits are significantly associated with 1% and continuous in the present and the future, is directly proportional to their relationship. As for the second independent variable, BTD, it has a small positive relationship, with a result of 0.1773 with the variable dependent on the model. It can be observed that all the independent and control variables used are significant for association with the dependent variable of the model.

Benchmarking model analysis

The benchmarking model presents a model already tested with some further or different information from the previous test. In this research, we used as a model for benchmarking

Martinez and Bassetti (2016), who tested the models by Hanlon (2005) and Drake (2013); then, it can be said that we test the international literature applied to Brazil. The model tested the data robustly, and this test also adopted the same exclusion and test procedure, seeking to avoid heterogeneity, with some adjustments. In the previous test, a sample from 2009 to 2013 was used, and the most updated test, the period from 2010 to 2016. It was not possible to identify whether the previous test deflated the data. However, the tax aggressiveness test carried out in this research deflated the data by total assets, and, at the end of the test, a control variable, ROA, was included. The tests are shown in Table 5, with the variable ROA added.

Table 6. Lagged EBIT test concerning EBIT and ROA

<i>Variables</i>	<i>Coefficient</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P-Value</i>
<i>EBIT</i>	.0439793	0.168408	2.61	0.009*
<i>ROA</i>	.0116904	.0004486	26.06	0.000*

Note: Significance: *1%, **5% and ***10%.

Source: Authors' own elaboration.

In redoing the tests by Martinez and Bassetti (2016) and by Hanlon (2005), it is possible to affirm that the current profit explains the future profit because the test result was significant, which shows that, on this aspect, national and international literature agree. Then, we also did a test similar to that by Martinez and Bassetti (2016) and Drake (2013), and the results are shown in Table 7.

Table 7. Future EBIT test in relation EBIT, DY EBIT, and ROA

<i>Variables</i>	<i>Coefficient</i>	<i>Standard Deviation</i>	<i>T Statistics</i>	<i>P-Value</i>
<i>EBIT</i>	.0425391	0.0208118	2.04	0.042**
<i>DY EBIT</i>	.0018901	0.0205284	0.09	0.927
<i>ROA</i>	.011686	.000472	24.76	0.000*

Note: Significance: *1%, **5% and ***10%.

Source: Authors' own elaboration.

From this second test, we obtained the result that the national literature does not match the international one; the results were similar to those by Martinez and Bassetti (2016), who included a life cycle dummy in their research, unlike Drake (2013). The results shown in Table 7 show that, when the ETR tax aggressiveness variable is included in the interaction with EBIT, there is no significance to say that the more aggressive the entity, the lower the earnings persistence. The reasons that lead to this situation will be addressed when we talk about the interaction between the components, which constitutes the test of the hypothesis of this research.

Analysis of the regression model

To obtain the results and test the hypothesis model, two estimates were made. The first referred to the earnings persistence through its components. The second estimate is related to the interference of tax aggressiveness in the components of earnings persistence. Aiming to obtain the results of the first estimation, we take as a basis the studies by Hanlon (2005), reapplying its regression model and replacing Pre-Tax Book Income (PTBI) for Earnings

Before Income Tax (EBIT), according to Table 8. The results achieved were similar to those Hanlon (2005) found, which suggests that national literature and practices are similar about profit measures without aggressiveness. The results also point out that the research already carried out in Brazil, as by Martinez and Bassetti (2016), according to the benchmarking test presented in Table 6, identified that current earnings can explain future earnings and that the relationship between these is positive and significant. The differential of this research is that, in the first test, while Martinez and Bassetti (2016) used the period from 2010 to 2013, we investigated the period from 2010 to 2016. The authors also did not use the control variables to generate the reports, while in this study ROA and SIZE were used as control variables. Finally, the profit was divided into two components, TAX INCOME and BTD; thus, we tested not only profit against profit (EBIT at the current time versus EBIT at the previous time), as in the research cited.

Table 8. Regression $Profit_{i,t+1}$ concerning TAX income, BTB, ROA, and SIZE

Variables	Coefficient	Standard Deviation	T Statistics	P-Value
TAX INCOME	.0572855	.0143554	3.99	0.000*
BTD	.0374469	.0124683	3.00	0.003*
ROA	.0118392	.0001347	87.89	0.000*
SIZE	.0082523	.0014946	5.52	0.000*

Note: Equation (1) $Profit_{i,t+1} = \beta_0 + \beta_1 TAX INCOME_{i,t} + \beta_2 BTB_{i,t} + ROA_{i,t} + SIZE_{i,t} + \epsilon_{i,t}$

Significance: *1%, **5% and ***10%.

Source: Authors' own elaboration.

When analyzing the coefficients and the confidence level between the independent variable TAX INCOME, which is one of the components of profit, and the dependent variable Future earnings, it is observed that the independent variable is significant at 1% and brings a coefficient of 5.7%, which appears as a positive relation in the results. Regarding the independent variable BTB in relation to the dependent variable Future earnings, it presents results with a p-value of 0.003, that is, significant positive BTB in Table 8, it is explained that when BTB increases by 1% in period t-1 there would be, in period t, an average increase of 3.7% in BTB in relation to $Profit_{i,t+1}$. Results were also found regarding the estimation of the average ETR through descriptive analysis of the fact that financial entities have an average tax burden of 25.97% and that non-financial entities have an average tax burden of 22.98 %, being that when together, both have an average of 23.65% as a tax burden. With the calculation of the ETR, one can express the calculation of the most aggressive tax companies, where 1 is more aggressive, and 0 is less aggressive because it is greater than the tax burden. In other words, this work used the existing standard rate as tax burden, 34% for non-financial entities, and 40% for financial entities to find the ETR of each company, and after that applied the median, making the result as close to reality. Table 9 shows the results of the main research estimation.

Table 9. Regression $Profit_{i,t+1}$ in relation to TAX INCOME, BTD, DY TAX INCOME, DY BTB, ROA and SIZE

Variables	Coefficient	Standard Deviation	T Statistic	P-Value
TAX INCOME	.0405998	.0169347	2.40	0.017**
BTD	.0721077	.0275483	2.62	0.009*
DY TAX INCOME	.0247078	.0131461	1.88	0.060***
DY BTB	-.0421459	.0301836	-1.40	0.163
ROA	.0082849	.0001377	85.84	0.000*
SIZE	-.1151244	.0014928	5.55	0.000*

Note: Equation (3) $Profit_{i,t+1} = \beta_0 + \beta_1 TAX INCOME_{i,t} + \beta_2 BTB_{i,t} + \beta_3 TAX INCOME_{i,t} * DUMMY ETR_{i,t} + \beta_4 BTB_{i,t} * DUMMY ETR_{i,t} + ROA_{i,t} + SIZE_{i,t} + \epsilon_{i,t}$

Significance: *1%, **5% and ***10%.

Source: Authors' own elaboration.

The results shown in Table 9 represent the test of the effects of companies with greater fiscal aggressiveness concerning earnings persistence, using their components. The interaction between the independent variables TAX INCOME was made with the dummy ETR and BTB with the dummy ETR, which, as already explained, serves to separate the most aggressive from the least aggressive companies, generating the variables DY TAX INCOME and DY BTB, respectively, according to Table 9. The results for the explanatory variables in terms of the coefficients are contrary to the international literature by Hanlon (2005). Tax profit, when interacting with ETR, showed that the greater the tax aggressiveness, the greater the earnings persistence in a small ratio of 4.05%. In this work, a 10% significance level was obtained in the test.

As for DY BTB, which is the second variable independent of the model with tax aggressiveness, when this interaction with the ETR, the results found in terms of coefficients were statistically negative; the higher the BTB, the lower the earnings persistence. However, when analyzing the p-value of DY BTB to measure its level of significance concerning future earnings, the result was 0.163, which leads to the rejection of the hypothesis that DY BTB interferes with the persistence of future earnings, considering that BTB's interaction with ETR is in accordance with the tests performed, it is not relevant to the earnings persistence. The effects achieved from the relationship between independent variables with tax aggressiveness were not shown to be significant in the persistence of lagged profit in all variables; that is, it cannot be said that Brazil's results are similar to those of international literature, such as Hanlon (2005) and Drake (2013). One of the explanations for this differentiation of the results of the main regression in relation to international literature is the Brazilian legislative structure, which is much more rigorous than in developed countries; thus, it is suggested that not only the most aggressive taxes will have lower earnings persistence. It can be observed that TAX INCOME and BTB are persistent in explaining future earnings by current earnings with statistically positive coefficients when analyzing the results in Table 9. All of this suggests that when these results are inserted in tests with variables with tax aggressiveness in the profit components both, TAX INCOME and BTB manage to maintain significance by reinforcing theories by Kvaal and Nobes (2013) and Martinez and Reinders (2016), when they deal with the behavior of countries with a code law structure.

Conclusion

This article sought to identify whether companies with a higher degree of tax aggressiveness have different earnings persistence components, specifically: i) book-tax differences (BTD) and ii) tax profit. Positive coefficients were obtained for the earnings components, attesting to the findings by Martinez and Silva (2017), Martinez and Bassetti (2016), Hanlon (2005), and Drake (2013). Thus, it was evidenced that, in the appreciation of the earnings components, the tax profit is more significant to explain the future book income in the context of tax-aggressive companies. The results of the main test with aggressiveness showed a different effect between tax profit and book income in terms of persistence. A possible explanation for this phenomenon is the recent tax changes in Brazil and the transition process to international accounting standards, during which significant changes occurred in the accounting calculation process. In the tests, tax aggressiveness was classified based on the median of ETR observations and not by the national statutory rate (34%); thus, it was possible to notice that the results are more significant than when realized by this second methodological option. This indicates that companies that are, in most cases, tax aggressive and that the more tax aggressive, the greater the difference between their persistence levels of the earnings components.

This research also brought an important survey not observed in other researches: the tax burden of the companies was presented in a percentage of 10 to 100 and how much is the average burden of these same companies. The results showed that the Brazilian companies listed in B3 in the sampling period have a lower tax burden than the average, that is, are below the national statutory rate (34%) for taxes on book income. An important and unprecedented result in the national literature is the segregation of profit components: tax profit and BTD. It was noted that tax profits show persistence levels of profits below those of book income.

Among the limitations of this study, we highlight the exclusive use of ETR as an empirical proxy to classify the degree of tax aggressiveness of firms. The work also leaves the gap for using the persistence model in the period beginning in 2010; however, this methodological option was intended to focus on the years after adopting IFRS. The study contributes to the tax accounting literature in Brazil, where there are still few scientific and empirical studies on the subject. We hope that this research will provide a stimulus for future studies on the subject, improving the discussions and debates on the topic related to the effects of taxation on earnings quality. Equally, there is an expectation and that the results documented here will be of value to the capital market in analyzes for decision making by external users.

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