

EFFECT OF TAX AGGRESSIVENESS ON CEO TURNOVER**Antonio Lopo Martinez***Outras/Universidade De Coimbra (portugal)***Flávio Oliveira Brito***Fucape Pesquisa Ensino E Participações Limitada***Viviane Ferreira De Oliveira Chiachio***FundaçãO Instituto Capixaba De Pesquisas Em Contabilidade, Economia E FinanÇas***Resumo**

This study verifies the influence of corporate tax aggressiveness on the replacement of the Chief Executive Officer ? CEO. The central hypothesis is that managers` tax risk tolerance can be a determinant of CEO turnover in companies listed on the Brazilian stock exchange B3. An efficient tax planning is essential for any organization, being a management duty to avoid paying unnecessary taxes, so the willingness to take tax risks may influence the permanence of the CEO in its role. The research confronts the CEO turnover with three metrics of tax aggressiveness, in the period from 2010 to 2016, ranking results by quintile and identifying the high and low extremes. Control variables reduce the bias of the proposed regression. In two proxies, cash effective tax rate and long-run effective tax rate, there were significant results for low tax aggressiveness and higher CEO Turnover. The results evidence that less tax aggressive CEOs are more likely to be replaced in Brazilian public companies. For managers, the findings reinforce that tax planning and the managers` tax risk tolerance are determinant factors to remain in the position. The results provide some wisdom about the tensions surrounding managers` behavior. Unlike securities misconduct, which harms shareholders` interests, the low level of tax aggressiveness gives rise also to adverse effects to CEOs in line with the shareholder-centric view that minimizing tax payments increases firm value. With this perspective, the results provide valuable insights for policymakers, regulators, and tax authorities who aim to understand the incentives and disincentives that either drive or deter corporate tax avoidance.

Palavras-chave: Tax Aggressiveness; CEO turnover; Chief Executive Officer; Effective Tax Rate.

EFFECT OF TAX AGGRESSIVENESS ON CEO TURNOVER**ABSTRACT**

This study verifies the influence of corporate tax aggressiveness on the replacement of the Chief Executive Officer – CEO. The central hypothesis is that managers' tax risk tolerance can be a determinant of CEO turnover in companies listed on the Brazilian stock exchange B3. An efficient tax planning is essential for any organization, being a management duty to avoid paying unnecessary taxes, so the willingness to take tax risks may influence the permanence of the CEO in its role. The research confronts the CEO turnover with three metrics of tax aggressiveness, in the period from 2010 to 2016, ranking results by quintile and identifying the high and low extremes. Control variables reduce the bias of the proposed regression. In two proxies, cash effective tax rate and long-run effective tax rate, there were significant results for low tax aggressiveness and higher CEO Turnover. The results evidence that less tax aggressive CEOs are more likely to be replaced in Brazilian public companies. For managers, the findings reinforce that tax planning and the managers' tax risk tolerance are determinant factors to remain in the position. The results provide some wisdom about the tensions surrounding managers' behavior. Unlike securities misconduct, which harms shareholders' interests, the low level of tax aggressiveness gives rise also to adverse effects to CEOs in line with the shareholder-centric view that minimizing tax payments increases firm value. With this perspective, the results provide valuable insights for policymakers, regulators, and tax authorities who aim to understand the incentives and disincentives that either drive or deter corporate tax avoidance.

Keywords: Tax Aggressiveness; CEO turnover; Chief Executive Officer; Effective Tax Rate.

1 INTRODUCTION

Studies show that some companies maintain effective low tax rates for a long time, while others maintain consistent rates that meet or exceed the statutory or legally anticipated rate (Dyreng, Hanlon & Maydew, 2008; Blouin, 2014). For these authors, this behavior can be attributed, at least in part, to the CEO and their sensitivity to fiscal risk. Other studies reveal that reputational costs are limiting factors, determining how far businesses and managers are willing to minimize their effective tax rates (Desai & Dharmapala, 2006; Cheng, Huang, Li & Stanfield, 2012).

The tax issue may lead to changes in corporate leadership, influencing, for instance, a board's decision to replace the company's CEO. In this context, this research intends to empirically verify if companies' tax aggressiveness influences CEO turnover in Brazilian companies. The objective of this study, therefore, is to identify whether high or low tax aggressiveness explains, in part, the replacement of CEOs in companies listed on the Brazilian stock exchange B3.

Similar research by Chyz and Gaertner (2018), applied to the North American market, found evidence that CEOs bear reputational penalties to avoid paying taxes. Also, the authors observed that CEOs who are not enough tax aggressive are more likely to be replaced. The studies by Armstrong, Blouin, and Larcker (2012), Rego and Wilson (2012), Gaertner (2014) and Powers, Robinson, and Stomberg (2016) found relationships between CEO compensation and tax aggressiveness in US companies. Graham, Hanlon, Shevlin, and Shroff (2013) found that reputation costs (often referred to as non-tax related costs) are important factors that limit CEOs tax aggressiveness, which is corroborated with evidence produced by Hanlon and Slemrod (2009) and Graham et al. (2013).

The research by Hanlon and Slemrod (2009) support the idea that stock prices are negatively impacted when there is news that companies participate in transactions in tax havens.

Shareholders (and board members) want managers to adopt the best tax planning, balancing the benefits between tax avoidance and the costs generated by this practice.

There are no studies in Brazil examining the relationship between tax aggressiveness and CEO turnover. The hypothesis is that highly tax-aggressive CEOs would be more likely to be replaced since they bring an excessive tax risk to the company, which can be expressed in fines. However, the CEO who tolerates significant tax burdens by reducing profitability would also be exposed to a replacement, due to negligence in dealing with tax issues. The particularities of Brazil suggest the need to replicate the research carried out in the American market. The application of such experiments in the Brazilian context, marked as an emerging capital market with legal constraints (substantially different from the American reality), can bring completely different results. Therefore, this study gains importance not only because of the originality when addressing a context that is different from the USA, but also because it may inspire other researchers to examine emerging markets on the issue.

Methodologically, the study used three metrics of tax aggressiveness, classifying the results by quintile, and identifying the high and low extremes of tax aggressiveness. Additionally, control variables were used to determine other possible effects on the dependent variable. The research collected data from the software *Economática* and online platform of the BM&FBOVESPA.

This study is divided into five parts, including this introduction. The next section presents the theoretical framework, introducing a literature review. The third section shows the methodology adopted, followed by the analysis of the results obtained with the regression, the implication of results and the conclusion.

2 THEORETICAL FRAMEWORK

2.1 Tax aggressiveness

In recent years, studies on tax aggressiveness have increased significantly worldwide (Lee & Yoon, 2020). There are, however, relevant gaps to be filled (Hanlon & Heitzman, 2010), particularly in Brazil where research in this area and focused on Brazilian companies is in its early stages (De Macena Araújo et al., 2018).

There is no definition in Brazilian law or other administrative regulations regarding the definition of legal, illegal (abusive) or aggressive tax planning (Schoueri & Galendi Júnior, 2017). Companies always have doubts about what can be done when it comes to reducing, delaying, or avoiding the incidence of taxes. In Brazil, there is a particular legal uncertainty due to a confusing interpretation of tax authorities that can classify tax planning practices as simulation and fraud (Martinez & Coelho, 2016).

For companies and shareholders, excellent tax planning includes the reduction of tax costs, which reflects an increase in cash flow and net income (Blouin, 2014). The primary purpose of tax planning is to reduce tax obligations. The extent of tax aggressiveness will depend on the level of intensity and legality of how these practices are adopted, reflecting a significant reduction in explicit taxes (Martinez, 2017).

Hanlon and Heitzman (2010) define tax aggressiveness as the set of practices that reduce or avoid taxes, resulting in tax benefits. This approach does not distinguish legal from illegal, fraudulent, or legally dubious tax practices, but it exposes the company to the risks related to the tax agent interpretation.

More tax aggressive companies use every opportunity to obtain tax reduction. When these operations are under legal uncertainty or open to interpretation, the firms tend to opt for more advantageous tax practices, seeking tax savings, even though tax agents may interpret the practices as abusive, which represents a legal risk (Martinez, 2017).

Some studies on the reasons to engage in aggressive tax planning, point to elements such as the corporate policy regarding bonuses to executives (which leads to strategies to increase profit in order to raise their bonus gains), and the policy of paying executives with stocks (which leads them to take higher risks seeking to obtain higher returns) (Francis, Hasan, Qiang & Meng, 2014). According to Bertrand and Schoar (2003), the management of incentives to executives tends to influence the companies' tax aggressiveness.

According to Martinez (2017) greater tax aggressiveness does not imply tax abuse. However, there are risks that a sharp reduction in explicit tax obligations may indicate the use of controversial or illegal practices. In Brazil, the recognition of abusive tax planning is subject to debate. Brazilian law consists of distinguishing tax evasion (simulated schemes) from authentic tax planning. However, what is observed in administrative courts such as the Administrative Tax Appeals Council (CARF) are decisions about tax cases where the council focuses on the form and the use of practices that seem to "abuse of law" in some tax cases judged by CARF (Schoueri & Freitas, 2010). Lopo Martinez and Oliveira (2019) argue that as tax aggressiveness increases, so does the risk that tax authorities may disregard certain transactions.

2.3 Proxies to measure tax aggressiveness

Many articles have developed metrics to assess tax aggressiveness, most of them focusing on explicit taxes, regardless of whether the tax outcome is too aggressive or legally controversial (Brown, 2011; Hanlon & Heitzman, 2010; Lisowsky, 2010; Wilson, 2009).

Martinez (2017) points out that metrics of tax aggressiveness are focused on the company's accounting results, which in Brazil are based on revenue taxes (IRPJ) and the contribution on net profit (CSLL) (both taxes levied on profit). When considering that Brazil adopts a variety of direct and indirect taxes, the fact that studies only analyze taxes based on profit narrows the relevance of their conclusions.

The research by Frank, Lynch, and Rego (2009) adopt the Book-Tax Differences (BTD) – the result of the difference between accounting profit and tax profit – as a measure of tax aggressiveness. However, BTD is a biased measure since earnings management has a strong influence on the proxy's results (Ferreira, Martinez, Costa, & Passamani, 2012).

According to Hanlon & Heitzman (2010), the most widely used proxy for tax aggressiveness is the effective tax rate on accounting profit (ETR), which verifies the total expense with income tax, divided by the profit before income tax. A low ETR indicates that the company is more tax aggressive. Medeiros and Costa (2017) recommend an adjustment to the ETR that is more compatible with the Brazilian reality, where profit before income tax is added by the reversal interest rate on capital (registered against net equity as determined by Brazilian securities commission (CVM) – Resolution 207/1996) and the adjustments regarding the equity equivalence.

A metric adopted in this research is the Total Value Added Tax (TVAT), which is the product of the tax of the value-added statement (VAS) divided by the total value added to distribute. This is a Brazilian metric, with no comparison with international studies (Martinez & Silva, 2018). This metric is part of the VAS and is different from the most common international metrics in the market, which only use data from the income statement. It is a metric that enables capturing a broader result of tax aggressiveness in comparison to the ETR proxy. It measures aggressiveness in several aspects since it works with all the taxes (federal, state, and local) levied on sales (Fernandes, Martinez, & Nossa, 2013). According to Martinez (2017), TVAT is better than the traditional ETR, even though it has limits. For instance, TVAT includes indirect taxes, and many of them are passed on to the consumer.

2.4 CEO turnover

Although the Brazilian stock market is small and its ownership is more concentrated, it is possible to observe a tendency of replacement in the companies' leadership when performance is considered insufficient (Matos & Colauto, 2017). CEO turnover is related to internal monitoring by companies' shareholders, controllers, and creditors (Mellone Júnior & Saito, 2004).

Companies that have adequate governance structure, counting on the disciplining power exercised by a board of directors, are more likely to replace low-performing executives (Mendes-da-Silva & Grzybovski, 2006). There are also evidence that higher-indebted organizations present higher CEO turnover (Dani, Carmosa, & Hein, 2015).

Companies with an independent board or that adopt a fully independent nominating committee, significantly increase their CEO turnover when the executives fail to achieve the expected performance (Guo & Masulis, 2015).

There are several studies in international literature addressing the issue of CEO turnover:

ARTICLE	RESULTS	REFERENCE
Turnover threat and CEO risk-taking behavior in the banking industry	CEOs of the World Bank increase risk-taking when there is a moderate turnover threat and reduce risk-taking when they observe a higher possibility of being replaced.	Chen and Ebrahim (2018)
An Empirical Investigation on CEO Turnover in IT Firms and Firm Performance	CEO turnover is a significant determinant of the company's performance, particularly in the IT sector.	Zhang, Wierschem, Mediavilla, and Hong (2016)
Board Structure and Monitoring: New Evidence from CEO Turnovers	More board independency and total independence of nominating committees lead to more rigorous monitoring and discipline regarding CEO performance.	Lixiong and Masulis (2015)
Executive pay matters: looking beyond the CEO to explore implications of pay disparity on non-CEO executive turnover and firm performance	The position as executive greatly influences the probability of turnover and the company's performance.	Pissaris, Heavey, and Golden (2017)
Financial performance and non-family CEO turnover in private family firms under different conditions of ownership and governance	When a family business is concentrated with few family members, or when there are few members of the family participating on the board, the CEOs who are family members are less likely to be replaced after showing low performance.	Visitin, Pittino, and Minichilli (2017)
Managerial Labor Market during Institutional Transition: A study of CEO compensation and voluntary turnover	CEOs who have compensation that is lower than the expected, are associated with voluntary turnover in China.	He, Shaw, and Fang (2017)
CEO turnover in large banks: Does tail risk matter?	Systematic risk is only essential for CEO turnover if there is a significant variation in the costs that this risk represents to shareholders and the organization,	Srivastav, Keasey, Mollah, and Vallascas (2017)

The Effect of Ex-ante CEO Turnover Risk on Firms' Discretionary Expenditures	The risk of CEO turnover leads to weak decisions. These decisions will hinder the company's value. Companies sometimes maintain low-performance managers and face the consequences of weak decisions that jeopardize the company's performance in the long term.	Changu, Hyung, Byungjin, and Seungwon (2018)
The impact of family owners' monitoring on CEO turnover decisions and the role of trust	Owners of family companies can immediately replace a low-performance CEO only when the CEO is an external professional, not a family member.	Rizzotti and Mazzone (2017)

Table 1: International studies on CEO turnover

According to the theoretical framework presented, the research examines the organizations listed in the Brazilian stock exchange B3 during the period from 2010 to 2016, observing their level of tax aggressiveness and their CEO turnover. Based on the international literature analyzed, the hypotheses tested in this study are:

H1: CEO turnover increases when the company is very tax aggressive.

H2: CEO turnover increases when the company is not enough tax aggressive.

3 METHODOLOGY

This study seeks to identify the influence of corporate tax aggressiveness on CEO turnover using multivariate statistical analysis techniques. The proxies chosen as metrics for tax aggressiveness are: *CASH_ETR*, based on Dyreng et al. (2010), which is the amount the company disbursed to pay taxes, excluding deferred income tax; *ETR_LONGRUN*, which is the total tax paid in the last three years; and the product of the tax at the value-added statement (VAS) on the value-added (TVAT), which is a proxy that better captures the Brazilian reality regarding the level of the organizations' tax aggressiveness.

The study examines data on tax aggressiveness from companies listed on the Brazilian stock exchange B3, except financial firms, from 2010 to 2016. Data about CEO turnover was obtained from the companies' reference report (document required by B3) and collected at the CVM online platform. Influenced by the work by Chyz & Gaertner (2018), this study expects to find a direct relationship between tax aggressiveness and CEO turnover also in Brazil.

The research uses data from the VAS, which is a better metric for tax aggressiveness considering the Brazilian context (Martinez, 2017) since it analyzes the federal, state, and local taxes levied on sales, rather than only on income taxes. The publication of the VAS has been mandatory since 2010, and this study analyzes the documents released from 2010 to 2016. The information about CEO turnover was examined until 2017.

Data on CEO turnover was collected in the reference report of each company, published in CVM's online platform. Data of the VAS was obtained from the standard financial statement for each company/year, also disclosed on the CVM's online platform. Other corporate financial data was collected from the *Economática* database. The study uses panel data with a sample size company/year that oscillates according to the availability of the metrics on tax aggressiveness.

3.1 Metrics for tax aggressiveness

The proxies used to measure tax aggressiveness are presented in Table 2:

Variable	Description	Reference
<i>CASH_ETR</i>	$\frac{\text{Payable tax}_{t-1} + \text{Total expenses on income tax} - \text{Payable tax}_t}{\text{Profit before income tax (PBIT)}}$	Chyz and Gaertner (2018)
<i>ETR_LONGRUN</i>	$\frac{\text{Total expenses IRPJ and CSLL}_t + \text{Total expenses IRPJ and CSLL}_{t-1} + \text{Total expenses IRPJ and CSLL}_{t-2}}{\text{PBIT}_t + \text{PBIT}_{t-1} + \text{PBIT}_{t-2}}$	Hanlon and Heitzman (2010)

TVAT	$\frac{\text{Total tax in the VAS}}{\text{Total value-added}}$	Martinez and Motta (2017)
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Table 2: Metrics on tax aggressiveness

The first proxy used for tax aggressiveness was the CASH_ETR, which is the measure that calculates the amount of taxes paid by firms in relation to accounting profit. CASH_ETR expresses the amount the company disbursed and is established for each company/year. (Armstrong et al. 2015). CASH_ETR is used instead of ETR because it is closer to what the company disbursed to pay taxes in a given year.

The second proxy was the ETR_LONGRUN, which measures the total taxes the company paid in the last three years, thus excluding deferred tax. It provides a more dynamic measure of tax aggressiveness, including a more extended period, not just a single year such as the CASH_ETR.

The third metric of tax aggressiveness was the TVAT, which encompasses taxes on sales, a type of taxes characteristic of the Brazilian context and that represents the majority of the company’s tax burden (Martinez & Motta, 2015).

The use of this set of metrics sought to capture the variation in the company’s tax planning and tax avoidance compared to other companies of the same size, sector, and year.

3.2 Regression model

The following regression inspired by the study by Chyz and Gaertner (2018) was applied:

$$CEO\ Turnover_{i,t+1} = \beta_0 + \beta_1 high\ tax\ aggressiveness_{i,t} + \beta_2 low\ tax\ aggressiveness_{i,t} + \beta \sum_3^6 Controls_{i,t} + I_j + T_t + \varepsilon_{i,t} \quad (1)$$

Where:

Variable	Description
<i>CEO Turnover</i>	It is the dependent variable that identifies whether there was CEO turnover in the company. It is 1 for company/year where the CEO was replaced and 0 when there was no CEO turnover.
<i>High tax aggressiveness</i>	It is an explanatory variable, equals 1 for observations in the lower quintile of tax aggressiveness and 0 for other observations.
<i>Low tax aggressiveness</i>	It is an explanatory variable, equals 1 for observations in the highest annual quintile of tax aggressiveness, and 0 for other observations.
<i>Controls</i>	Control variables.
<i>E</i>	Error variable.

Table 3: Regression model

In the regression model, β_1 is the coefficient of high tax aggressiveness, β_2 is the coefficient of low tax aggressiveness Equation 1 reports the marginal effects of a logit panel regression model where the dependent variable is CEO turnover. Linear probability models generate estimates of a binary dependent variable. This design choice helps the economic interpretation of the coefficient of interest of this study¹. The definitions of the equation variables are as follows: CEO Turnover is the variable that indicates whether there was a CEO replacement in the company (it equals 1 for company/years where there was the event, and 0 when there is no CEO turnover²; high tax aggressiveness is an explanatory variable that equals 1 for observations in the lowest quintile of CASH_ETR/ETR_LONGRUN/TVAT, and 0 for

¹ Using a regression model that does not affect data inference.

² For any event where there was no CEO turnover in the panel company/year, the variable CEO Turnover was attributed 0. For example, if the company ‘A’ replaced the CEO in 2011, it was attributed 1 for CEO Turnover for that year. If the same company did not replace its CEO in 2012, the variable was considered 0.

other observations; low tax aggressiveness is an explanatory variable that equals 1 for observations in the highest annual quintile of CASH_ETR/ETR_LONGRUN/TVAT, and 0 for other observations; I is a fixed effect vector of industry sector; T is a fixed effect vector of the year, β_0 is an intercept, β_1 is the coefficient of high tax aggressiveness, β_2 is the coefficient of low tax aggressiveness, and ε is the error variable. The model and current results are estimated separately for CASH_ETR (Chyz & Gaertner, 2018), TVAT (Martinez & Silva, 2018; Martinez & Motta, 2017), and ETR_LONGRUN (Hanlon & Heitzman, 2010).

Hypothesis 1 states that CEO turnover is more likely to happen in companies with a relatively low effective tax rate. In regression (1), the hypothesis should be supported by a positive and significant β_1 coefficient.

Hypothesis 2 states that CEO turnover is more likely to happen in companies with a relatively high effective tax rate. In regression (1), the hypothesis should be supported by a positive and significant β_2 coefficient.

3.3 Control variables

A set of control variables was added, using variables already adopted in previous accounting research, and that tends to influence CEO turnover (Menon & Williams, 2008).

Variable	Description	Reference
<i>SIZE</i>	Size of the company, established by the natural log of the company's total asset in the previous year.	Hamori and Koyuncu (2015).
<i>DeltaROA</i>	Return on current assets before taxes, minus return on assets before taxes in the previous year.	Zajac (1990)
<i>LEV</i>	Long term debt related to total assets.	Jianxin and Yuching (2011)
<i>State control</i>	Binary variable indicating if the firm is a state-owned enterprise.	Nossa (2017).

Table 4: Control variables

Previous studies report that company size (*SIZE*) tends to influence CEO turnover (Hamori & Koyuncu, 2015). Return on assets (*DeltaROA*) variation is well known and widely used as a measure of performance in CEO turnover research (Zajac, 1990). Financial Leverage (*LEV*) is another variable that tends to influence CEO turnover (Jianxin & Yuching, 2011). State control may influence the likelihood of CEO turnover regarding political issues, not related to performance.

4 RESULTS ANALYSIS

4.1 Descriptive statistics

Table 5 presents the descriptive statistics of the observations, covering the periods from 2010 to 2016. The independent variables of high and low tax aggressiveness are listed, together with the control variables: Return on asset variation (*DeltaROA*), leverage (*LEV*), company size (*SIZE*), and state control.

Table 5 also shows the observations (the number of information contained in the database, considering the company/year of each variable). The mean and standard deviation, the minimum and maximum values, and the 1st and 3rd quartile of the sample are also indicated in the table.

Variable	Observ. Comp/year	Mean	Standard deviation	Min.	1 st Quartil	3 rd Quartil	Max.
HTAcash_etr	5384	0.08	0.27	0.00	0.00	0.00	1.00
LTAcash_etr	5384	0.76	0.43	0.00	1.00	1.00	1.00

HTAetr_longrun	5384	0.18	0.38	0.00	0.00	0.00	1.00
LTAetr_longrun	5384	0.52	0.50	0.00	0.00	1.00	1.00
HTAtvat	5384	0.08	0.28	0.00	0.00	0.00	1.00
LTArvat	5384	0.66	0.47	0.00	0.00	1.00	1.00
SIZEw	3279	13.43	3.05	2.20	12.41	15.30	18.23
DeltaROAw	3226	-2.32	102.65	-614.78	-3.54	2.07	601.27
LEVw	2996	202.25	1512.59	0.00	0.04	2.01	13678.91
StateControl	3703	0.05	0.21	0.00	0.00	0.00	1.00
CEOTurnover	3703	0.57	0.49	0.00	0.00	1.00	1.00

Table 5 – Descriptive statistic after Winsor

Note: HTAcash_etr, HTAetr_longrun, HTAtvat are binary variables of high tax aggressiveness, of different metrics of tax aggressiveness. LTAcash_etr, LTAetr_longrun, LTArvat are binary variables of low tax aggressiveness of different metrics of tax aggressiveness. SIZE: company size, established by the natural log of the asset in the previous year. DeltaROA: variation of the return on assets. LEV: Leverage. StateControl: binary variable of state control. CEOTurnover: binary dependent variable of CEO turnover. To minimize the effects of the outliers in variables SIZE, DeltaROA, and LEV, the Winsor estimator was used (1% in each distribution tail)

The variables HTAcash_etr, HTAetr_longrun, HTAtvat are binary independent variables, where 1 represents the high tax aggressiveness, and 0 the opposite. This result is found by applying a quintile in the CASH_ETR, ETR_LONGRUN, and TVAT variables where companies in the lowest quintile (0% to 20%) are classified as highly tax aggressive. The variables, LTAcash_etr, LTAetr_longrun, LTArvat are binary independent variables, where 1 represents low tax aggressiveness, and 0 the opposite. This result is found by applying a quintile to the CASH_ETR, ETR_LONGRUN, and TVAT variables, where companies in the highest quintile (80% to 100%) are classified as less tax aggressive.

The STATA winsor command was used on the DeltaROA, LEV, and SIZE variables for adjustments of possible outliers. The values 1% in the limit of the left tail and 1% in the right limit were changed by values close to the extremes. No exceptional observations were rejected and the values were changed to a similar and reliable observation. Indispensably, the size of the winsorized variables must be the same as the originals collected; thus the averages are more stable (Turkey, 1962). The variable size (SIZE) resulted in a mean of 13.43, with values ranging from a minimum of 2.2 to a maximum of 18.23. For the variable return on assets variation (DeltaROA), an average value of -2.32 was obtained, with values ranging from a minimum of -614.78 to a maximum of 601.27. Regarding the leverage variable (LEV), an average value of 202.25 was found, with values ranging from a minimum of 0 to a maximum of 13,678.91.

The StateControl variable is a binary variable related to the control of the state over the company, where 1 is attributed to companies that are state-owned enterprises and 0 for the opposite. The variable CEOTurnover is the regression dependent variable, where 1 is attributed to companies that had CEO turnover and 0 the opposite.

4.2 Correlation matrix

The correlation matrix in table 6 showed the correlation between the variables of the proposed model, observing the tax aggressiveness metric CASH_ETR.

	CEOTurnover	HTAcash_etr	LTAcash_etr	StateControl	SIZE	DeltaROA	LEV
CEOTurnover	1.0000						

HTAcash_etr	0.0660***	1.0000					
LTAcash_etr	-0.1372***	-0.4066***	1.0000				
Statecontrol	-0.0106	-0.0294*	0.0186	1.0000			
SIZE	-0.0103	-0.0369**	-0.2110***	0.1445***	1.0000		
DeltaROA	0.0050	0.0138	0.0081	-0.0180	-0.0692***	1.0000	
LEV	-0.0074	0.0281	0.0772***	-0.0247	-0.3273***	-0.0374*	1.0000

Table 6 – Correlation matrix using CASH_ETR as metrics to tax aggressiveness

Note: ***, ** and * significant at the levels 1%, 5%, and 10% respectively.

Table 6 highlights the relationship of the high tax aggressiveness (HTAcash_etr) and low tax aggressiveness (LTAcash_etr) variables, with the dependent variable CEOTurnover as a 99% significance index.

The correlation matrix in Table 7 shows the correlation between the variables of the proposed model, using the tax aggressiveness metric ETR_LONGRUN.

	CEOTurnover	StateControl	HTAetr_lonrun	LTAetr_longrun	SIZE	DeltaROA	LEV
CEOTurnover	1.0000						
Statecontrol	-0.0106	1.0000					
HTAetr_lonrun	0.0129	-0.0256	1.0000				
LTAetr_longrun	0.0379**	-0.0186	0.4470***	1.0000			
SIZEw	-0.0103	0.1445***	-0.1578***	-0.0625***	1.0000		
DeltaROAw	-0.0276	0.0084	-0.0124	-0.0004	0.0330	1.0000	
LEVw	0.0316*	-0.0310*	-0.0213	0.0570***	0.3797***	0.0019	1.0000

Table 7 – Correlation matrix using ETR_LONGRUN as metrics of tax aggressiveness

Note: ***, ** and * significant at the levels 1%, 5%, and 10% respectively.

Table 7 highlights the relationship of the low tax aggressiveness variable (LTAetr_longrun) with the dependent variable, CEOTurnover as a 95% significance index.

A correlation matrix was developed for the tax aggressiveness metric TVAT. There was no correlation between the dependent variable CEOTurnover and the independent variables of the model: high tax aggressiveness and low tax aggressiveness, as shown in Table 8.

	CEOTurnover	HTAtvat	LTArvat	StateControl	SIZE	DeltaROA	LEV
CEOTurnover	1.0000						
HTAtvat	0.0295	1.0000					
LTArvat	-0.0187	-0.3825***	1.0000				
StateControl	-0.0106	-0.0217	0.0495***	1.0000			
SIZE	-0.0103	-0.0647***	-0.1590***	0.1445*	1.0000		
DeltaROA	0.0050	-0.0149	0.0158	-0.018	-0.0692*	1.0000	
LEV	-0.0074	0.0627***	0.0862***	-0.0247	-0.3273*	-0.0374*	1.0000

Table 8 – Correlation matrix using TVAT as metric of tax aggressiveness

Note: ***, ** and * significant at the levels 1%, 5% and 10% respectively

The correlation matrix with significant variables between CEO turnover and indicators of high and low aggressiveness shows the potential for a significant relationship between the variables. However, the robust results are those presented by multivariate regressions.

4.3 Results of regression

For the regression model, the data were studied using the three metrics on tax aggressiveness: CASH_ETR, ETR_LONGRUN, and TVAT. Three statistical methods were used to estimate the data: ordinary least squares, panel regression, and logit regression, for each of the tax aggressiveness metrics. The most accurate method was panel logit regression, with fixed effect of the company and year.

According to the panel logit regression model with fixed effect ‘company and year,’ using the CASH_ETR tax aggressiveness metric, the model was estimated based on 6 interactions and counting 2,250 observations.

CEOTurnover	Coeff.	Std. Err.	Z	P> z	[95% Conf. Interval]	
StateControl	-0.167118	0.1971136	-0.85	0.397	-0.5534536	0.2192176
HTAFcash_etr	-0.0232353	0.1402686	-0.17	0.868	-0.2981566	0.251686
LTAcash_etr	0.1789121	0.1011695	1.77	0.077*	-0.0193765	0.3772006
SIZEw	-0.0244108	0.0168523	-1.45	0.147	-0.0574408	0.0086191
DeltaROAw	0.0037287	0.0303469	0.12	0.902	-0.0557501	0.0632075
LEVw	0.0016042	0.0232155	0.07	0.945	-0.0438973	0.0471057

Table 9 – Results of regression with CASH_ETR

Note: * relation at 90% confidence interval

Table 9 presents the result of the regression using CASH_ETR as a tax aggressiveness metric, pointing out only one variable that was related to CEO turnover, LTA (low tax aggressiveness), with 90% confidence represented by its p-value (P>|z|) less than 10% (0.077). The estimated ratio is approximately 18% (0.1789121), meaning that with each 1% increase in the degree of low tax aggressiveness, the CEO will have an additional 18% chance of being replaced. However, one cannot discard the variable SIZE, which presented a relevant result for its p-value (P>|z|) of 0.147.

For the logit panel regression model, with fixed effect of company and year and adopting the tax aggressiveness metric ETR_LONGRUN, six interactions were used to estimate the model, counting 2,544 observations.

CEOTurnover	Coeff.	Std. Err.	Z	P>z	[95% Conf. Interval]	
StateControl	-0.0493924	0.1871823	-0.26	0.792	-0.416263	0.3174783
HTAetr_long	-0.1403001	0.102867	-1.36	0.173	-0.3419157	0.0613155
LTAetr_long	0.1898604	0.1059129	1.79	0.073*	-0.0177251	0.3974459
SIZE	-0.0068916	0.0156358	-0.44	0.659	-0.0375373	0.023754
DeltaROA	-0.0005962	0.000397	-1.50	0.133	-0.0013744	0.000182
LEV	0.000042	0.0000334	1.26	0.208	-0.0000234	0.0001075

Table 10 – Results of regression with ETR_LONGRUN

Note: * relation at 90% confidence interval

Table 10 presents only one variable related to CEO turnover, LTA (low tax aggressiveness), with 90% confidence represented by its p-value ($P>|z|$) below 10% (0.073). The estimated ratio is approximately 19%, i.e., for each 1% increase in the degree of low tax aggressiveness, there are 19% chances of CEO replacement. However, one cannot discard the DeltaROA variable, which presented a relevant result for its p-value ($P>|z|$) of 0.133. According to the panel logit regression model, with fixed effect of company and year, using the TVAT tax aggressiveness metric, six interactions were used to estimate the model, counting on 2,544 observations.

Table 11 shows the results of the regression using the TVAT tax aggressiveness metric, not related to any model variable with 99, 95, and 90% confidence, represented by its p-value ($P>|z|$) lower than 10, 5, and 1%. However, one cannot discard the variable DeltaROA that presented a relevant result for its p-value ($P>|z|$) of 0.134, and the LEV that also presented a relevant result for its p-value ($P>|z|$) of 0.166.

CEOTurnover	Coeff.	Std.Err.	Z	$P> z $	[95% Conf. Interval]	
StateControl	-0.0736107	0.187	-0.390	0.695	-0.441046	0.2938246
HTAtvat	-0.0685431	0.1300795	-0.530	0.598	-0.3234942	0.186408
LTArvat	0.0365225	0.0935233	0.390	0.696	-0.1467798	0.2198248
SIZE	-0.0045730	0.0156745	-0.290	0.770	-0.0352944	0.0261484
DeltaROA	-0.0005994	0.0004004	-1.500	0.134	-0.0013842	0.0001854
LEV	0.0000461	0.0000333	1.380	0.166	-0.0000192	0.0001115

Table 11 – Results of regression with TVAT

In addition, a test for omitted variables was performed to check if there is an explanatory variable missing in the model, ensuring that the model is well specified. One of the premises of the linear regression model is that variables X and Y are linearly related. The Ramsey-RESET (1969) test revealed that in H_0 , there are no omitted variables, and the model is well specified, i.e., X and Y are linearly related. In H_1 the model has omitted variables, which generates bias in the coefficient estimates. The command *estatovtest* in the STATA software was used to carry out this test. As $p\text{-value} > 5\%$ in all OLS models, this problem was not detected, and this test is only valid for OLS.

5. IMPLICATION OF RESULTS

The results corroborate the findings obtained by Chyz and Gaertner (2018), evidencing that CEOs who are not sufficiently tax aggressive are more likely to be replaced. Despite there being legal uncertainties regarding the issue of tax avoidance, CEOs in Brazil prefer to pay fewer taxes even though the practice may incur possible penalties for the company, avoiding being replaced.

This study is the first to analyze in the context of Brazil the relationship between tax aggressiveness and CEO turnover. This study implies that a manager should consider the trade-off between tax costs and his tax risk aversion to improve the possibility of being kept in the firm as a CEO. A common notion exists that managers want to minimize taxes and maximize their pleasure. However, managers find it hard to set a tax plan that could reduce the tax base to reduce his tax risk. Instead, a manager with a high tax risk aversion may not be willing to take tax risks that can generate higher financial performance of individual firms than the manager with a low tax risk aversion.

The government collects taxes for political purposes as a part of the costs to satisfy the public's interests. However, taxes imply direct cash outflows for firms. Therefore, managers as

agents of stockholders are likely to be motivated to establish tax plans for taxation minimization. Nevertheless, this behavior would be in part bidding depending on his risk aversion or tolerance. In other words, managers may place more weight on their tax risk aversion than tax costs when establishing their tax plans.

These results provide stakeholders with theoretical and practical implications on managers' tax planning by examining the relationship between the trade-off effect of tax costs and tax risk tolerance and its impact on CEO Turnover. It is worth considering that in general, managers are responsible for a firm's performance, so they will strain for the best possible outcome to create stakeholder value. The findings resemble Lanis et al (2019) that show that when firms engage in tax avoidance, CEOs, on average, are rewarded by improvements in their reputations as proxied by an increased number of outside board seats.

6. CONCLUSION

This study verified whether more or less tax-aggressive Brazilian companies tend to change the CEO. From the data collected from the ECONOMÁTICA and CVM database, the research conducted a multiple linear regression among the dependent variable CEO Turnover, the explanatory variables high and low tax aggressiveness, and the control variables (StateControl, SIZE, DeltaROA, and LEV), which sought to avoid bias in the results.

Three tax aggressiveness metrics based on the literature were used (CASH_ETR, ETR_LONGRUN, and TVAT). The results of these metrics were classified in a quintile, which made it possible to highlight companies that were less or highly tax aggressive. The result analysis observed that the metric TVAT did not present significant results. However, the proxies of tax aggressiveness CASH_ETR and ETR_LONGRUN showed significant results for low tax aggressiveness.

The research found that CEO turnover is sensitive to the outcome of the CASH_ETR and ETR_LONGRUN metrics. When analyzing all taxes using the TVAT metric (which considers indirect taxes), no correlation was found between the variables tax aggressiveness and CEO Turnover. Overall, the results show evidence that CEOs with a profile related to low tax aggressiveness are more likely to be replaced. For managers, the findings reinforce the relevance of tax planning as a determining factor to remain in the position.

This study makes the following significant contributions to the literature. First, it improves our understanding about whether the level of tax aggressiveness enhances or reduces CEO turnover by using a novel empirical approach that captures both positive and negative reputational changes associated with tax aggressiveness. We extend prior research that has presented mixed evidence on the impacts of turnover of tax avoidance (Chyz and Gaertner 2018) by reporting significant and consistent empirical evidence showing that low level of tax aggressiveness in Brazil is associated with CEO turnover. Second, this study uses several well-known tax-avoidance proxies to capture a range of tax-avoidance practices and finds that they have specific impacts on CEO turnover. In particular, CEO turnover is positively associated with less aggressive forms of tax avoidance. Third, the paper also contributes to the literature by showing that tax avoidance, like many other forms of corporate (mis)conduct, does have considerable CEO turnover consequences. However, unlike securities misconduct, which harms shareholders' interests, the low level of tax avoidance gives rise to adverse effects in line with the shareholder-centric view that minimizing tax payments increases firm value. Finally, our results provide some valuable insights for policymakers, regulators, and tax authorities who aim to understand the incentives and disincentives that either drive or deter corporate tax avoidance.

Nevertheless, its relevance, this study presents some limitations related to the fact that it works only with companies listed on the Brazilian stock exchange B3, which is a small number of organizations (just over 500). In more developed markets, such as in the US, there

are more than 3,000 listed companies. Therefore, an analysis must be performed by increasing the number of samples.

Finally, this study may inspire further research, observing, for instance, the CEO's profile regarding their education level (degree, master, or Ph.D.), whether they were trained in public or private educational institution, the CEOs background, religious preferences, whether they had military training, or present a narcissistic profile. Future research needs to analyze how managers' risk tolerance is affecting aggressive tax avoidance and find the factors that prevent managers from considering tax and non-tax expenses at the same time. Managers will strive to discover an optimal cost structure that can exist between tax and non-tax costs. This may vary depending on the managers' tax risk tolerance due to the personal style they have, which is considered as a future research direction.

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