



Management and Business Research Quarterly

2020(15)54–65



Tunneling and Tax Aggressiveness

Israel Lucas de Oliveira Aguiar*, Felipe Ramos Ferreira, Silvania Neris Nossa,
Edvan Soares de Oliveira

Fucape Business School, Brazil

Received 3 April 2020

Accepted 18 August 2020

ABSTRACT

In Brazil, there are no mechanisms to identify cases where controlling shareholders might be using tax aggressiveness as a strategy to expropriate value from minority shareholders, the practice known as tunneling. This deserves attention because investors should be able to understand when tax aggressiveness is not designed to generate the purported value. Hence, this study analyzes the relation between tax aggressiveness and tunneling in companies listed on the Brazilian securities exchange (B3), in the period from 2010 to 2017. The data were obtained from the Economática® database and were submitted to analysis by ordinary least squares in two stages. The results show that tax aggressiveness, measured by the differential effective tax rate (DETR), is statistically significant to explain tunneling since the coefficient of aggressiveness is significant and positive at 5%. Therefore, on average firms in the sample considered to be more aggressive (based on DETR) presented greater tunneling. The coefficient of the variable DETR allowed inferring that a 1% increase in tax aggressiveness is associated with an increase of 0.46% in the proportion of accounts receivable from related parties concerning assets. Thus, tax aggressiveness can reduce the probability of generating value for minority shareholders. This result agrees with the finding of Chan, Mo and Tang (2016), who identified direct evidence of the existence of tax aggressiveness related to tunneling.

Keywords: Tunneling, Tax Aggressiveness, Related Parties

Introduction

The accounting practice of tax avoidance is generally seen as increasing the value of firms because by reducing the tax burden, more money is available for reinvestment and/or return to the investors in the form of dividends (Chan et al., 2016). In this sense, tax avoidance serves to measure the level of tax aggressiveness of firms, defined as management practices to reduce the tax basis through tax planning activities (Chen, Chen, Cheng, & Shevlin, 2010).

* Corresponding author. E-mail address: israel_contabil@hotmail.com

Doi:10.32038/mbrq.2020.15.05



However, tax avoidance activities can create diversion of earnings away from minority shareholders to managers or majority shareholders. This is particularly true of emerging countries such as China, India and Brazil, among others (Chan, Mo, & Tang, 2016). That situation derives from an agency conflict.

The activities that improve the performance of managers (agents) do not necessarily increase the financial return of the majority shareholders (controllers). Therefore, the decisions made by the agents can be different from the decisions considered optimal by the majority shareholders, in which case an agency conflict occurs (Jensen & Meckling, 1976).

Chen et al. (2010) reported that the divergence between majority and minority shareholders is also a possible type of agency conflict and is a frequent situation in firms with highly concentrated ownership structures. This is particularly the case of family firms, where this type of concentration exists by definition, and where non-controlling shareholders can worry about tax avoidance activities because it can reduce the share price. Therefore, controlling family shareholders can be willing to relinquish tax benefits at the moment of computing taxes to avoid the non-fiscal cost of a possible reduction of the market value of their shares (Chen et al., 2010; Desai & Dharmapala, 2006; Ramalho & Martinez, 2014).

Evidence exists of possible channels for the expropriation of the wealth of non-controlling shareholders by majority shareholders based on tax avoidance. Among these channels are transactions with related parties (Chan et al., 2016). The probability of engaging in transactions between related parties is greater in firms with high ownership concentration, in which financing is one of the main types of transaction. The resulting financial arrangements can be used as a tool to benefit the majority shareholders and expropriate wealth from those in the minority. This practice is known as tunneling (Songhua, Yanqin & Yuehua, 2009).

In this respect, Chan et al. (2016) studied the relation between tax aggressiveness and tunneling of nonfinancial companies listed on the Shanghai and Shenzhen stock exchanges in China. They identified a positive association between tax aggressiveness and tunneling, and this was most pronounced for firms with cash shortages and in settings of relatively weak investor protection.

In the Brazilian context, to the best of my knowledge, there have been no conclusive studies about this matter. However, the country is noted for having high shareholding concentration, making agency conflicts more likely (Rogers et al., 2007). Therefore, the objective of this paper is to examine the relationship between tax aggressiveness and tunneling derived from transactions between related parties in the context of the Brazilian capital market.

The international and Brazilian literature describes various tools to measure the possible result of conflicts between majority and minority shareholders. These tools are important because they can also be applied to measure the expropriation of minority shareholders in the Brazilian context.

Baia (2010) measured the potential for the expropriation of minority shareholders, correlating it with the levels of corporate governance in the Brazilian equity market. Soares and Kloeckner (2008) found a correlation between shareholding concentration and indebtedness and the influence of these factors on the expropriation of minority shareholders in firms traded on the Bovespa (now the B3). However, these Brazilian studies did not correlate tax aggressiveness with this expropriation of minority shareholders, leaving a gap in

the literature related to these two themes.

Therefore, this study is justified because it can help investors understand how tax aggressiveness may or may not generate value to the minority shareholders. Besides this, few studies have examined the association of tax aggressiveness and tunneling in Brazil, so there is a need for deeper analysis of the theme, principally of tunneling derived from transactions between related parties.

This study is empirical, descriptive and quantitative, to investigate the relationship between tax aggressiveness and tunneling derived from transactions between related parties of Brazilian companies. The sample is drawn from firms listed on the “Brasil Bolsa Balcão” (B3) exchange in the period from 2010 to 2017. The starting time is the result of the availability of data in the reference forms, which contain a series of control variables only dating back to 2010.

Theoretical framework

Tax aggressiveness

Taxes represent a significant cost to firms and reduce the available cash flow. Hence, companies and their shareholders naturally try to reduce the tax burden as much as possible, through practices that have varying degrees of aggressiveness (Chen et al., 2010). According to Karthik Balakrishnan, Blouin and Guay (2019), tax aggressiveness exists when companies pay taxes at a level below the average in relation to their activity and/or sector.

However, despite widespread interest among international researchers in this topic, as yet there is no consensus on the definition of tax aggressiveness (Hanlon & Heitzman, 2010; Blouin, 2014).

Furthermore, firms’ posture toward the tax authorities varies between correct and incorrect, with a huge gray area between the extremes. When strong facts and legal arguments support a firm’s tax policies, they are considered correct. On the other hand, when the tax practices are supported by weak facts and nebulous interpretation of legislation, they are deemed incorrect. The level of tax aggressiveness can be determined by the position of the firm between these two extremes (Schmidt et al., 2013).

Schmidt et al. (2013) explained that tax aggressiveness by means of avoidance needs to be distinguished from evasion. According to Slemrod (2004), tax avoidance includes actions that firms can undertake to reduce their tax obligations, but not all tax avoidance is considered to be aggressive.

On the other hand, tax evasion involves the reduction of tax obligations by any means outside the law, while tax aggressiveness is more aligned with tax planning within the law. Thus, a firm with an aggressive stance toward taxation will engage in better tax planning, and a cutoff point exists between tax evasion and tax aggressiveness. This separation is explicitly based on the judgment of those that analyze the possibilities, consequences and ambiguities of tax law (Lietz, 2013).

When choosing a level of tax aggressiveness, managers analyze the costs and benefits. The greatest benefit of tax aggressiveness is the preservation of more cash flow. While the resulting savings remunerate the shareholders, they also benefit, directly or indirectly, the managers for their efforts to attain effective tax management.

One way to measure this tax aggressiveness was applied by Chan et al. (2016). They calculated it as the difference between the average tax burden on profits according to the

sector of activity and year on the one hand, and what that firm paid on the other. They used this difference in the effective tax rate (DETR) as their measure of tax aggressiveness.

In this scenario, tax avoidance can be used as an instrument to help managers or other insiders to extract wealth from the firm itself (Chan et al., 2016), as a type of agency conflict between controlling and non-controlling shareholders. Jensen and Meckling (1976) discussed the agency conflict existing between ownership and management when exercised by different people (managers and shareholders) in large companies with dispersed ownership and a large number of interested parties. According to them, an agency relationship is a contract whereby one or more individuals (principals) contract an agent to engage in activities or render services on their behalf, delegating to the agent the authority to make decisions. Besides this, if both sides want to generate returns, there can be good reasons for this agent not to act in the interest of the principals.

In firms with dispersed ownership, it is necessary to align the interests of the shareholders with those of the managers. On the other hand, in firms with concentrated ownership, the more relevant agency problem that needs to be addressed is the conflict of interest between the majority and minority shareholders (Songhua, Yanqin, & Xu, 2009).

The role of tax aggressiveness in agency conflicts was first described by Desai and Dharmapala (2006). They pointed out that tax avoidance in and of itself does not give rise to extraction or wealth and vice versa. However, it can supply the managers and/or controlling shareholders with a reason to engage in transactions with related parties. In this case, tax avoidance, which is designed to impede detection of the real situation by the tax authorities, permits insiders to conceal their real information (Desai & Dharmapala, 2006).

Expropriation of minority shareholders –tunneling

The expropriation of minority shareholders (tunneling) occurs due to the natural fact that large investors pursue their interests, which do not necessarily coincide with the interests of other investors with smaller holdings, or with the interests of the employees and managers (Baía, 2010).

The word “tunneling” in this context derives from the analogy between the nefarious activity of digging a tunnel to break into a bank vault, escape from a prison or undermine a fortress wall, and the activity of transferring assets and profits from companies to benefit their controllers in detriment to the minority shareholders (Johnson, 2000).

Cheung et al. (2009), in their study of listed Chinese companies, stated that minority shareholders are exposed to the risk of expropriation through tunneling, as well as to the gain resulting from these transactions. The authors found statistical support for the existence of more tunneling activities than the gain itself, demonstrating that the practice is not attractive to shareholders with smaller equity stakes.

For example, the expropriation of minority shareholders by the controllers, or tunneling, can occur in the administration of projects in which the chief executives of the company are linked to a large shareholder, to serve their interests over those of the company. Likewise, in loans between firms belonging to the same business group, interest rates can be used that are considered below those established by the market (Baía, 2010).

Another example of expropriation of minority shareholders was reported by Cheung et al. (2009), of a Chinese company controlled by a municipal government and listed on the Shenzhen Stock Exchange, which transferred the equivalent of US\$ 4 million for the

safekeeping and administration of the controlling shareholder, in violation of the exchange's rules. The Chinese market reacted negatively to this transfer, causing the company's stock price to fall by 3.4%. In this respect, one of the main ways found by controllers to expropriate minority shareholders is through transactions between related parties. About transactions between related parties, in the international arena, IAS 24 - Related Party Disclosures provides accounting rules for transactions between related parties. In Brazil, the subject is regulated by Technical Pronouncement 5 from the Accounting Pronouncements Committee (CPC). According to its first revision (CPC 5, R1), related parties can be individuals or legal entities that are in some way related with the company or involved in preparing its accounting statements, with significant influence, control or shared control over that firm's policies (CPC, 2010).

It should be noted that transactions with related parties can have the legitimate benefit of reducing transaction costs. Thus, using a responsible policy of optimizing internal resources, with respect for transfer pricing rules and within the confines of non-evasive tax planning, these transactions can improve competitiveness in the function of scale economies, among other benefits (Miguel, Matos, & Galdi, 2014)

The objective of an accounting pronouncement on the theme is to assure that the financial statements disclose all the information necessary for users to verify the existence and effects of transactions with related parties, including the possibility that these statements are impaired by the existence of transactions and negative/positive balances of accounts with related parties (CPC, 2010).

Matos and Galdi (2014) investigated the impact of transactions between related parties on the operational performance of Brazilian companies. They found that the firms engage in purchase transactions with controllers to increase their operational returns. Knupp (2013), in examining the 100 largest listed Brazilian companies, observed that the greater the number of controlled and affiliated companies was, the higher were the amounts involved in transactions with related parties. Therefore, financial statements can be affected by the existence of transactions between related parties.

Tax aggressiveness and tunneling

Since the objective of this study is to analyze the relationship between tax aggressiveness and tunneling derived from transactions between related parties, I consulted works that have investigated the cash transfers from listed firms to their controller (largest shareholder) and its affiliates.

Knupp (2013) investigated the 100 largest listed Brazilian firms in 2011. He found that of the transactions with related parties, the category that accounted for the largest percentage was loan transactions, with 34.21% of the total.

Berkman, Cole and Fu (2009) evaluated the movement of loans and financing between listed Chinese companies and their controllers. They identified the existence of a direct relationship between the transactions between related parties, financing arrangements and expropriation of minority shareholders. The results demonstrated that the value of the firm is negatively related to financial performance, significantly lowering the distribution of dividends and increasing leverage.

From a theoretical perspective, if managers extract rents using tax avoidance, the future performance of firms should be weaker, and the payments to common shareholders lower.

However, in the United States, there is no evidence of an interaction between tax aggressiveness and rent-seeking. However, it should be stressed that despite the absence of evidence in the USA, a link can exist between tax aggressiveness and rent extraction of companies in emerging economies, like China, Russia, Brazil, India and South Africa, where controlling shareholders can expropriate minority shareholders (Blaylock, 2011).

The studies in China of Chan et al. (2015), Zeng and Vinten (2008), and Cheung et al. (2009) revealed that transactions with related parties were carried out to transfer expenses or revenues to other entities and that a large part of the transfers involved intercompany loans.

Finally, Chan et al. (2016) explained that the intention to divert revenue and conceal activities from minority shareholders that do not have representation in management is what prompts tunneling. Specifically, the savings generated by tax avoidance permits companies to retain greater cash flows and profits under their control, which subsequently increase their capacity to expropriate that cash. The possession of larger cash hoards allows the controlling shareholders to make improper use of the money, such as by granting interest-free loans to the parent company or paying higher expenses to it in return for services.

Based on the above discussion, I test the following hypothesis.

H: There is a positive association between tax aggressiveness and tunneling.

Methodology

Type of study, sample selection and data source

This study is empirical, descriptive and quantitative, to verify the relationship of tax aggressiveness and tunneling derived from transactions between related parties of Brazilian companies with stocks listed for trading on the B3 exchange (Brasil Bolsa Balcão).

The research population is composed of all the firms listed on the B3 between 2010 and 2017. The choice of the starting date is due to the limitation of data contained in the reference forms disclosed by the firms to the market, which contain control variables related to corporate governance, such as data regarding board make-up and proportion of independent directors. Financial and insurance companies were excluded from the sample (since they are subject to different accounting rules) as well as firms that presented inconsistent data, such as negative net equity or negative age.

The data were obtained from the Economática® database, which contains the financial statements of all the companies in the population, along with the reference forms (*formulários de referência* - FR) of the firms, available at the websites of the B3 and the Brazilian Securities Commission (CVM). The data were organized in an Excel® spreadsheet with the help of the staff of the Laboratory for Finance and Risk of the School of Economics, Administration and Accounting of the University of São Paulo (FEA/USP).

The data were then winsorized at 1% on both sides of the distribution (1st and 99th percentile), via the winsor 2 method, to replace outliers.

Since there is different tax policies and applicable tax rates (ATR) for each type of company, varying according to size, type of sector and region, I adjusted the overall sample into subsamples by year and sector.

Chan et al. (2016) measured tax aggressiveness so that this variable would not be affected by a low ATR, and thus constructed a measure of tax aggressiveness called differential effective tax rate (DETR), which is the difference between what the company should pay (average of peers – same sector, size and region) and the amount paid in a particular year.

Since the ETR is normally expected to be lower than the ATR, the DETER should be positive, and a higher DETR should thus reflect a higher level tax aggressiveness.

Table 1: Metrics of tax aggressiveness

Variables	Description	Definition
<i>ETR-Effective Tax Rate</i>	Total expense for tax and social contribution on net profit/earnings before taxation (EBT)	Reflects the effective corporate tax rate on income.
<i>DETR</i>	Difference with respect to the ETR of 34% ¹	Reflects a comparable value, constrained between 0 and 1, hence always positive.

Source: Adapted from Martinez and Ramalho (2017)

To measure tunneling, Li (2010) concluded that in China the “Accounts receivable” rubric represents a large portion of the total assets of firms and that the controlling shareholders to extract money often uses the “Other accounts receivable” rubric from companies. In contrast, in Brazil, the “Accounts receivable from related parties” rubric represents these related-party transactions. Since the loans and receivables involving related parties can be related to normal commercial activities, I adjusted the two measures by the median values of each sector per year, to control for normal transactions with related parties.

The definition of the variables of this study was based on the paper by Chan et al. (2016) and adapted to the Brazilian scenario, as shown in Table 2 below:

Table 2: Variables

Measure	Type	Description of calculation	Data source
<i>Tnn</i>	Explained	Measure of expropriation of minority shareholders, tunneling, determined by the value of “Accounts receivable from related parties” minus the median adjusted by sector and year, divided by total assets.	Economática®
<i>Detr</i>	Explanatory	Measure of tax aggressiveness, computed as $0.34 - \text{total expense for corporate income tax and social contribution on net profit divided by earnings before taxation}$, adjusted by sector and year.	Economática®
<i>Roa</i>	Control	Return on assets: net profit divided by total assets in the previous year	Economática®
<i>Size</i>	Control	Size, denoted by the logarithm of total assets	Economática®
<i>Lev</i>	Control	Financial leverage, consisting of total liabilities divided by total assets	Economática®
<i>Dacc</i>	Control	Discretionary accruals, estimated by the model of Jones (1991)	Economática®
<i>Big 4</i>	Control	Dummy, where 1 applies to companies audited by one of the Big 4 and 0 otherwise.	CVN reports
<i>Outdir</i>	Control	Proportion of independent directors.	Reference form
<i>ceo_dir</i>	Control	Dummy, where 1 applies to forms where the CEO is also a member of the board of directors and 0 otherwise	Reference form
<i>Growth</i>	Control	Growth, denoted by yearly variation of sales revenue divided by total assets	Economática®
<i>Percmax</i>	Control	Percentage or shares detained by the largest shareholder	Economática®
<i>Age</i>	Control	Number of years of listing on the stock exchange	Economática®
<i>Intangible</i>	Instrumental	Total value of intangible assets divided by total assets	Economática®

Source: Authors

To test the hypothesis, greater tax aggressiveness would be associated with a higher

¹ This is the combined rate of corporate income tax and social contribution on net profit. Contributions (*contribuições*) are taxes whose revenues are reserved for specific uses instead of going into the general fund. They may only be established by the federal government. This study does not consider other federal taxes and contributions, or municipal and state taxes.

proportion of financing between related parties; I used regression analysis with an estimation of the model's parameters by ordinary least squares in two stages. This technique was necessary due to the possible problem of endogeneity, which occurs when any explanatory variable of a regression model is correlated with the error component. The main consequence of this is a truncation of the coefficients estimated by the model in question.

The indigeneity problem can arise due to possible simultaneity in the explanation of the variables, since the theme under analysis is subject to doubt regarding which variable best explains what, i.e., it is not very clear whether aggressiveness (DETR) is explained by the expropriation of minority shareholders (TNN) or expropriation (TNN) is explained by aggressiveness (DETR). This is tied to the individual characteristics of the companies studied. In this respect, Kennedy (2009) stated that: "When there is a correlation between a regressor and the error term, the regressor is said to be endogenous; when no such correlation exists, it is said to be exogenous."

The use of intangible assets as an instrumental variable is justified by findings in the literature that firms with high tax aggressiveness tend to have higher proportions of intangibles in their total assets (Guenther, Matsunaga & Williams, 2013)

Model (1): First stage of the two-stage least squares equation

$$\begin{aligned} \text{DETR}_{it} = & \beta^{\circ} + \beta_1 \text{ROA}_{it} + \beta_2 \text{LEV}_{it} + \beta_3 \text{DACC}_{it} + \beta_4 \text{BIG4}_{it} + \beta_5 \text{OUTDIR}_{it} \\ & + \beta_6 \text{CEODIR}_{it} + \beta_7 \text{LEV}_{it} + \beta_8 \text{DACC}_{it} + \beta_9 \text{BIG4}_{it} + \beta_{10} \text{OUTDIR}_{it} \\ & + \beta_{11} \text{INTANGIBLE}_{it} + \varepsilon_{it} \end{aligned}$$

In the first stage, I estimated the expected DETR by regressing DETR on all the independent variables and the instrumental variable "Intangible", as depicted in Model 1. In the second stage, I estimated TNN by substituting DETR with the DETR estimated in the first stage.

I used Model 2 below based on the premise that firms with a higher proportion of loans between related parties should have greater tax aggressiveness.

Model (2): Second stage of the two-stage least squares equation

$$\begin{aligned} \text{TNN}_{it} = & \beta^{\circ} + \beta_1 \text{DETR}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{LEV}_{it} + \beta_4 \text{DACC}_{it} + \beta_5 \text{BIG4}_{it} \\ & + \beta_6 \text{OUTDIR}_{it} + \beta_7 \text{CEODIR}_{it} + \beta_8 \text{LEV}_{it} + \beta_9 \text{DACC}_{it} + \beta_{10} \text{BIG4}_{it} \\ & + \beta_{11} \text{OUTDIR}_{it} + \varepsilon_{it} \end{aligned}$$

In this model, a positive and significant value of the coefficient β_1 would confirm the hypothesis that a positive association exists between tax aggressiveness and tunneling.

Additionally, I report the descriptive measures of the samples segregated according to the practice of transactions with related parties, as well as tests of the mean and variance and Pearson correlation analysis, which also provide indications of the relationship analyzed.

Analysis

Descriptive statistics

On average, the rubric "Accounts receivable from related parties (TNN)" represented 0.43% of the assets of the firms in the sample. This metric also had low volatility, based on the low coefficient of variation. The presence of values of zero in the columns representing the 1st

quartile, median and third quartile indicates that more than 50% of the firms in the sample did not undertake any movement under the rubric “Accounts receivable from related parties” in their financial statements.

Table 3. Characterization of the sample – Descriptive statistics

Variable	Obs.	Mean	Standard					
			Deviation	Minimum	1st Quartile	Median	3rd Quartile	Maximum
Tnn	1107	0.0040	0.0154	-0.0037	0.0000	0.0000	0.0000	0.1103
Detr	1107	0.1498	0.5838	-3.2487	0.0139	0.1215	0.3263	3.0248
Roa	1107	-0.0222	0.3536	-2.7667	-0.0094	0.0271	0.0764	0.3042
Size	1107	14.1921	2.7605	3.4965	12.9823	14.7078	15.9450	18.7456
Lev	1107	0.5174	0.2306	0.0000	0.3919	0.5441	0.6838	0.9598
Dacc	1107	0.0115	0.1344	-0.4892	-0.0503	0.0029	0.0656	0.5094
Big4	1107	0.6396	0.4803	0.0000	0.0000	1.0000	1.0000	1.0000
Out_Dir	1107	0.1969	0.1846	0.0000	0.0667	0.1578	0.2857	0.8333
Ceo_Dir	1107	0.8266	0.3788	0.0000	1.0000	1.0000	1.0000	1.0000
Growth	1107	0.0392	0.1370	-0.3916	-0.0068	0.0194	0.0900	0.5637
Intangible	1107	0.1158	0.1878	0.0000	0.0010	0.0193	0.1554	0.8440
Percmax	1107	0.4309	0.2572	0.0708	0.2351	0.3717	0.5887	1.0000
Age	1107	41.2286	27.4309	4.0000	15.0000	43.00	59.0000	121.0000

Source: authors

Concerning the proxy DETR, the average rate paid by the firms in the sample between 2010 and 2017 was 14.98%, indicating a high degree of tax aggressiveness, because this metric was well below 34% (Table 3)

Correlation analysis Pearson and Econometric Analysis to test hypothesis

The pairwise Pearson correlation values indicate that the variable tunneling was statistically associated at 5% significance with the variables LEV, BIG4, INTANGIBLE and AGE. The associations involving TNN, leverage and age were positive, while the associations with the fact of being audited by one of the Big 4 firms and having a higher level of intangible assets were negative. These results indicate that on average, companies not audited by a Big 4 firm, with more time listed on the exchange and with higher leverage also had a higher level of accounts receivable from related parties in proportion to total assets (presence of tunneling).

The tax aggressiveness, represented by DETR, had a statistically significant and negative correlation at 5% with ROA and Intangible. This result means that companies with a greater return on assets and a higher proportion of intangible assets concerning total assets were on average, more aggressive during the period studied.

Table 4 presents the results of the model estimated by two-stage least squares with Intangible as the instrumental variable. A higher DETR value indicates more tax aggressiveness. Therefore, the positive sign found for the coefficient of that variable, statistically significant at 5%, indicates that companies in the sample with more aggressive tax planning on average had higher levels of tunneling than less aggressive firms. The coefficient allows inferring that an increase of 1% in tax aggressiveness was associated with an increase in tunneling of 0.46%. (Table 4)

Table 4: Estimation of the regression model

Model (2): Two-stage least squares (2SLS)

$$TNNit = \beta^0 + \beta1DETRit + \beta2ROAit + \beta3LEVit + \beta4DACCit + \beta5BIG4it + \beta6OUTDIRit + \beta7CEODIRit + \beta8LEVit + \beta9DACCit + \beta10BIG4it + \beta11OUTDIRit + \epsilon it$$

Dependent Variable: TNN			
	Obs.	Coefficient	Test statistic
Detr	1107	0.0460**	2.280
Roa	1107	0.00688**	2.320
Lev	1107	0.00918*	1.900
Dacc	1107	0.00278	0.350
Big4	1107	0.000930	0.390
Out dir	1107	0.0112*	1.660
Ceo dir	1107	-6.19e-05	-0.0200
Growth	1107	0.00817	1.120
Percmax	1107	-0.00243	-0.610
Idade	1107	6.44e-05	1.580
Control for year and sector			Sim
Estimator			Two-stage least square
Instrument			Intangible
The asterisks *, ** and *** represent statistical significance at 10%, 5% and 1% respectively			

Source: Author

With respect to the control variables, ROA, LEV and OUT_DIR were significant, at 5%, 1% and 1%, respectively. The positive sign of the coefficient of ROA indicates that on average, more profitable companies had greater tunneling in relation to the respective sector. It can also be stated that higher leverage also was associated with greater expropriation on average. Finally, the greater the proportion of independent directors, the higher the expropriation of minority shareholders was.

Final considerations

The focus of this study was to analyze whether Brazilian companies with greater tax aggressiveness also engage in a higher level of expropriation of minority shareholders, considering firms listed on the B3 exchange between 2010 and 2017. For this purpose, two-stage least squares estimation was applied, where the first stage involved estimating the expected DETR, followed by regressing it on all the control variables (ROA, LEV, DACC, BIG4, OUTDIR, CEODIR, GROWTH, PERCMAX, AGE, PERCMAX) and the instrumental variable (INTANGIBLE). The second stage involved re-estimating the model replacing DETR by the DETR estimated in the first stage. The coefficient of the variable DETR, which measures the level of tax aggressiveness, presented a positive sign, statistically significant at 5%, indicating that on average more aggressive firms engaged in greater tunneling than did their less aggressive peers. In other words, it can be said that companies with higher tax aggressiveness on average engaged in greater expropriation of minority shareholders, confirming the research hypothesis. This result agrees with the finding of Chan (2016), who identified direct evidence of the existence of a positive relationship between tax aggressiveness and tunneling, where in China this evidence was stronger for companies that had lower cash flow.

Analysis of the variable OUT_DIR indicated at 1% significance that having a higher

proportion of independent directors had a positive influence on the expropriation of minority shareholders. This result goes against conventional literature. For example, Baia (2010) found that corporate governance variables debated as mechanisms to reduce expropriation of minority shareholders were not significant in relation to the potential for this expropriation. The results of this study can prompt new investigations of the expropriation of minority shareholders by companies. In particular, future studies can apply other measures as proxies for the expropriation of minority shareholders, as well as try to correlate them with other measures of tax aggressiveness.

References

- Baía, E. S. *Expropriação e Governança Corporativa: definição do potencial de expropriation dos controlling shareholders e correlação com os mecanismos de governança corporativa* – São Paulo, 2010 156p
- Berkman, H., Cole, R. A., & Fu, L. J. (2009). Expropriation through loan guarantees to related parties: Evidence from China. *Journal of Banking and Finance*, 33(1), 141–156. <https://doi.org/10.1016/j.jbankfin.2007.11.001>
- Chan, K. H., Mo, P. L. L., & Tang, T. (2016). Tax Avoidance and Tunneling: Empirical Analysis from an Agency Perspective. *Journal of International Accounting Research*, 15(3), 49–66. <https://doi.org/10.2308/jiar-51345>
- Chen, S., Chen, X., Cheng, Q., & Shevlin, T. (2010). Are family firms more or less tax aggressive? *Journal of Financial Economics*, 91(February), 41–61. <https://doi.org/10.1016/j.jfineco.2009.02.003>
- Guenther, D. A., Matsunaga, S. R., & Williams, B. M. (2013). Tax Avoidance, Tax Aggressiveness, Tax Risk and Firm Risk David A. Guenther, Steven R. Matsunaga*, Brian M. Williams Lundquist College of Business, University of Oregon, Eugene, OR 97403 USA August 2013, (August).
- Karthik Balakrishnan, Blouin, J. L., & Guay, W. R. (2019). Tax Aggressiveness and Corporate Transparency, 94(1), 45–69. <https://doi.org/10.2308/accr-52130>
- Knupp, P. D. S. (2013). Determinantes no montante das Transações entre related parties das 100 maiores companhias brasileiras de capital aberto.
- Li, G. (2010). The pervasiveness and severity of tunneling by controlling shareholders in China. *China Economic Review*, 21(2), 310–323. <https://doi.org/10.1016/j.chieco.2010.02.002>
- Lietz, G. (2013). Tax Avoidance vs . Tax Aggressiveness : A Unifying Conceptual Framework. *Institute of Accounting and Taxation*. <https://doi.org/https://ssrn.com/abstract=2363828>
- Miguel, Ó., Matos, P. De, & Galdi, F. C. (2014). O Impacto Das Transações Com related parties Na Performance Operacional Das Companhias Listadas Na Bm&Fbovespa. *Contabilidade Vista & Revista*, 25(2), 84–97.
- Ramalho, G. C., & Martinez, A. L. (2014). Empresas Familiares Brasileiras e a Tax aggressiveness. *International Business Research*, 7, 129–136.
- Schmidt, A., Blouin, J., Boynton, C., Lyon, A., Mescall, D., Mills, L., ... Thornock, J. (2013). Tell Us About Privately Disclosed Tax Shelter Activity ?, 51(3). <https://doi.org/10.1111/joar.12003>
- Soares, R. O., & KloECKner, G. de O. (2008). Endividamento em firmas com alta propensão à expropriation: o caso de firmas com um controlador. *Revista de Administração de Empresas*, 48(4), 79–93. <https://doi.org/10.1590/S0034-75902008000400008>
- Songhua, H., Yanqin, S., & Xu, Y. (2009). Determinants of related-party transactions: Evidence from China's listed companies during 2002-2006. *Frontiers of Business Research in China*, 3(2), 190–206. <https://doi.org/10.1007/s11782-009-0010-6>

Acknowledgments

Not applicable.

Funding

Not applicable.

Conflict of Interests

No, there are no conflicting interests.

Open Access

This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. You may view a copy of Creative Commons Attribution 4.0 International License here: <http://creativecommons.org/licenses/by/4.0/>