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THE IMPACT OF GOVERNANCE MECHANISMS ON TAX AGGRESSIVENESS: EMPIRICAL EVIDENCE FROM TUNISIAN CONTEXT

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Abstract

Research on the tax side occupied the stage center during the last decade. Several researchers have attempted to study the different effects of some options such as tax aggressiveness on firms and individuals. Overall, tax aggressiveness affects negatively the longevity of companies but what remains unanswered is by what specific means corporate governance decreases tax aggressiveness activities. In this paper, we examine the effect of some governance mechanisms on corporate tax aggressiveness. The study is based on the analysis of a sample of Tunisian listed firms over the 2006-2012 periods. Our regression results indicate that diversity in gender on corporate board, managerial and concentration ownership has significant effects on firms` tax aggressiveness activities. Board`s diversity and managerial ownership exhibit a positive association with the effective tax rate while increases in concentration ownership tend to affect it negatively. However, findings don`t show any significant effects of corporate board size and external auditor`s profile on the tax aggressiveness.

1. INTRODUCTION

Since the proliferation of corporate scandals in the last decade, the study of tax aggressiveness has been subject of many intense reflections of researchers and regulators. This is the case of the Canada Revenue Agency (CRA) (2008), proclaimed after investigations that a very important amount of corporate taxes escapes from the State by following aggressive tax planning practices.

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In particular, managers attach a great importance to achieve their objectives following the deployment of tax aggressive activities (Desai & Dharmapala, 2006). Tax aggressiveness is a "plan or arrangement established for the sole or dominant purpose of avoiding tax" (Braithwaite, 2005). It leads also, to significant costs and benefits for management and a reduction in cash flows available to the company and shareholders (Desai & Dharmapala, 2008). Recently, Scholes et al. (2005) report that the tax aggressiveness does not take into account the potential non-tax costs that can accompany this new philosophy and particularly those arising from agency problems.

Management actions designed solely to reduce taxes by setting up tax-aggressive activities are becoming more common in all companies world-wide. Lanis and Richardson (2011) found that taxes are a factor of motivation for many decisions made by managers.

The corporate governance must play an important role in monitoring different actors and harnessing on planning procedures. It must have a global vision of the activities of management, but the question of its performance had been several debates and disputes in time and in space, as a way to rehabilitate the informational efficiency. In this context, several studies (Desai & Dharmapala, 2006; Hanlon & Slemrod, 2009; Lanis & Richardson, 2011; Chen et al., 2010) have shown that some governance mechanisms affects negatively tax aggressiveness.

The tax practices are not unique to developed countries but are also encountered in developing countries and huge amount of money are lost by such practices. In the Anglo-Saxon context, researches have studied the relation between tax aggressiveness and some governance mechanisms and found contradictory results. The Tunisian context has different characteristics from those of Anglo-Saxon ones. Tunisia is one of the countries with high debt capital markets, ownership concentration, preponderance of family firms as well as an incentive tax regulation encouraging investment, while Anglo-Saxon is characterized by fair markets with ownership structure dispersion (Ben Amar & Abaoub (2010).

For that, the Tunisian context seemed an interesting plot for investigation and this study aims to examine the impact of corporate governance mechanisms on corporate tax aggressiveness of Tunisian listed-companies.

2. TAX AGGRESSIVENESS: LIGHTING AND DISTINCTION

Many studies have allowed us to detect the different definitions of tax aggressiveness. According to Chen et al. (2010), tax aggressiveness is defined as the effort of the company to minimize tax payments using aggressive tax planning activities and tax avoidance. It seems to Frank et al. (2009) that the aggressive tax returns is the manipulation to lower tax income due to a kind of tax planning that can be considered as tax management.

This concept may have multiple conceptualizations, references and even different ways to measure, but most of them have the same meaning and the same purpose but differs in their repercussions on the companies' health. Tax aggressiveness can be seen as simple trigger tax management activities that are used for tax planning and have an arrival point for tax evasion.

Bruce et al. (2007) report that the tax aggressiveness seen by their fervent as a set of actions taken by companies to reduce their public debts from shaping and affecting only their scheme financial strategy. Aggressive tax represents different handling activities to lower taxable income that can be legal or illegal. At this stage, we can consider that tax aggressiveness is a strategy deployed by managers, a set of processes, practices, resources and choices whose objective is to maximize income after all company's liabilities owed to the state and other stakeholders.

In particular, it is admitted that tax aggressiveness is not only the reduction of the tax due. However, the implementation of such strategies to reduce the tax base allows the generation high potential non-tax cost that arises from agency conflicts or tax-authority, such as penalties and rent extraction. For that, tax aggressiveness is a very specific and complex range of activities because it is always being surrounded by chaotic economics transactions whose primary organized by managers and have the objective of reducing the corporate tax income and consequently increase the net income. In the same order of idea, Desai and Dharmapala (2006) indicate that tax aggressiveness activities are characterized by complexity and obfuscation, which is practically difficult to detect. In fact the most significant goal is to increase the net income of the company which creates a positive signal to foreign investors. (Chen *et al.*, 2010).

This concept have the same meaning as tax planning, tax avoidance and tax shelters in terms that they meet the legal and ethical provisions established by the tax authorities. The extreme level of tax aggressiveness is tax avoidance, it should not exceed. But obviously tax aggressiveness is characterized by an excessive use of tax avoidance's acts. Tax avoidance is a concept that does not hinder the regulation. English term "tax evasion" embraces the French term "tax fraud", while the concept "tax avoidance" in all cases point the intention to avoid or reduce tax in a legal way. According to CRA tax evasion is the act of deliberately ignoring a specific part of law, unlike tax avoidance, it can affect the criminal plan. However, tax aggressiveness may create tax risks due to the exposure of the business to unexpected results and may also create an incentive for management opportunity and misappropriation of rent-extraction (Khurana & Moser, 2013).

3. THEORETICAL FOUNDATIONS AND LITERATURE REVIEW

The study of tax aggressiveness and corporate governance is based on two main theories: the agency theory and the theory of governance partnership.

The agency theory is the main theoretical framework for the vast majority of research on corporate governance. It defines the problem of interest's divergence that represents a crucial subject to all economic entities due to the separation of ownership and control. The agency conflicts arise from the separation of ownership and management, performed by the firm's CEO, which leads to a loss of value for shareholders. The nature and extent of agency conflicts can affect the level of tax aggressiveness. Researches call for more studies to examine tax aggressiveness in an agency context (Scholes *et al.,* 2005; Desai & Dharmapala, 2006; Lanis & Richardson, 2012).

There are particular potential agency costs recognized as rent extraction by CEOs as an additional income between tax aggressiveness and accounting manipulation (Desai & Dharmapala, 2006). However, in the concentrated ownership structures, an agency problem mainly arises between block-holders and minority shareholders. The block-holders, interested by the protection of their own interests and supported information's asymmetry, aren't concerned by protecting the interests of minority shareholders. In this context, Chen *et al.* (2010), reports that ownership structure, are likely to be significant and may affect the level of tax aggressiveness.

It can be possible that the agency theory does not provide a full and adequate explanation of the association between corporate governance and tax aggressiveness. Specifically, agency theory focuses on the link between managers and shareholders, while corporate social responsibility (CSR) and stakeholder theories focuses on the relationship between firm and many other stakeholders such as tax authorities, political groups, employees, customers and the public in general. Contrary to the agency theory that print out shareholders' governance model drawing a unique relationship established between shareholders and CEOs or between block-holders and minority shareholders, the partnership approach is presented as a broader vision based on a partnership model, which includes all stakeholders of the company.

According to Holme and Watts (2006), CSR is "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and the local community to feel wider".

Recently, Lanis and Richardson (2011) concludes that the principles of corporate social responsibility affect in negative way the tax aggressiveness of Australian companies through his board. The social responsibility of business is reflected by a set of standards that define ethical behavior.

Most studies based on these theories have been conducted in the Anglo-Saxon context. Thus, the transposition of these studies of tax aggressiveness in the Tunisian context must be made in accordance with the specifics of the context. Recent research Richardson *et al.* (2013) suggest that the characteristics of management and the board of directors play a key role in determining the propensity of companies to engage in activities of tax aggressiveness and from another perspective, Chen *et al.* (2010) conclude that family firms are less tax aggressive than non-family firms, renouncing tax activities to avoid the cost of a potential market-price reduction.

4. DEVELOPING HYPOTHESIS

4.1 The corporate board size

The effectiveness of the board depends on its size (Jensen, 1993). In fact, the size of the board can influence the management policy of the company. It refers to the number of directors on the board. Thus, Lanis and Richardson (2011), report that the size of the board has a significant effect on the availability of tax aggressiveness. In contrast, Aliani and Zarai (2012) report the non-significance between the size of the board and tax aggressiveness in the American context. They found that the number of directors does not influence the strategies to minimize tax expenses.

Minnick and Noga (2010) show that the small boards of directors strengthen the good tax management, while large boards are proving ineffectiveness because of the difficulties in decision-making about tax aggressiveness policy. So the first hypothesis of this study is presumed as follows:

H1: All things being equal, the smaller the corporate board' size is, the lower the level of tax aggressiveness will. In other words, the size of the board is positively related to the tax aggressiveness.

4.2 Gender diversity

It has been sad that women play an important role in compliance with legal aspects and more specifically in tax matters. Thus, the Higgs Derek Report (2003) in the United States argues that diversity could improve the effectiveness of the Board and specifically recommends that companies can benefit from the existence of professional women in their boards. Kastlunger *et al.* (2010) show the perfectionist feminine values in the processing of tax topics. However, Adams and Ferreira (2009) suggest that women exert intensive monitoring of managers' actions and have a percentage of attendance at meetings actually high. In the Tunisian context Aliani *et al.* (2011) found that there is a negative effect between gender diversity on the board of directors and tax optimization.

Consistent with the literature on gender differences in risky behavior and tax compliance (Croson & Gneezy, 2009) we assumed that women should have higher levels of tax compliance.

The range of the theoretical arguments mentioned above is in favor of diversity in gender boards. From then, our second hypothesis is as follow:

H2: Gender diversity on the board affects negatively the corporate tax aggressiveness.

4.3 Quality of the external auditor

The external audit quality is a complex and multidimensional concept that is the subject of several studies of corporate governance. It is considered as a real vector to discipline leaders sought transfer of wealth from shareholders. Richardson *et al.* (2013) show that, if the company uses a BIG4 auditor and the services of the external auditor have a low proportion of non-audit services, it is less likely to be aggressive tax purposes. Thus, our third hypothesis is as follows:

H3: The commitment of the company with a BIG4 auditor is negatively associated with tax aggressiveness's level.

4.4 Managerial ownership

Ownership by corporate board members creates an incentive to protect their financial interest in the company. Adhikari *et al.* (2006) pointed out that the impact of ownership structure on the effective tax rate has not been sufficiently explored, particularly in developing countries. As part of this research, we focus on two aspects of the ownership structure: equity concentration and managerial ownership.

In China, Ying (2011) found that the higher the percentage interests of the directors, the lower the effective tax rate is. Similarly, Chan *et al.* (2013) conclude that companies with a high percentage of managerial ownership are less aggressive tax. Also, Minnick and Noga (2010) suggest that the incentives of directors are an important factor of tax aggressiveness in the American context.

Therefore, our fourth hypothesis is as follows:

H4: Tax aggressiveness activities decreases with higher managerial Ownership

4.5 Ownership concentration

Ownership or equity concentration is a way of solving the problem of agency between managers and shareholders; however, it created another type of conflict between minority shareholders and block-holders (Desai & Dharmapala, 2008). Chen *et al.* (2010) found that family firms are less aggressive in tax than their counterparts. They report that family firm's owners are willing to avoid non-tax costs of a potential price reduction that may result from the concern of minority shareholders as well as the fact that their tax aggressiveness provides an opportunity to extract wealth from them. We suppose that a higher concentrated equity can increase the magnitude of aggressive tax strategies. So our last hypothesis is translated as follows:

H5: the level of tax aggressiveness is positively associated with the increase of the ownership concentration.

5. DATA AND METHODOLOGY

Our methodological approach to examine the impact of governance mechanisms on tax aggressiveness is based on a sample of companies listed on the Tunisian stock exchange (TSE) over an investigation period spanning seven years, from 2006 to 2012. Data are collected from the annual reports and the BVMT web-site (http://www.bvmt.com.tn).

Banks wasn't included in our sample for specific legal considerations. Our choice period is justified by the statutory tax rate's change that took place during the year 2006. Finally our sample covers 39 listed companies on the Tunisian stock exchange (TSE) during the period 2006 to 2012.

5.1 MEASURES AND DEFINITIONS OF VARIABLES

5.1.1 Dependent variable
Our dependent variable is represented by the firms tax aggressive (TAG). It is the management to lower taxable income through tax planning activities, so it includes planning activities that are legal or those can beings in the gray zone and illegal activities (Richardson *et al.,* 2013; Taylor & Richardson, 2014). Consequently, tax aggressiveness may vary throughout a series of many cases being in the gray area in dispute (acceptable) on the package (Gilders *et al.,* 2004). Basing on the accounting and tax literature (Dyreng *et al.,* 2008; Robinson & Sikes, 2006; Richardson *et al.,* 2013), we can detect tax aggressiveness by the effective tax rate "ETR". Several authors have considered the measure "ETR" as the most relevant measure of the ability of the company to optimize its tax burden (Zimmerman, 1983; Chadefaux & Rossignol, 2006).

ETR = Total tax expense / Pre-tax income

We rely on the effective tax rate in this study because the "ETR" also represents the alternative measure of tax aggressiveness most frequently used by many academic researchers (Robinson & Sikes, 2006; Dyreng *et al.,* 2008; Minnik and Noga, 2010).

5.1.2 Independent variables
The independent variables in our study refer to some internal and external governance mechanisms. Internal mechanisms are related to the board: board size and gender diversity on board and external mechanisms match the external auditor's profile and the ownership structure.

The board size (BSI) is measured by the logarithm of the total number of directors comprising the corporate board (Godard, 2002). (BSI: The logarithm of the total number of directors comprising the board).

Gender diversity in corporate board (DIV) is measured in terms of percentage of women on the board. (DIV: Number of women in board / the total number of directors comprising the Board of Directors).

Quality of the external auditor (AUD): the quality of the external auditor profile is apprehended by belonging to a BIG4 or not. 'AUD' takes the value 1 if the company hires an auditor BIG4 and 0 if not.

Managerial ownership (MONW): This variable is represented in our study by the percentage of capital held by the leaders and members of the board. It is measured as the cumulative percentage of shares held by the leader and members of the Board of Directors.

Ownership concentration (OCON): Ownership concentration allows a sort of block-holders actions during decision making. The presence of block-holders is measured as the cumulative percentage of shares owned by the principal holders (Mitra *et al.,* 2007). Lapointe (2000), point that the choice of a threshold for block-holders is influenced by local regulations. In our study, the concentration of ownership (OCON) was measured by the cumulative percentage of shares held by major shareholders who own more than 5% of the voting rights.

5.1.3 Control variables
It is essential to include a set of control variables in our analysis, allowing us to control for other specific effects on tax aggressiveness businesses such as firm size, debt level, corporate performance, and growth opportunities. Most recent studies confirm the existence of a positive relationship between firm size and the effective tax rate (Richardson *et al.,* 2013; Desai and Dharmapala, 2006; Chen *et al.,* 2010). The firm size (SIZE) is measured by natural logarithm of total assets. For the debt level (DEB), Taylor and Richardson (2014) found a negative association with tax aggressiveness businesses. We note that the debt can be proved as a

stimulant for the leaders that it reduces their tax burden by deducting interest. This variable is measured by the ratio of long-term debt and total assets. Also, corporate performance (ROA) is central in decision making by managers to the extent that it can be linked to meaningful incentives. Lisowsky (2010) showed that tax aggressiveness is positively associated with performance. This variable is measured by the ratio of operating income to total assets.

Growth opportunities (MKTBK) may also have a relationship with the tax aggressive firms. Based on recent study, Dyreng et al. (2008) found that the growth of companies has a key role of tax aggressiveness within small businesses. This variable is measured by the Market-to-book ratio as a proxy, which is defined as the ratio between the equity market value (market capitalization) of the company and the equity book value. Finally, Tunisian legislation provides a range of tax benefits to certain sectors. Belonging to a privileged area allows companies in this sector to enjoy certain benefits and therefore they are able to engage in tax aggressiveness with the aim to increase their after-tax income. This variable is measured by privileged sector (SECP) as a dummy variable, which takes 1 if the company operates in the activities covered by Article I of investment incentives code and 0 if not.

5.2 Specification of the econometric model
This study aims to examine the relationship between tax aggressiveness of the business and governance mechanisms, thereby leading us an empirical analysis that will help us to identify the different results of this association. The equation for our empirical model is as follows:

$$ETR_{it} = \propto_0 + \propto_1 BSI_{it} + \propto_2 DIV_{it} + \propto_3 AUD_{it} + \propto_4 MOWN_{it} + \propto_5 OCON_{it} + \propto_6 SIZE_{it} + \propto_7 DEB_{it} + \propto_8 ROA_{it} + \propto_9 MKTBK_{it} + \propto_{10} SECP_{it} + \varepsilon_{it}$$

6. DESCRIPTIVE ANALYSIS

6.1 Dependent variable
Descriptive statistics of the dependent variable "ETR" are presented in the table below.

Table 1: Descriptive statistics of the dependent variable "ETR"

Variable	Obs	Mean	Std. Deviation	Min	Max	25%	50%	75%
ETR	250	0.1237	0.162	0.000	0.632	0.024	0.133	0.201

Table 1 shows that tax expense paid varies dramatically from one company to another. We see also that ETR average represent 12.37%. This means that tax aggressiveness is important reducing of tax due and the increase in after-tax income of Tunisian listed firms. In addition, the average ETR is very less compared to the statutory corporate tax rate (30%). Therefore, it should be noted that in average Tunisian companies pay less than half of statutory rate because of the tax benefits accorded to business and regulatory loopholes that allow companies to avoid tax.

By contrast, there are companies that take advantage of tax benefits which effectively displays an ETR= 0, these companies are performing legally and use specialists or tax advisors who offer recommendations on their tax positions and this will increase their tax optimization and consequently increases the after-tax income.

Table 2: Effective tax rate evolution

Year	2006	2007	2008	2009	2010	2011	2012
ETR	0.113	0.112	0.141	0.135	0.127	0.139	0.075

This table shows the annual change in the effective tax rate average in our sample. The income tax actually paid by the companies is relatively stable on average during the period 2006-2011. The annual ETR average is in the interval [11.22%; 14.18%].

6.2 Independent variables

The following table presents a summary of descriptive statistics of our sample for independent variables.

Table 3: Descriptive statistics of the independent variables of the sample

Independent variables	Obs	Mean	Std. Deviation	Min	Max	25%	50%	75%
BSI	250	2.138	.278	1.099	2.565	1.946	2.197	2.303
DIV	250	0.0299	0.0633	0	0.33	0	0	0
MOWN	250	0.1703	0.2467	0	0.844	0	0	0.263
OCON	250	0.675	0.141	0.31	0.998	0.588	0.6918	0.769
Dummy variable	Frequencies				Proportions			
	0		1		0		1	
AUD	178		72		71.20		28.80	

BSI: Natural logarithmic for total number of administrators; DIV: percentage of women in the board; MOWN: percentage of capital held by managers and board members; OCON: cumulative percentage of shares held by the controlling block holders (major shareholders holding more than 5% of capital); AUD: dummy variable equal to 1 if the company hires an external auditor BIG4 and 0 if not

Focusing on the variable "BSI", we find that the number of directors of the board varies from 3 to 12 for the entire sample. We also find that the size of the board for the majority of firms in our sample is 2.30. Also, the percentage of women on the board of directors represented in our analysis by "DIV" is an average of 2.89% for the whole sample and this is almost low. This shows that the Tunisian listed companies are not encouraged by the appointment of more women to their boards. Thus, with regard to the managerial ownership "MOWN", has in average 17.03%. However, the majority of firms in our sample have an average of 26.34%, which leads us to conclude that most corporate boards of listed Tunisian companies are held by directors and executives share-holding. In addition, regarding the variable "OCON" that presents in average 67.48%, a quarter of our sample in average presents 58.8% of companies with block-holders. The majority of listed Tunisian firms have about 76.92% ownership concentration on average. These allow us to conclude that the Tunisian environment is characterized by concentrated ownership of private companies. Finally, we note that "AUD" is implemented in 28.80% of cases, and companies hire at least one auditor represented by an international external audit firm (BIG4). Table 1 in appendix reports the descriptive analysis for control variables.

7. EMPIRICAL RESULTS

Conducting multiple linear regressions allowed us to decipher several results (table 4). Our empirical analysis conducted has validated the first hypothesis, but the relationship seems insignificant. This result is inconsistent with the work of Minnick and Noga (2010) and Lanis and Richardson (2011). However, our result is consistent with Aliani *et al.* (2011) in French context and Aliani and Zarai (2012) who founded non-significance in the American context. According to our forecasts, the smaller corporate board is likely increases the decision-making and regulatory compliance and thereby reduces the amount of tax aggressiveness.

The result found in our analysis confirms our second hypothesis. This result corroborates also the study of Aliani and Zarai (2012). The variable gender diversity on the board is very significant at the 1% level (p-value = 0.000) with a positive sign, implying that the higher percentage of women increases the effective tax rate (tax aggressive activities are low). In other words, the presence of women directors impacts negatively tax aggressiveness of Tunisian companies.

In contrast, if a company engages an external auditor BIG4, it is likely to be less aggressive tax. In our study we found a negative, but not significant, relationship between the quality of the external auditor BIG4 and ETR.

Table 4: Estimation results of the econometric model with random effects

Independents Variables	Coefficient estimated α	Std. Err	Statistic T	Significance p-value	Signe estimated	Signe observed
BSI	-.0152	0.020	-0.76	0.449	-	-
DIV	0.500	0.107	4.66	0.000***	+	+
AUD	0.0121	0.011	1.12	0.261	+	+
MOWN	0.070	0.024	2.96	0.003***	+	+
OCON	-0.080	0.038	-2.12	0.034**	-	-
SIZE	0.009	0.004	2.04	0.042**	+	
DEB	0.101	0.023	4.31	0.000***	+	
ROA	0.091	0.075	1.21	0.224	+	
MKTBK	-0.007	0.002	-3.00	0.003***	-	
SECP	-0.053	0.013	-4.15	0.000***	-	
Cons	0.047	0.093	0.51	0.611	+	
Wald chi2 (10) = 184.03				Prob > chi2 = 0.0000		

*** Significance 1%   **5% Significance * 10% significance

The table above shows the existence of a negative relationship and statistically significant at the 1% level (p-value = 0.003) between the managerial ownership and tax aggressiveness. This result is consistent with the results found by Chen *et al.* (2010) which confirm that high percentage of managerial ownership impacts a lower level of tax aggressiveness but this is contrary to the result obtained by Ying (2011).

Therefore, this result confirms our fourth hypothesis. As a result, companies that have substantial holdings of executives and directors on their boards are less aggressive on tax. According to our predictions, the results of our analysis confirms the existence of a positive impact on the threshold of 5% (p-value = 0.034) between the concentration of ownership and tax aggressiveness. This is consistent with the results of Ying (2011) and Chen *et al.* (2010), which respectively indicate the existence of a positive relationship between ownership concentration and the level of tax aggressiveness in non-family businesses and which are not controlled by the state. It is interesting to find that the high ownership concentration increases the magnitude of the tax aggressiveness of Tunisian companies.

Regression analyzes also reveal that some companies' characteristics have a significant effect on the tax aggressiveness. We note that company size and debt levels are able to reduce tax aggressiveness. However, the level of growth and privileged sector of the company reinforces tax aggressiveness activities. Overall, we can conclude that some governance mechanisms have a significant impact on reducing the level of tax aggressiveness of Tunisian companies, but it seems surprising that some of these mechanisms encourage reducing taxes.

8. CONCLUSION

This paper aims to examine the effect of some corporate governance's mechanisms on corporate tax aggressiveness. Based on a 250 firm-year dataset of 39 Tunisian listed firms over the 2006–2012 periods, our regression results indicate that diversity in gender on corporate board, managerial and concentration ownership have a significant effect on firms' tax aggressiveness activities.

The results generated allow us to decipher several meanings attaching to the issue of tax aggressiveness. In this case, the majority of our assumptions based on agency and stakeholders theories have been confirmed.

The results highlighted the role of diversification in the board of directors and managerial ownership on the reduction of tax aggressiveness. In contrast, the ownership concentration seems to strengthen the tax aggressiveness. This is explained by the fact that the controlling shareholders maximize their utility and transfer wealth through the complexity of aggressive fiscal activities, which serves as myopia and allows opaque their opportunism and extraction of wealth at the expense of minorities.

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APPENDIX

Appendix 1: Descriptive statistics of the control variables of the sample

Control variables	Obs	Mean	Std. Deviation	Min	Max	25%	50%	75%
SIZE	250	17.973	1.198	13.247	20.173	17.400	17.944	18.857
DEB	250	0.1388	0.201	0	0.802	0	0.055	0.193
ROA	250	0.059	0.0804	-0.679	0.263	0.019	0.045	0.102
MKTBK	250	2.457	2.352	-3.465	26.04	1.105	1.876	3.309
Dummy variable	Frequencies			Proportions				
	0	1		0			1	
SECP	145	105		58			42	

SIZE: natural logarithmic of total assets; DEB: percentage of long-term debt relative to total assets s; ROA: ratio of operating income to total assets; MKTB: ratio of the market capitalization of the company and the book value of equity; SECP: dichotomous variables equal to 1 if the firm belongs to a privileged sector and 0 if not

Appendix 2: Hausman test results

Variables	Coefficient		Difference (E. Fixes - E. Aléatoires)	Sqrt (diag (V_b-V_B)) S.E.
	Fixed effect	**Random effect**		
BSI	0.121	0.061	0.059	0.053
DIV	0.396	0.526	-0.130	0.095
AUD	0.017	0.004	0.012	0.027
MOWN	0.145	0.091	0.053	0.055
OCON	-0.235	-0.135	-0.099	0.124
SIZE	0.005	0.009	-0.004	0.013
DEB	-0.057	0.057	-0.115	0.112
ROA	0.193	0.152	0.040	0.077
MKTBK	-0.007	-0.006	0.009	0.002

$Chi^2 (9) = 7.70$ Prob>chi^2 =0.5643