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TAX AGGRESSIVENESS AND THE EFFECT OF FINANCIAL DISTRESS IN A CRISIS PERIOD: EMPIRICAL EVIDENCE FROM PORTUGUESE AND SPANISH LISTED FIRMS

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Biographical note

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She started her professional career in September 2018 with an internship in the tax department at Deloitte in which she continued after the 6 months of the curricular internship.

This master thesis is presented with the purpose of finishing the Master Degree started in 2017.

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Abstract

Corporate tax aggressiveness has been, in recent years, very discussed by governments, politics and public media. Thus, this study gives an overview of the operational and financial firm's characteristics that may influence managers to follow more or less aggressive tax strategies. Additionally, we analyse the impact of financial distress on tax aggressiveness and if external economic depressions, in particular the global financial crisis of 2008, impacts the association between tax aggressiveness and financial distress.

Based on a sample of 199 Portuguese and Spanish listed firms for the period between 2006 and 2018, the results show that larger firms, more profitable and that prefer debt financing, use to be less tax aggressive than there contra parts. Contrarily, the ones with more capital intensity tend to be more tax aggressive. Additionally, the results show that firms under financial distress, in special in the period of the global financial crisis, tend to magnified strategies that allow them to avoid taxes and to obtain an alternative procedure to finance their operations.

Key-words: Tax aggressiveness, tax rates, financial distress and global financial crisis

JEL-codes: G01**,** G30, H20, H26

Resumo

A agressividade fiscal das empresas tem vindo, nos últimos anos a ser muito discutida a nível mundial não só pelos governos e políticos, mas também pela comunicação social. Neste sentido, o presente estudo apresenta uma visão global das características financeiras e operacionais das empresas que podem influenciar a decisão dos gestores no sentido de optar por estratégias fiscais mais ou menos agressivas. Adicionalmente, é estudado o impacto de uma empresa com dificuldades financeiras (stress financeiro) na agressividade fiscal da mesma e ainda se depressões económicas externas ás empresas, em particular a crise económica de 2008, teve impacto na correlação entre a agressividade fiscal e o stress financeiro das empresas.

Com base numa amostra de 199 empresas portuguesas e espanholas cotadas para o período de 2006 até 2018, os resultados mostram que empresas maiores, mais rentáveis e que recorrem a financiamento através de capital alheio, tem tendência a ser menos agressivas com as suas políticas fiscais. Por outro lado, as empresas com maior intensidade de capital são, tendencialmente, mais agressivas. Adicionalmente, os resultados mostram que empresas com perturbações financeiras, especialmente em períodos de crise económica, tendem a optar por estratégias fiscais mais agressivas e que lhes permitam diminuir a sua carga fiscal e assim obter uma via alternativa de financiamento para as suas operações.

Palavras chave: Agressividade fiscal, taxas de imposto, stress financeiro e crise económica

Resumen

La agresividad fiscal de las empresas en los últimos años, tiende a ser un tema muy mediático y debatido a nivel mundial por gobiernos, políticos, pero también por la comunicación social en general. En este sentido, este estudio presenta una visión global de las características financieras y operacionales de las empresas que pueden influenciar la decisión de gestores de optar por estrategias fiscales más o menos agresivas. Adicionalmente, en esta investigación se estudia el impacto de las dificultades financieras de una empresa en la agresividad fiscal de la misma. Además, se estudia también si las depresiones económicas externas a las empresas, en particular la crisis económica de 2008, tubo impacto en la correlación existente entre la agresividad fiscal y las dificultades económicas de las empresas.

Con base en una muestra de 199 empresas portuguesas y españolas con cotización en bolsa entre 2006 y 2018, los resultados nos muestran que empresas más grandes, más rentables y las que prefieren capital ajeno como forma de financiamiento, tienden a ser menos agresivas con sus políticas fiscales. Por otra parte, las empresas que tienen un más elevado nivel de intensidad de capital, tiende a ser más agresivas. Además, los resultados muestran que empresas con dificultades financieras, en especial en periodos de crisis económica, tienden a optar por estrategias fiscales más agresivas que les acaban permitiendo obtener una disminución en la carga fiscal y así obtener una vía alternativa de financiamiento para sus operaciones.

Palabras clave: Agresividad fiscal, tasas de impuesto, estrés financiero y crisis económica

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1. Introduction

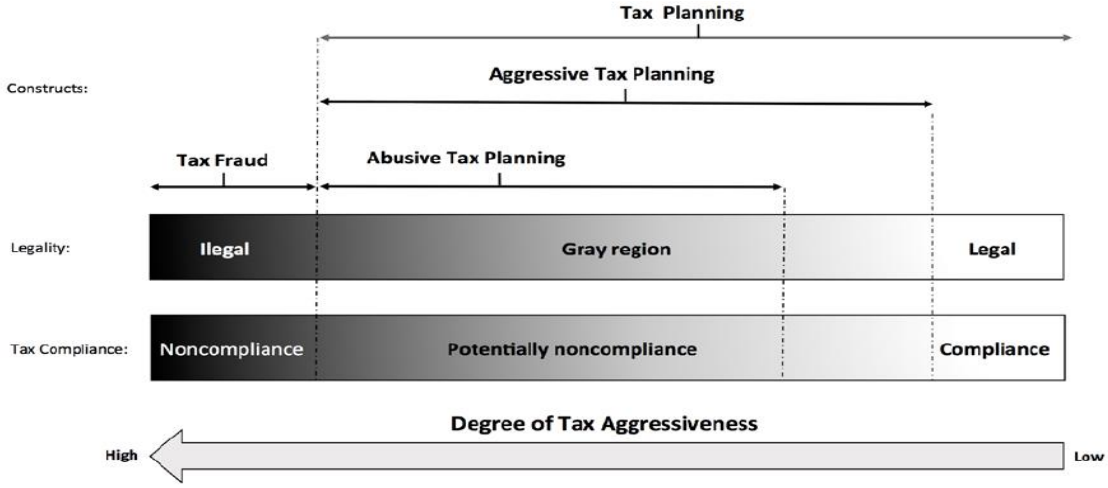
Taxes, as we know them represent a key factor not only for the general population life but also they are a strong and highlighted theme in corporate decisions. At present, there is a growing interest in the issues associated with tax aggressiveness and tax planning. This topic has become not only a theme of interest for politics or economists, besides this, what we have been observing in recent years is a growing public interest towards corporate decisions, especially the ones related with taxation.

When we talk about taxation, there is always a discussion raised and consequently, tax aggressiveness rise as well. Many, as Whait *et al.,* (2018) and Jenkins and Newell (2013), argue that taxation is the representation of the companies contribution to the society since they benefit from public infrastructures. However, other researches argue that companies already contribute to society in different ways as in development, innovation and job creation and that " *there is one and only one social responsibility of business-to use its resources and engage in activities designed to increase its profits*" (Friedman, 1970, p. 6). These different perspectives and opinions are the ones responsible to feed the growing interest in the business taxation field.

If we go back in time a few years ago, we will be able to find where, in time, tax aggressiveness turned into a much polemical and global theme. The global financial crisis was a decisive point since countries in all the distinct continents started to face financial, economic and also social problems. In fact, this end up in a global action plan by OECD that provided a set of universal guidelines for all countries that would decrease the liberty of companies to engage in tax aggressive practices (Base Erosion and Profit Shifting - BEPS) (Whait *et al.,* 2018).

The company's goal of reducing the amount of taxes paid has been classify with different names by similar and previous studies. Desai and Dharmapala (2006) and Dyreng *et el.,* (2008) labeled it as *tax avoidance* and defend that it represents any action that intends to decrease the amount of taxes to pay. Armstrong *et al.,* (2012) gave it the name of *tax planning*. Additionally, alternatively it can be considered as *tax management* and defined as the capability that companies may have in order to minimize the amount of taxes to pay (Minnick and Noga, 2010). Tax aggressiveness is, for some authors, related with a strong tax avoidance, and can sometimes be considered as closer to the

Figure 1: Tax planning and degree of tax aggressiveness



Source: *Martinez (2017)*

illegal. This grey area between illegal and legal where tax aggressiveness sometimes falls is the aspect that researchers are more concerned about (Hoi *et al.,* 2013).

Considering the several definitions and opinions regarding tax aggressiveness, it is important to notice that, what we are studying here should not be seen as the same as tax evasion and it should be distinguished. On one hand we have, as referred before, tax avoidance or more specifically tax aggressiveness that are a legal company strategy that intends to reduce tax obligations by minimizing tax liabilities within the framework of the law. On the other hand, tax evasion is illegal and includes fraud (Dover, 2015). In this paper, we are going to focus only on the legality field of minimizing the tax burden.

Unfortunately, there is not one single and unique definition of tax aggressiveness among all the researchers in the tax field. In this sense, depending on the different proxies used to measure it and on the research questions, different definitions can be used. According to Bird and Davis-Nozemack (2018, p. 1010), "*Tax avoidance, the pursuit of transactions and structures in order to reduce tax responsibility in a manner that is contrary to the policy of spirit of government legislation*". Additionally, also Lee *et al.,* (2015, p. 21) define tax avoidance as a corporate strategy that goes over the legal burden *"Tax avoidance represents a firm's deliberate efforts to reduce its tax liabilities through either legal or illegal, means or strategies"*. On the meanwhile, and in order to minimize the confusion over semantics, our study is based on the definition used by Martinez (2017) that says that tax aggressiveness is the behavior of trying to avoid or

minimize the explicit tax burden of the corporation under legal conditions. Additionally, to illustrate the position of our study, we present bellow an illustration from Martinez (2017) that clarifies the possible classifications of tax planning.

It is commonly and generally known that taxation is an essential source of revenue concerning the development of public policies by the different states. Regarding this, investigations in order to analyze which factors may impact the amount of taxes paid by companies became very helpful for policy makers and regulators and also revealed to be an important contribution to the domestic tax systems definition.

Considering that taxes are a key component of macroeconomic policies, we can easily conclude that they are also very significant for company's strategic decisions.

Taxation represents a high cost to the firms and so it necessarily affects its performance. Besides, if we consider that the final objective of company's activity is to generate value to shareholders, behaviors to reduce the tax burden are aligned with that purpose. Therefore, in the recent years, there has been an increasing interest to discover practices to decrease the company's tax burden leading us to an increase in the degree of tax aggressiveness.

According to this perspective and regarding our personal interest with the fiscal world, we intend to study whether the specific characteristics of companies are determinants or not of the tax aggressiveness degree in the Portuguese and Spanish listed companies. In this sense, this dissertation will focus on the study of the impact of financial and operational characteristics of the Portuguese and Spanish companies and, in special, we will study the impact of financial distress on tax aggressiveness. Furthermore, the impact of the Global Financial Crisis on the association between tax aggressiveness and financial distress will be examined.

This study aims to contribute to the existence literature on the possible determinants of corporate aggressive taxation, in special studying the impact of financial distress on it. Also, we aim to analyze whether the global financial crisis from 2008 magnifies, or not, the relation between financial distress and tax aggressiveness. To the best of our knowledge, this paper is the first to formally test these determinants of aggressive tax behaviors regarding the specific case of Portuguese and Spanish companies.

In order to achieve our objective we intend to measure the degree of tax aggressiveness based on a proxy of an effective tax rate (ETR). Although there are diverse measures of tax aggressiveness considering all the similar studies, the one to be used will be ETR since it is

the more appropriate regarding the available data.

Besides this section, this dissertation is divided in six more: Section 2, where a literature review and the main research hypothesis are presented. Section 3, where the variables definition are presented. Section 4, where the data collection and sample selection are explained. In section 5, the methodology and the univariate analysis are present. Section 6, where the results of our analysis are reported. And finally, in section 7 the dissertation is concluded presenting the limitations and future research directions.

2. Literature review

After analyzing the different definitions of tax aggressiveness it seems also important to understand what can lead a company to be more or less aggressive, in other words, we need to know what are the costs and benefits of being a tax aggressive firm. The first, and most direct benefit is the increase of the savings of the company that will be split not only for the shareholders but also for the managers (if they compensated by the effort in tax management). On the other hand, and besides all the costs with the invested time, effort and financial costs with all the background of tax planning, there can be also some reputational costs correlated with engaging in aggressive tax avoidance activities when we consider the corporate social responsibility. Besides, if we think carefully, in order to minimize the amount spend in taxes companies need to lower the tax burden and consequently the reported earnings, what could lead to a potential price discount imposed by other shareholders (Chen *et al.,* 2010).

For instance, there are some characteristics that, according to previous studies, can influence firm's tax aggressiveness that were included in our analysis and that are presented below.

The recent studies about tax aggressiveness have been proving that not only the external agents count into the level of aggressiveness that the companies put on when dealing with taxation. Financial and operational specific firm's characteristics also determine and impact the way taxation is treated.

2.1. Firms financial and operational specific characteristics

One of the firm's specific characteristics most used in order to study tax aggressiveness is an indicator of the firm size.

On the one hand, according to the political cost theory, a bigger company is more averse to the risk of having aggressive tax behaviors, and so the degree of tax aggressiveness will be lower on bigger firms. Big companies used to be more controlled and regulated by government actions. Besides, this kind of companies are more publicly exposed which pressure them to a corporate behaviour more contained and socially acceptable (Zimmerman, 1983). The empirical test made by Zimmerman (1983) to the relation between firm size and ETR lead to a positive relationship.

On the other hand, the political power theory argues that large firms as they are also more powerful than the smaller ones will be able to use their power and resources to influence in their favour the tax burden (Siegfried, 1972). Considering this theory there is a suggestion of a negative relation between the firm's size and the ETR which lead us to a higher degree of tax aggressiveness.

In recent years there were several studies that tried to understand the relation between the size of the firms and their tax behaviour. For example Rego (2003) and Belz *et al.,* (2019) report a positive correlation with tax aggressiveness and so they are consistent with the political cost hypothesis. Contrarily, Dyreng *et al.,* (2008) support the political power theory since they find a positive correlation between firm's size and the ETR. In this sense, previous studies were not able to find an unanimous impact of the firm's size in the ETR and consequently in the degree of tax avoidance in companies. However, we predict there is in fact a relation between this two variables but we are not able to define the direction of it.

H1: The size of a company is related with the degree of tax aggressiveness.

Along with firms' size, also the financing and investment decisions can have an important impact in firm's behavior considering taxation. As there is a different fiscal treatment depending on the financing source of firms, the capital structure of the companies, i.e. whether a firm chose equity or debt financing is fundamental to investigate when we are trying to assess the factors that influence the aggressiveness of firm's considering taxation. On the one hand, the cost with equity financing, i.e. the remuneration of investors, is not tax-deductible, however it can be cheaper than debt financing. On the other hand the tax-deductible nature of interest expenses leads companies to choose for a debt financing. Although, in line with the firm's size and since the capital structure theory from Miller (1977), researchers have continuously reached nonconsensual conclusions regarding the association between firm's leverage and tax aggressiveness (Nguyen, 2016). For example, Dyreng *et al.,* (2008) in their study about corporate tax avoidance, concluded that on average, firm's that have more equity financing tend to be less tax avoiders than the ones that employs more debt financing. In contrast, if we look to a more specific research where the association between tax aggressiveness and leverage was studied for Portuguese private firms, the conclusion is the opposite, i.e., the level of tax aggressiveness in Portuguese private firms increases as debt level becomes lower (Bartholdy and Mateus, 2011). Hence previous studies

has not achieved a consensual conclusion, although, as our sample contains Portuguese firms, we expect firm's leverage to influence positively the ETR and consequently, negatively the degree of tax aggressiveness.

H2: Firms' leverage is negatively correlated with the degree of tax aggressiveness.

According to M. Hanlon and Heitzman (2010, p. 147) *"The fundamental rule for investment is simple: invest as long as the marginal benefits exceed the marginal costs"*. Actually, to understand the benefit of an investment project, there is a need to include taxes in it since the uncertainty of tax payments, the timings or the amounts will influence the result of the present value of the investment and, in this sense, it will influence the manager's decision.

Considering the above, we study the influence of the firm's investment decisions in the firm's level of tax aggressiveness and, in order to capture these effect, two different proxies were included. The first one is capital intensity that, according to Gupta and Newberry (1997) will be negatively correlated to the effective tax rates and consequently, positively to tax aggressiveness since more capital-intensive firms will have tax advantages manipulating the different depreciation methods differing or accelerating the depreciation. The second measure used by previous studies as Gupta and Newberry (1997) and Richardson and Lanis (2007) is inventory intensity. In fact, they document that there is a positive relation between increasing stocks and ETR and consequently, a negative one with tax aggressiveness.

The inclusion of capital and inventories intensity in the study of tax aggressiveness is not consensual among researchers. There are some authors that defend that the fiscal benefits raised by this asset mix variable that create discrepancy between taxation and accountability will be absorbed by the deferred component of the measure of tax aggressiveness (Kraft, 2014).

Consequently, and in opposition to (Kraft, 2014) we expect capital intensity to have a positive correlation to tax aggressiveness and inventories intensity to be negatively correlated with corporate tax aggressiveness.

H3: More capital intensity firms present a higher degree of tax aggressiveness;

H4: Inventories intensity is negatively related the degree of tax aggressiveness.

Also, when we look at the amount of taxes paid by a company we need to pay attention to the firm's profitability. In the one hand we can think that a more profitable firm will have higher tax rates and so pay more taxes than a less profitable one that is what happens according to Richardson and Lanis (2007). However, on the other hand, other studies defend the opposite, more profitable corporations invest more in tax planning and in the end are more tax aggressive than the less profitable ones (Rego, 2003) and additionally, will be able to use in a more efficiently tax deductions (Manzon and A.Plesko, 2002).

Regarding the oppositions between several studies about the relation between the profitability of firms and the degree of tax aggressiveness, we expect this two variables to be related but we do not predict the direction of this relation.

H5: The profitability of a company is related with the degree of tax aggressiveness.

Finally, for controlling firm's growth, we include the market-to-book ratio that according to several studies it represents a companies' specific characteristic that may influence the tax aggressiveness degree. Considering previous research, there are conflicting results obtained from this variable regarding the predicted sign of the correlation between market-to-book ratio and the tax aggressive measure. Lanis *et al.,* (2017) found a positive significant association between those two variables, however, other researchers found a negative one.

Regarding the conflicting results obtained in previous researches, we compute the following hypothesis:

H6: Market-to-Book value is related to tax aggressiveness

2.2. Corporate financial distress and tax aggressiveness

In recent years, the level of tax aggressiveness in companies is being connected with the most different variables, some more specific and internal and some others external to the company and harder to control. In this sense, and as the firms are not closed ecosystems, it establish connections with the real world and with all it is vulnerable to all the changes that occur in it. Considering this, changes in the economic and financial world will impact the companies and their strategies.

When a firm is facing a financial distress, it seems intuitive that the necessity to obtain cash will lead to a deviation of the management from the current strategies. In this sense,

when in a period of financial distress, companies became less risk averse and tax aggressiveness behaviors became more appealing (Richardson *et al.*, 2015).

Financial distress will lead companies to adopt higher risk strategies and behaviors as the need to obtain cash and to decrease the tax expense outflow increases. According to Brondolo (2009), the management of firms in situations of financial distress may face the tax authorities, as being less restrict in this circumstances and that tax aggressive strategies will be better accepted by the society.

Continuing with the management topic, previous studies find an increase in the incentive of managers to manipulate taxable income when the companies dive in to situations of decreasing earnings. In fact, according to Phillips *et al.,* (2003), firms with lower earnings increases have higher average deferred tax expenses when compared with companies facing small earning decreases. Additionally, firms with higher book-tax differences (that represent one of the several forms of measuring tax avoidance) usually present weaker earnings and smaller cash flows when compared with companies that reaches lower book-tax differences (Hanlon, 2005) . In this perspective, the expected result of this study lead us to a positive relation between companies in periods of financial distress and the increase of tax avoidance in those same companies. Furthermore, we expect firms management to adopt more aggressive strategies in order to reduce the corporate tax liabilities and consequently mitigate the bankruptcy risk as companies will have available an extra amount of capital to finance the company operation.

Accordingly to the above, we formulate the following hypothesis.

H7: Corporate financial distress is positively associated with tax aggressiveness

2.3. Global Financial Crisis and tax aggressiveness

Additionally to the internal changes and corporate constraints, companies are also continuously exposed and vulnerable to external variables that also influence their performance and behaviors. Therefore, the Global Financial Crisis (GFC) of 2008 represents an unique setting to analyze how sensitive companies are to the external economic changes. In this sense, we are also going to study the impact of the GFC in the tax avoidance strategies practiced by companies.

During 2008 governments all around the world forecasted a reduction in tax receipts raised by the Global Financial Crisis that was being faced. Due to the decline of the financial

and economic conditions of the global economy, firms risk of bankruptcy increased and may the potential costs (e.g., reputational costs, risk of auditing) of tax aggressive behaviors may be perceived as irrelevant when compared with the potential gains.

According to Brondolo (2009), during the years of the GFC there is a heightened risk of tax non-compliance and consequently aggressive tax behaviors increased in the periods after 2008.

Considering this, an additional analysis of our regression model will be performed in order to test whether corporate tax aggressiveness was magnified in result of 2008 GFC in the Iberian Peninsula.

Based on previous research, we expect that the GFC has a positive impact in company's tax aggressiveness and we compute the following hypothesis.

H8: The GFC is positively associated with corporate tax aggressiveness

H9: The GFC magnifies the impact between financial distress and tax aggressiveness.

3. Variable definition

3.1. Dependent Variables

Previous studies showed that the main challenge that these kind of paper face is to find the correct measure of tax aggressiveness since companies have high incentive not to reveal their tax aggressive activities. Thus, one of the main challenges this paper faces is exactly to find the right proxy to measure tax aggressiveness. Therefore, over the past years, innumerous different measures for tax aggressiveness have been created but all of them present different characteristics and limitations (Gebhart, 2017).

If we examine similar papers and how they measured the degree of tax aggressiveness in companies we can easily identify two different ways of measuring that are highlighted by researchers. The first one is the effective tax rate (ETR) based measure and the second one the book-tax-differences (BTD) or book tax-gap (BTG) based measures.

Starting by the effective tax rate, it can be defined as the average tax-rate that a company pays regarding its pre-tax profits. It is achieved by a measure of tax liability divided by a measure of pre-tax income (Gebhart, 2017). Consequently, it captures the average rate of tax per euro of income or cash flow. Therefore, if two companies have equal pre-tax profits but in the end pay distinct amounts of income taxes, the firm that pays less taxes will achieve a lower ETR and it will be considered more tax aggressive. (Hanlon and Heitzman, 2010).

The second measure that is highlighted in the similar studies is the book-tax-differences based measures. This kind of approaches uses differences between the financial income and taxable income. This measure is often defined as the difference between pre-tax income - financial statement (book-income) - and the taxable income - the tax return - (Manzon and A.Plesko, 2002).

Although it seems intuitive that the second measure presented above (book-tax differences) can give information about tax avoidance behavior, it is a more complex measure to apply due to the limitations of data that we face - the information needed to compute the book-tax differences is harder to document since accurate tax outcomes are difficult to obtain. In fact, the majority of the different tax aggressiveness proxies are achieved from financial statement data since information about tax returns is not easy to obtain as for most of the companies is not publicly available (Hanlon and Heitzman, 2010).

Previous studies already proved a relation between ETR and diverse firm characteristics such as income, size, ownership, leverage, firm performance, capital intensity, board of

member gender and executive cash compensation. And so, considering the objective of our research and the data that we have access to, the measure that will be used to compute a proxy of tax aggressiveness is the effective tax rate based measure.

Considering the ETR, there are several authors that have considered different ways of measuring it. On the one hand, the numerator of the ratio can be computed as the current tax expense as Rego (2003) defend or, if we consider the approach used by Minnick and Noga (2010), Chen *et al.,* (2010) and Armstrong *et al.,* (2012) we can compute the ETR including in the nominator the total tax expense. This second approach seems to be more complete and accurate since it also measures the tax deferral strategies. Therefore, this dissertation is in line with this second approach. On the other hand, the denominator can also be computed in different ways from the ones we highlight three: financial income; taxable income; cash flow from operation. However, some authors argue that, as the taxable income as well as the total tax expense are calculated after tax adjustments, we cannot compute ETR with this nominator and denominator since we will not be able to detect the variations resulting from these adjustments and the results could be biased. Therefore, our model will be estimated based on two different alternatives regarding the denominator - Pre-tax income and cash flow from operations.

$$ETR1 = \left(\frac{\text{Total Tax Expense}}{\text{Pre} - \text{tax income}}\right) * 100$$

$$ETR2 = \left(\frac{\text{Total Tax Expense}}{\text{Cash flow from operations}}\right) * 100$$

The ETR measure will represent our explained variable and the ones related with the firms characteristics will be the explicative ones.

3.2. Independent variables

In order to understand how the different company characteristics under analysis influence the degree of aggressiveness in companies we need to define the independent variables to introduce in our model.

Thus, the financial and operational characteristics (independent variables) that are intend to be analyzed are: the Size of the company (SIZE), calculated as the natural log of total assets; the firms leverage (LEV), measured as the long-term debt divided by total assets. Moreover, the firm's financial investment decisions will be measured by the capital intensity (CPINT), represented as the net property, plant and equipment divided by total assets, and by inventories intensity (INV) that is measured as the ratio between total inventories and total assets.

Additionally, to control firm's profitability we included the variable Return on Assets (ROA) measured as pre-tax income divided by total assets, and to control for the company's growth an additional variable is used, Market-to-Book Ratio (MKTBV), and is defined as the market value of the company equity divided the equity's book value.

Finally, our study include one more variable that may influence the firm's tax aggressiveness. Corporate financial distress that is calculated according to the Altman Z-Score Plus model that represents a revised and adapted model of the Altman Z-Score model (Z) (Altman, 2000).

$$ALT = \text{ALT1} * 3{,}107 + \text{ALT2} * 0{,}998 + \text{ALT3} * 0{,}420 + \text{ALT4} * 0{,}717 + \text{ALT5} * 0{,}847$$

Where:

- ✓ ALT_1 = Earnings Before Interest and Taxes (EBIT) / Total Assets
- ✓ ALT_2 = Net Sales / Total Assets
- ✓ ALT_3 = Book Value of Equity / Total Liabilities
- ✓ ALT_4 = Working Capital / Total Assets
- ✓ ALT_5 = Retained Earnings / Total Assets

In the table below, all the variables and the correspondent definition used in this study are synthetized.

Table 1: Variables definition, database and expected sign

Variable	Definition	Database	Sign (ETR)
	Dependent Variable		
ETR1	(Total Tax Expense / Pre-tax income) *100	Datastream	
ETR2	(Total Tax Expense / Cash flow from operations) *100	Datastream	
	Independent Variable		
SIZE	Log (total assets)	Datastream	?
LEV	Long term debt / Total Assets	Datastream	+
CPINT	Net property, plant and equipment / Total Assets	Datastream	-
INV	Total inventories/Total Assets	Datastream	+
ROA	Pre-tax income / Total Assets	Datastream	?
MBV	Market to book value	Datastream	?
ALT	ALT1*3,107 + ALT2*0,998 + ALT3*0,420 + ALT4*0,717 + ALT5*0,847	Datastream	+
ALT_1	Earnings Before Interest and Taxes (EBIT) / Total Assets	Datastream	
ALT_2	Net Sales / Total Assets	Datastream	
ALT_3	Book Value of Equity / Total Liabilities	Datastream	
ALT_4	Working Capital / Total Assets	Datastream	
ALT_5	Retained Earnings / Total Assets	Datastream	

Source: author's elaboration

4. Data collection and sample selection

Considering that the main aim of the present study is to analyze if the firms characteristics referred above are related with the degree of tax aggressiveness in Portuguese and Spanish companies, and how this countries behave when in financial distress situation, it is important to define which companies will be under analysis and which database should be used in order to access all the necessary information.

Therefore, data was collected from the database Datastream – Thomson Reuters since it is one of the most complete databases that we have access to, regarding the information required to this study.

Considering this, we initially collected information from 2006 to 2018 and our sample was composed by 57 Portuguese companies, listed in Euronext Lisbon and 270 Spanish firms listed in Madrid Stock Exchange (listed and active Portuguese and Spanish firms). However, we excluded from this initial sample all the information considering the financial and insurance companies due to the significant differences regarding the accounting policies and to the different regulatory constraints that this kind of firms faces. Additionally, we exclude firms that do not present data for at least half of the years under study, leading us to a final sample of 44 Portuguese firms and 155 Spanish (2587 firm-year observations).

After this process, we analyzed our two measures of tax aggressiveness (ETR1 and ETR2) and replaced all the negative values by 0 and the ones that exceed 1 by 1, in order to correct possible estimation problems.

5. Methodology and Univariate Analysis

5.1. Methodology

In order to understand the impact of the firm's characteristics in tax aggressiveness, we need to estimate the following models considering each of the two defined measures (ETR1 and ETR2).

Model 1:

$$ETR1i,t = \alpha 0 + \alpha 1SIZEi,t + \alpha 2LEVi,t + \alpha 3\,MBVi,t + \alpha 4CPINTi,t + \alpha 5INVi,t + \alpha 6ROAi,t + \alpha 7ALTi,t + YEAR\ INDICATORS + \varepsilon i,t$$

Model 2:

$$ETR2i,t = \alpha 0 + \alpha 1SIZEi,t + \alpha 2LEVi,t + \alpha 3\,MBVi,t + \alpha 4CPINTi,t + \alpha 5INVi,t + \alpha 6ROAi,t + \alpha 7ALTi,t + YEAR\ INDICATORS + \varepsilon i,t$$

Where $ETR_{i,t}$ is the effective tax rate of firm i at time t, $SIZE_{i,t}$ is the firm i size at time t, $LEV_{i,t}$ is the leverage of firm i at time t, $MBV_{i,t}$ is market-to-book value of firm i at time t, $CPINT_{i,t}$ is the capital intensity of the firm i at time t, $INV_{i,t}$ is the inventories intensity of firm i at time t, $ROA_{i,t}$ is the return on asset of firm i at time t and $ALT_{i,t}$ (Z-Score) [1] represents the financial distress.

Additionally, ETR1 represents our first measure of tax aggressiveness (tax expense divided by pre-tax income) and ETR2 our second measure of tax aggressiveness (ratio between tax expense and operational cash-flow).

First of all, as our data presents a panel structure we used a panel data model as it involves multi-dimensional data measured over time. In fact, using panel data has several advantages since it can take explicit account of individual-specific heterogeneity, gives more data variation, less collinearity and more degrees of freedom. Also, it is better in detecting

[1] As a higher value of ALT corresponds to a lower financial distress, we decided to multiply it by -1 in order to obtain an increasing measure of financial distress for the analysis of our regression model.

and measuring the effects that cannot be captured in cross-section or time-series data.

Secondly, we decided which model should be applied to our estimation. Usually, when in the presence of panel data, the models commonly used are random effects models or fixed effects model. Considering this, the Hausmasn Specificaton test for endogeneity was performed in order to see if there is a correlation between the unique errors and the regressors in the model. Hence, the test results lead us to do not accept the hypothesis of equal coefficients and to apply the fixed effects model.

Furthermore, in order to decide if the Ordinary Least Squares method (OLS) can be performed, we need to test the presence of heteroscedastic errors in our regression analysis. Thus, we performed the White test for heteroscedasticity that revealed the presence of heteroscedastic errors (non-constant variance) what makes the common estimation methods become inefficient. In this sense, the first option to estimate our model would be the Two-Stage Least Squares (2SLS) that is an expansion of the OLS method used when the dependent variable's error terms are correlated with the independent variables. However, due to software restrictions, we used the Generalized Least Squares (GLS) method with cross-section weights and with time fixed effects.

Finally, in order to mitigate time and outliers effects, we included year dummies and winsorized the independent variables (1% and 99%).

5.2. Univariate analysis

Reached to this stage of our study, we now present the analysis of the descriptive statistics for the dependent and independent variables (Table 2). Starting by the dependent ones, we can see that on average the pre-tax earnings from Portuguese and Spanish firms represent approximately one fifth of the company's earnings (21,85% ETR1 and 18,20% ETR2). Looking at the size variable, and comparing it with previous studies we conclude that we are in the presence of median firms as it was expected to happen, on average, with Portuguese and Spanish firms. Additionally, looking at the leverage variable we can analyze the capital structure of the companies and conclude that, on average, only 22% of the corporation's assets are financed with long-term debt and only 2% of every euro invested in assets generates pre-tax income. Considering the MBV, we may say that companies can be undervalued since the book value is, approximately, three times higher than the market value. Also, the results show that the companies under analysis present, on average, 29 % of their total assets as long term assets (Net property, plant and equipment) and the inventories

represent only 10% of that total.

Looking now at our main variable (ALT), on average our measure of financial distress is 1,27 based on the Altman Z-score model which is situated in a "grey" zone[2] of financial distress.

Table 2: Statistics discriptive

Variable	N	Mean	Median	Maximum	Minimum	Standard Deviation
ETR1	1687	0,2185	0,2088	1,0000	0,0000	0,2143
ETR2	1687	0,1820	0,1118	1,0000	0,0000	0,2429
SIZE	1687	5,7799	5,7451	7,9654	3,5001	0,9544
LEV	1687	0,2214	0,2010	0,6856	0,0000	0,1652
MBV	1687	2,8186	1,6100	35,458	(8,5558)	4,9373
CPINT	1687	0,2881	0,2545	0,8570	0,0005	0,2180
INV	1687	0,1006	0,0557	0,5373	0,0000	0,1170
ROA	1687	0,0232	0,0306	0,5234	(0,4828)	0,1222
ALT	1687	1,2728	1,1467	5,8534	(3,8195)	1,2870

Table 2 (Statistics descriptive) - Variable definition: **ETR1** = (Total Tax Expense / Pre-tax income) *100; **ETR2** = (Total Tax Expense / Cash flow from operations) *100; **SIZE** = log (total assets); **LEV** = (Long term debt / Total assets); **CPINT** = (Net property, plant and equipment / Total assets); **INV** = (Total inventories / Total assets); **ROA** = (Pre-tax income / Total assets); **MBV** = (Book value of equity / Market value of equity); **ALT** = [3,107 * (EBIT/Total assets) + 0,998 * (Net sales/Total assets) + 0,420 * (Book value of Equity/Total liabilities) + 0,717 * (Working capital/Total assets) + 0,847 * (Retained Earnings/Total assets)]
Source: author's elaboration

Additionally, in order to test and analyze the correlations between the variables we performed Pearson's test (assuming that the variables follow a normal distribution) and the results are presented in table 5 bellow.

Starting by the correlation of the independent variables with ETR1, we can observe a positive correlation between SIZE and the ETR1 which lead us to a negative correlation with tax aggressiveness that is in line with the political cost theory presented before. On the same order, LEV, MBV and ROA also present a positive correlation with ETR1 and so, a negative one with the company's tax aggressiveness as it was expected from previous studies.

[2] ALT > 2.9 – "Safe" Zone;
1.23 < ALT < 2.9 – "Grey" Zone;
ALT<1.23–"Distress"Zone.
(Altman, 2000)

Looking now at our main independent variable, representing the financial distress of the companies, we can see that, as expected, companies facing financial distress will have lower ETR and consequently will be considered more tax aggressive.

Finally, when we analyze the correlation between our two dependent variables, since they only differ on the denominator, they have a positive strong correlation with each other, as it was expected. Also, the correlations of the independent variables with ETR2 have similar signs that the ones observed for ETR1, leading us to conclude that they both represent solid estimators of tax aggressiveness.

Table 3: Pearson Correlation Results

Variable	ETR1	ETR2	SIZE	LEV	MBV	CPINT	INV	ROA	ALT
ETR1	1								
	-								
ETR2	0,2555[a]	1							
	(10,8506)	-							
SIZE	0,08504[a]	0,0404[a]	1						
	(3,5035)	(1,6579)	-						
LEV	0,06387[a]	0,0410[a]	0,3156[a]	1					
	(2,6273)	(1,6826)	(13,6515)	-					
MBV	0,00522	0,02479	-0,0279	-0,0068	1				
	(0,2143)	(1,0177)	(-1,1471)	(-0,2787)	-				
CPINT	-0,05827[b]	-0,0778[b]	0,1848[a]	0,1908[a]	-0,08379[a]	1			
	(-2,3959)	(-3,2013)	(7,7187)	(7,9791)	(-3,4515)	-			
INV	-0,0464[c]	-0,01829	-0,1281[a]	-0,2409[a]	-0,0319	-0,0332	1		
	(-1,9065)	(-0,7507)	(-5,3017)	(-10,1877)	(-1,3113)	(-1,3645)	-		
ROA	0,1681[a]	0,1075[a]	0,1613[a]	-0,1443[a]	0,1277[a]	0,0193	0,0056	1	
	(6,9996)	(4,4368)	(6,7078)	(-5,9877)	(5,2843)	(0,7914)	(0,2293)	-	
ALT	-0,1499[a]	-0,1052[a]	0,0018	0,3829[a]	-0,0473[c]	0,02668	-0,1561[a]	-0,5860[a]	1
	(-6,2256)	(-4,3429)	(0,0745)	(17,0158)	(-1,9425)	(1,0956)	(-6,4867)	(-29,6872)	-

Table 3 (Pearson Correlation Results) – Variable definition: **ETR1** = (Total Tax Expense / Pre-tax income) *100; **ETR2** = (Total Tax Expense / Cash flow from operations) *100; **SIZE** = log (total assets); **LEV** = (Long term debt / Total assets); **CPINT** = (Net property, plant and equipment / Total assets); **INV** = (Total inventories / Total assets); **ROA** = (Pre-tax income / Total assets); **MBV** = (Book value of equity / Market value of equity); **ALT** = [3,107 * (EBIT/Total assets) + 0,998 * (Net sales/Total assets) + 0,420 * (Book value of Equity/Total liabilities) + 0,717 * (Working capital/Total assets) + 0,847 * (Retained Earnings/Total assets)]

a Indicates significance at the 0,01 level

b Indicates significance at the 0,05 level

c Indicates significance at the 0,10 level

Source: author's elaboration

6. Resuls and Multivariate Analysis

6.1. Multivariate Analysis

After analyzing the impact of each variable, individually, on the measures of tax aggressiveness, we now present the multivariate analysis, which involves the observation and analysis of more than one statistical outcome variable at a time.

In this sense, table 4 presents the results of our two main equations, estimated using the GLS model, as explained before. Considering this, table 4 presents in the second column the expected results based on our literature review, column 3 the regression results for ETR1 ((Total Tax Expense / Pre-tax income) *100) and column 4 the regression results for our second proxy of tax aggressiveness ETR2 ((Total Tax Expense / Cash flow from operations) *100).

Starting by looking at the bottom of table 4 we can see that for both of our regressions, ETR1 and ETR2, there is a significant adjusted R-squared. This means that, almost 19%, for ETR1, and 17%, for ETR2, of our dependent variables are explained by the explanatory ones. Though this percentages are not very high, they are in line, on average, with the R-squared obtained in similar previous studies. Additionally, as the probability of F-statistic for both regressions is 0,000 we conclude that all the independent variables included in our model are generally significant.

Furthermore, we analyzed the impact of each of the firms' operational and financial characteristics on ETRs and consequently in the degree of tax aggressiveness.

Starting by the analysis of the SIZE of the companies we conclude that they are similar in both estimations. In this sense, we conclude that bigger firms have higher tax rates (ETR1: α=1,204; t=4,0379 / ETR2: α=0,9856; t=2,9610) since there is evidence of a positive and significant correlation between the companies size and ETR. Considering this, we may say that larger companies present less tax aggressive strategies which is in line with the political cost theory as concluded by Dyreng *et al.,* (2008). In the beginning of our study (Hypothesis 1), we do not predict a sign for the correlation between SIZE and tax aggressiveness but we may now conclude that there is a negative association between them.

The second firm characteristic under analysis is the firm's leverage. This variable shows a positive strong correlation with effective tax rates (ETR1: α=16,3565; t=8,3144 / ETR2: α=9,8224; t=4,2561). Although the majority of the similar studies obtained a negative

correlation between this two variables, our results are in line with a recent study (Bartholdy and Mateus, 2011), focused on Portuguese private firms and so it is in line with our initial expectations (Hypothesis 2). This tell us that, Portuguese and Spanish companies that opt for debt financing are more risk averse and have less tax aggressive strategies.

Concerning the two variables used to study the impact of firm's investment decisions we can see that, on our analysis, the expected results were only found for capital intensity. We can see that it has a negative strong and significant correlation with both effective tax rates (ETR1: α=- 6,3910; t=-5,6018 / ETR2: α=-5,1970; t=-3,5515) and consequently we may conclude that capital intensity firms are more tax aggressive. This results support our hypothesis 3, and prove that capital intensive firms benefit more from the deductibility of depreciations and amortizations. However, when we look at the second variable used to study the investment decisions of the firms, inventory intensity, we only find statistically significant results for ETR1 (ETR1: α=-5,3142; t=-2,0032), what turns the results less robust. Moreover this results are not consensual to the previous studies since, in line with what was observed to capital intensity, inventory intensity also shows a negative correlation to the effective tax rate and consequently, a positive correlation with tax aggressiveness. In this sense, our results about the impact of inventory intensity on tax aggressiveness should be carefully analyzed since they do not allow us to achieve a robust conclusion.

Considering now the impact of the company's profitability in their effective tax rates, we can observe that, as previously defended by Richardson and Lanis (2007), there is a positive strong correlation between return on assets and both ETR proxies (ETR1: α=17,4408; t=5,0370/ ETR2: α=28,4542; t=7,0477). In this sense, we observe that more profitable firms have higher effective tax rates and consequently, are consider as being less tax aggressive than the ones that show less profitable results.

Looking now at our firm's growth control variable (MBV) we can see that, for ETR1 there is a negative relation – we do not find statistically relevant results for ETR2 (ETR1:α=- 0,1054;t=- 1,7055). In this sense, we may conclude that companies with a higher potential for growing are the ones that present lower effective tax rates and therefore are more tax aggressive.

Finally, table 4 also shows the regression results for our main variable, ALT, which measures the financial distress of the companies. Therefore, the results show that the regression coefficient is negative and the correlation is strong and significant (ETR1: α=-2,5478; t=- 7,8354/ ETR2: α=- 1,7012; t=-4,3785). Considering this, we may say that, as expected,

firm's facing financial distress problems present more tax aggressive behaviours in order to reduce their corporate tax expense. This results are in line with our expectations and also with hypothesis 6 developed above.

Table 4: Regression Results

Variable	Predicted sign	ETR1	ETR2
C		10,3580[a]	6,2982[a]
		(4,7946)	(2,6643)
SIZE	?	1,2047[a]	0,9856[a]
		(4,0379)	(2,9610)
LEV	+	16,3565[a]	9,8224[a]
		(8,3144)	(4,2561)
MBV	?	-0,1054[c]	0,0755
		(-1,7055)	(0,9387)
CPINT	-	-6,3910[a]	-5,1970[a]
		(-5,6018)	(-3,5515)
INV	+	-5,3142[b]	1,3426
		(-2,0032)	(0,3998)
ROA	?	17,4408[a]	28,4542[a]
		(5,0370)	(7,0477)
ALT	-	-2,5478[a]	-1,7012[a]
		(-7,8354)	(-4,3785)
R-Squared		0,1977	0,1777
Adjusted R Squared		0,1886	0,1684
S.E of regression		20,5506	22,7596
F-Statistic		21,7879	18,9918
Prob (F-statistic)		0,0000	0,0000
N		1700	1689
Year dummies		Yes	Yes

Table 4 (Regression results) - Variable definition: **ETR1** = (Total Tax Expense / Pre-tax income) *100; **ETR2** = (Total Tax Expense / Cash flow from operations) *100; **SIZE** = log (total assets); **LEV** = (Long term debt / Total assets); **CPINT** = (Net property, plant and equipment / Total assets); **INV** = (Total inventories / Total assets); **ROA** = (Pre-tax income / Total assets); **MBV** = (Book value of equity / Market value of equity); **ALT** = [3,107 * (EBIT/Total assets) + 0,998 * (Net sales/Total assets) + 0,420 * (Book value of Equity/Total liabilities) + 0,717 * (Working capital/Total assets) + 0,847 * (Retained Earnings/Total assets)]

[a] Indicates significance at the 0,01 level

[b] Indicates significance at the 0,05 level

[c] Indicates significance at the 0,10 level

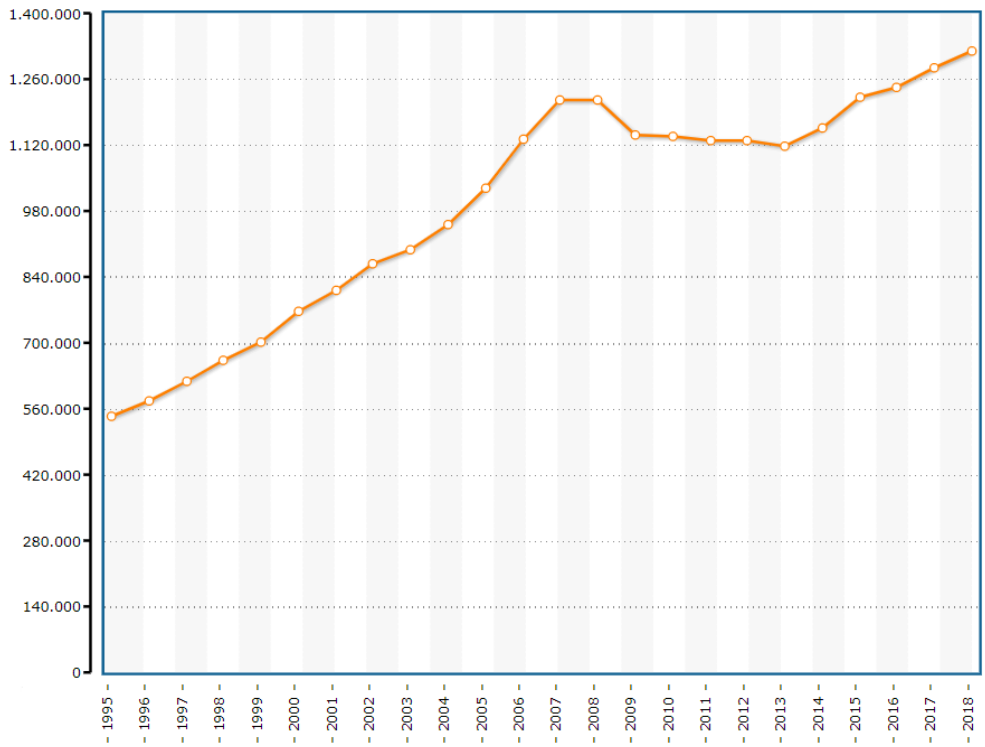
Source: author's elaboration

6.2. Additional Analysis

In order to test if the global financial crisis magnifies the impact of financial distress on tax aggressiveness we made an additional analysis considering our main study.

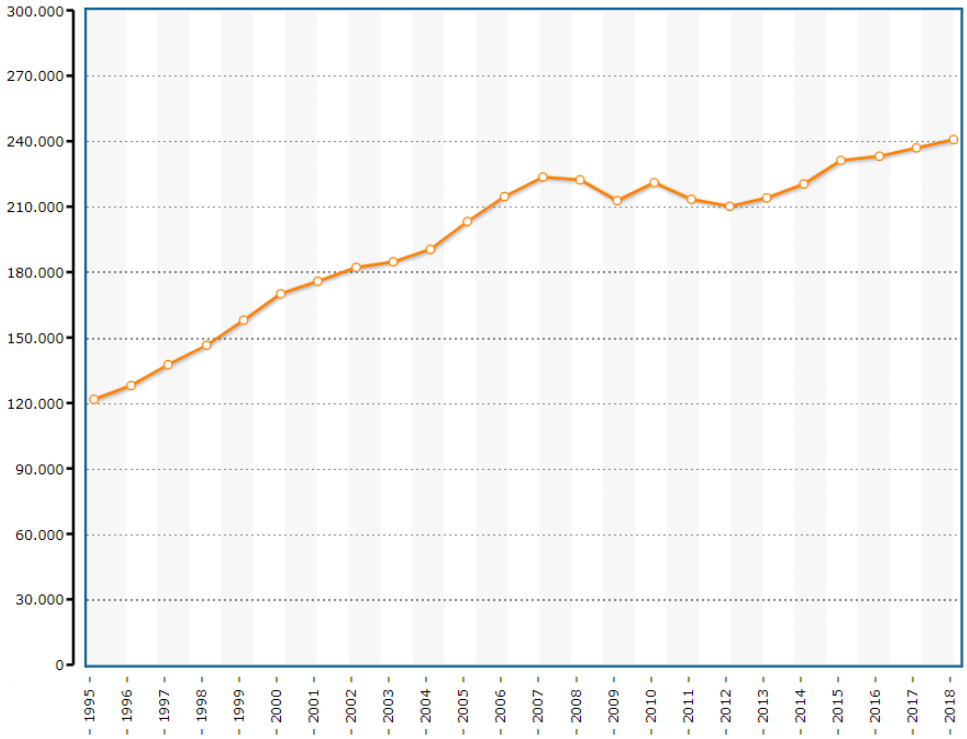
According to graphic 1 and 2, we can see how the Portuguese and Spanish economies behaved from 1995 to 2018. In this sense, we observe that both countries had grown until 2008, the year of the beginning of the global financial crisis. From 2009 until 2013 we observe a period of instability and recession in the economy defined by a decrease in the Gross Domestic Product (GDP). Looking now to 2014, we find a GDP curve inversion since it defines the end of the recession period and the start of a new economic growth cycle that continues until 2018, as we can see in the graphics bellow.

Figure 2: Spanish GDP



Source: Pordata.pt (2019)

Figure 3: Portuguese GDP



Source: Pordata.pt (2019)

Regarding this, we estimate again our two equations but now we included a dummy variable representing the global financial crisis (GFC), coded one if the observation corresponds to a period of crisis - 2009 to 2013 – and coded 0 otherwise – 2014 to 2018.

Furthermore, to formally test if the crisis magnifies the association between financial distress and tax aggressiveness, an interaction term was included in the model that comprises the financial distress variable multiplied by the global financial crisis dummy.

Model 3:

$$ETR1i,t = \alpha 0 + \alpha 1SIZEi,t + \alpha 2LEVi,t + \alpha 3\,MBVi,t + \alpha 4CPINTi,t + \alpha 5INVi,t + \alpha 6ROAi,t + \alpha 7ALTi,t + \alpha 8GFCi,t + \alpha 7GFC * ALTi,t * + \varepsilon i,t$$

Model 4:

$$ETR2i,t = \alpha 0 + \alpha 1SIZEi,t + \alpha 2LEVi,t + \alpha 3\,MBVi,t + \alpha 4CPINTi,t + \alpha 5INVi,t + \alpha 6ROAi,t + \alpha 7ALTi,t + \alpha 8GFCi,t + \alpha 7GFC * ALTi,t * + \varepsilon i,t$$

Table 5 reports the regression results for ETR2 (ETR1 regression results were not statistically significant) regarding the association between financial distress, the global financial crisis and tax aggressiveness.

Firstly, when we look to the results obtained in table 5 we can observe that, for the financial and operational firm characteristics, they are, in general, similar to the ones obtained in our main analysis.

Considering the impact of the global financial crisis, we find that regression coefficient for the dummy variable representing it is negative and statistically significant (ETR2=-3,2161), which provides support for hypothesis 8 – lower effective tax rates means tax aggressiveness. According to this results, we may say that when firms financial distress is aggravated due to a global crisis, the risk of bankruptcy increases and companies start to be less risk averse and to perceive the risks of tax aggressive activities as negligible when there is a possibility of avoiding bankruptcy, (Richardson *et al.,* 2015). Additionally, and in line with the above, the coefficient for the interaction between the global financial crisis dummy and financial distress is also negative and statistically significant (ETR2=-1,7760), providing evidence for hypothesis 9. This results show us that companies with a greater financial distress are more tax aggressive in periods of crisis.

Table 5: Additional analysis regression results

Variable	ETR2
C	12,4811[a]
	(5,5748)
SIZE	-0,0039
	(-0,0108)
LEV	16,9865[a]
	(7,3618)
MBV	0,2619[a]
	(3,0814)
CPINT	-9,0212[a]
	(-5,7669)
INV	-5,7698
	(-1,5082)
ROA	7,7023
	(1,8845)
ALT	-1,6653[a]
	(-3,7353)
GFC	-3,2161[a]
	(-3,1353)
GFC*ALT	-1,7760[a]
	(-3,5322)
R-Squared	0,1270
Adjusted RSquared	0,1213
S.E of regression	23,8071
F-Statistic	22,1262
Prob(F-statistic)	0,0000
N	1378
Year dummies	NO

Table 5 (Regression results – additional analysis) - Variable definition: **ETR1** = (Total Tax Expense / Pre-tax income) *100; **ETR2** = (Total Tax Expense / Cash flow from operations) *100; **SIZE** = log (total assets); **LEV** = (Long term debt / Total assets); **CPINT** = (Net property, plant and equipment / Total assets); **INV** = (Total inventories / Total assets); **ROA** = (Pre-tax income / Total assets); **MBV** = (Book value of equity / Market value of equity); **ALT** = [3,107 * (EBIT/Total assets) + 0,998 * (Net sales/Total assets) + 0,420 * (Book value of Equity/Total liabilities) + 0,717 * (Working capital/Total assets) + 0,847 * (Retained Earnings/Total assets)]; **GFC** = Dummy (coded 1 if crisis period, 0 otherwise)

[a] Indicates significance at the 0,01 level

[b] Indicates significance at the 0,05 level

[c] Indicates significance at the 0,10 level

Source: author's elaboration

7. Conclusion

Nowadays firms have several incentives, not only internal but also external to engage in tax strategies that allow them to reduce the tax burden due to the significant cost savings raised.

In this sense, this dissertation examines the impact of company's financial and operational characteristics on the firm's tax behaviors, in specially, it studies how financial constrained firms perceive the risks of tax aggressiveness and how the global financial crisis impacted their behaviors.

Although the tax aggressiveness theme has been widely studied, especially in recent years, this dissertation is a contribution to it since it studies which are the tax strategies determinants of Iberian companies, how they behave in financial distress situations and how the global financial crisis affected them.

Furthermore, to proceed our investigation, we collected data from Portuguese and Spanish listed firms (from where we only keep non-financial ones), over the period between 2006 and 2018. Considering this, we obtained a final sample (panel data) of 199 companies from different sectors. In order to find our results we employ two distinct measures of tax aggressiveness, ETR1 obtained as the ration between total tax expense and pre-tax income multiplied by 100 and ETR2 as total tax expense divided by cash flow from operations multiplied by 100.

In our study, we started by analyzing the financial and operational firm's characteristics impact on tax aggressiveness and we found that bigger firms have less aggressive tax strategies as stated by the political cost theory. According to (Zimmerman, 1983), larger companies used to be more exposed government regulatory actions and also publicly exposed which creates more pressure to have a more contained and socially acceptable behavior. Regarding the capital structure of the companies, we found that, firms that prefer debt instead of capital financing are the ones less tax aggressive and with higher effective tax rates as already stated by (Bartholdy and Mateus, 2011) in a study about Portuguese private firms. Also, we conclude that profitability motivates companies to be less tax aggressive since we obtained a positive strong correlation between return on assets and effective tax rates.

Additionally, we found that financial distress decreases company's effective tax rates and consequently increases the incentives for tax aggressive behaviors by firm management. These strategies may be seen as an alternative source of financing for the firms due to the amount of costs that can be saved when applying them. In this sense, firms management, when companies are in situations of financial distress, start to see the risks of tax aggressive as insignificant when

compared to the potential gains. Also, when we studied the global financial crisis of 2008, we found that it magnified the impact of financial distress on tax aggressive since the negative coefficient of the association between financial distress, measured by the Z-score model, and effective tax rates increased. Considering this, and as expected, in periods of crisis the possibility of tax non-compliance increases.

This study provides evidence not only about the impact of general financial and operational firm's characteristics on tax aggressive, but also about how the management deal with taxes in periods of severe financial distress. Due to this, this study may be helpful for Portuguese and Spanish governments, tax authorities, regulators and policymakers in order to be more careful and watchful in special in periods of economic depression regarding the increased risk of aggressive tax behaviors. Also, investors could benefit from the insights of this study when evaluating company's risk (Hutchens and Rego, 2013).

Finally, we present the limitations of our study. First, due to data access constraints, our sample only includes listed firms and it would be interesting to include also unlisted ones. Secondly, the two measures of tax aggressive are based only on current effective tax rates since tax return data are private. Considering this, and the limitations found on literature, the interpretation of the conclusions from this study should be made with caution. Finally, it is also important to highlight that, there are several other variables, such as corporate governance composition, corporate social responsibility, firm performance, and others, that can impact tax aggressive and that were not considered in our study that might be interesting to include in future research.

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