

THE RELATIONSHIP BETWEEN TAX AVOIDANCE, COMPANY CHARACTERISTICS AND CORPORATE GOVERNANCE: EVIDENCE FROM GREECE

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Abstract

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The purpose of this paper is to research a possible relationship between corporate tax avoidance with corporate governance characteristics such as board independence, the type of auditing company and the concentration of ownership, and a range of selected financial indicators such as return on capital employed, liquidity, leverage, and company size. For this reason, the analysis was based on quantitative and qualitative data derived from the annual financial reports from a sample of 56 companies listed on the Athens Stock Exchange covering the period 2011 to 2015. As a measure of tax avoidance, the cash effective tax rate was used, while a linear regression model using the random effect method was estimated in order to examine the factors that affect it. The results of the study show that the cash effective tax rate has a statistically significant positive relationship with company size and a significant negative relationship with return on capital employed. All in all, the research shows that Greek large-sized companies show less tax avoidance, whereas in companies with a high return on capital employed the extent of tax avoidance is higher. There was no statistically significant impact of corporate governance variables on tax avoidance.

Keywords: Cash Effective Tax Rate, Tax Avoidance, Corporate Governance, Audit Firms, Ownership Concentration, Board Independence

Authors' individual contribution: Conceptualization - E.C. and I.G.; Methodology - E.C. and I.G.; Formal Analysis - S.T. and E.C.; Resources - Z.H.; Writing - Z.H., E.C., and S.T.; Supervision - E.C.

1. INTRODUCTION

In today's international as well as domestic economic practice, financial and accounting scandals, extensive tax evasion and tax avoidance have been observed in several cases (Armstrong, Blouin, Jagolinzer, & Larcker, 2015; Lanis & Richardson, 2011), resulting in the emergence of stock market crises and the collapse of businesses. These phenomena destabilize the economic environment, discourage investment activity and,

eventually, hinder economic growth. Under these circumstances, capital markets, stock exchanges, international organizations, and all related stakeholders believe that corporate governance practices are a key factor in addressing these problems and are an essential measure of credibility in stock markets.

The issue of corporate governance can be understood in both a narrow and a broad sense (Nerantzidis, Filos, & Lazarides, 2012). The narrow concept involves understanding the conflict of

interest between different actors within the company (Jensen & Meckling, 1986). The broad concept includes an understanding of the functioning of the overall economic system, the institutional framework, and the business finance conditions in which companies operate. Recent initiatives in the United States by the Internal Revenue Service link good corporate governance practices to lower levels of tax aggressiveness (Lanis, Richardson, & Taylor, 2015).

This paper investigates whether elements of the institutional framework of corporate governance as well as selected financial and corporate characteristics of companies listed in the Athens Stock Exchange are linked to the amount of income tax finally disbursed as a percentage of pretax net profits, which is also used as a tax avoidance measure (Cash Effective Tax Rate or CETR). In particular, it is examined whether the amount of tax avoidance is related to the concentration of ownership, the type of audit firm (Big4) and the percentage of independent members of the board of directors, in combination with selected financial indicators, such as profitability of capital employed, liquidity, leverage and the size of the company.

This research makes a significant contribution to the relevant literature (Bayar, Huseynov, & Sardali, 2018; Oats & Tuck, 2019), as there is limited previous research to assess the income tax avoidance of Greek companies using representative tax avoidance measures, which are calculated from their published financial statements. The paper has the structure shown below.

The first part introduces the subject of this paper and explains why it is important to study tax avoidance in relation to corporate governance. The second part presents the factors that contribute to the emergence of tax avoidance and focuses on its impact on society and businesses. This chapter also includes the development of research hypotheses. In the third part, the data on the sample of the survey, the measure for determining corporate tax avoidance, and the model for hypotheses control are presented. The findings of the research are then recorded, analyzed and criticized. The article ends by presenting the conclusions and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Agency theory and tax avoidance of businesses

In companies with scattered ownership, it is not feasible for shareholders, due to their low percentage and potential lack of professional expertise, to participate in corporate governance, which is entrusted to professionals (managers), who act as their agents. Separating business ownership from decision making may be detrimental to shareholders when management takes decisions that are inconsistent with the goal of maximizing their wealth.

The agency problem was first formulated by Berle and Means (1932). Since then and until recently the interrelation of corporate governance practices with corporate tax evasion has been completely ignored (Desai & Dharmapala, 2006). However, a number of accounting scandals in the capital market of the United States, which were combined with extensive tax evasion, shifted the focus of interest

and research on taxable profits and corporate governance, especially for firms in financial distress. Indeed, research has shown that, under the condition of poor governance, tax avoidance is associated with a greater likelihood of financial distress (Bayar et al., 2018). Since the 2008 financial crisis, corporate tax avoidance has attracted public attention and calls for tax reform, increased regulation and transparency (Oats & Tuck, 2019).

Desai and Dharmapala (2006), and Hanlon and Slemrod (2007) found that companies resort to highly complex mechanisms to reduce their tax liabilities, through which they achieve, in addition to reducing their taxable profits, the virtual increase in their accounting result. In the majority of cases, managers' incentive for tax avoidance by falsifying accounting profits is to obtain personal gain, either through the fees they receive to achieve goals or by speculating with the shares they hold. Fama and Jensen (1983) argue that when the holding of share capital is concentrated in a few hands it makes sense for the executives of such companies not to be involved in high-risk activities such as tax avoidance, in contrast to the corresponding executives of highly dispersed companies in equity ownership.

Desai and Dharmapala (2006) argue that it is likely that executives will conceal through tax aggression the pursuit of earning personal gains if its relationship to tax aggression is overlapping. They also argue that poorly governed companies will behave less aggressively if they offer incentives (reimbursement in company shares) for managers to keep their interests in line with shareholders' interests. The theory of Desai and Dharmapala (2006) therefore implies that, in circumstances where tax aggression and income gaining work in an overlapping way, well-managed companies are more motivated to be aggressive from a tax viewpoint.

Hanlon and Slemrod (2007) report that the reduction in tax liabilities of companies through tax evasion is considered a beneficial action for shareholders as it results in savings and, consequently, an increase in the value of enterprises. A prerequisite for the validity of the above proposal is that this benefit is not covered by the costs that investors will incur in the case tax evasion is detected. In particular, if the tax authority is effective in its audits and detects the entire tax evasion that has taken place, the benefit obtained by the shareholders is extinguished, while they are also burdened with the amount of the fines and surcharges.

Chen et al. (2010) examined whether family businesses are more tax aggressive than non-family companies. Their research has shown that family businesses are less tax aggressive because their owners are willing to give up tax benefits in order to avoid the non-tax costs of a possible decline in the share price that may result from shareholders' concern for speculation by the executives of the company. Their results are quite consistent with the theory of Desai and Dharmapala (2006). Hanlon and Slemrod (2009) analyzed the reaction of stock prices to the news on tax aggression and found that, on average, the company's stock price declined when there was news about its participation in tax aggressive activities. Investors appear to be particularly cautious towards tax evasion firms, considering that management practices designed to mislead the tax authority are likely to also mislead the investors.

The same authors (Hanlon & Slemrod, 2007) also studied the reaction of the investing public to announcements that disclosed the companies' participation in tax evasion and found that it was negative for all enterprises, but to a smaller extent for businesses with sufficient and efficient corporate governance practices. Investors of these businesses did not believe, according to the authors, that the actions of the management were also intended to mislead them.

Fama (1980) and Fama and Jensen (1983) argue that the composition of the board is a crucial factor in creating an effective board of directors. In order to effectively monitor the management, they emphasize the value of having both internal (executive) and external (non-executive) members on the board. They further underline that the board's effectiveness lies in the existence of the right mix of internal and external members on the board.

The executive members of the company are usually the most important members of the board because they have valuable information about the company's activities that help the board in decision-making (Fama, 1980; Fama & Jensen, 1983). The board of directors is thus expected to include several people from the company's management team. However, the board will not be able to play an effective role if it cannot monitor the decisions of these individuals (Beasley, 1996). As board members have a great information advantage due to their employment in the company and the knowledge of confidential information, the board can easily become a tool to serve their interests, ignoring those of shareholders (Williamson, 1984).

Therefore, the administrative sovereignty of the board of directors may encourage executives to consult with each other and profit from the wealth of shareholders by engaging in fraudulent activities. Surveys show that executives may falsify the company's annual financial reports if by doing so they can maximize their reimbursement, which is linked to the financial performance and/or share price of the company (Fama, 1980; DeAngelo et al., 1994; Yermack, 1996). In a study that has been set in a much wider context, including incidents of financial fraud, government deception, and regulatory violations, Uzun et al. (2004) show that executives will commit corporate fraud to maximize their wealth.

The viability of the board as a mechanism triggered by the need for low-cost internal control can be enhanced by the placement of external - independent members in the board of directors (Fama, 1980). The added value brought by the external members of the board can be better appreciated by considering them as professional arbitrators whose task is to oversee competition among top executives of the company. Appointing a higher percentage of independent members on the board can increase its effectiveness in monitoring management and improving corporate compliance.

Previous studies have also examined the impact of effective monitoring on the possibility of publishing financial statements that conceal corporate fraud (DeAngelo et al., 1994; Beasley, 1996; Yermack, 1996; Uzun et al., 2004). Research shows that companies with more effective management monitoring are less likely to be involved in corporate fraud, as non-executive board

members have little incentive to engage in this type of conduct. Typically, the fees of non-executive members are not related to the financial performance and/or share price of the company and this, therefore, gives them more incentives to objectively monitor the management of the company.

Few studies to date have examined the relationship between the board of directors and corporate tax planning (Williams, 2007; Erle, 2008). However, in Australia (and in other Western countries), the members of the board have a common legal duty to have an internal control system (including the tax audit system) within the company so as to monitor the management (Ramsay, 1999; Williams, 2007). When corporate tax planning takes place within the company, board members should not neglect the duty towards shareholders and all other stakeholders of the company (Williams, 2007).

Based on a small sample of related tax aggressive and non-tax aggressive companies in Australia, Lanis and Richardson (2011) find that a higher percentage of independent consultants reduces the likelihood of tax aggression. In fact, the board of directors bears the ultimate responsibility for the company's tax affairs and is held accountable to shareholders and all other stakeholders (Erle, 2008). Recent research (Lanis et al., 2015) has shown that tax aggressiveness is positively associated with members of the board with financial experience, with members of the board with an ethnically diverse background and with CEO tenure, and negatively associated with female representation on the board. In a study on the relationship between corporate governance and tax aggressiveness Halioui, Neifar, and Abdelaziz (2016) found a negative relationship of tax aggressiveness with board size, CEO salary, and CEO duality.

If corporate tax planning is going on at a relatively low administrative level within the company, the existence of an efficient board that can properly monitor corporate tax planning and its implementation becomes even more important for the company (Landolf, 2006; Schön, 2008). Landolf (2006) argues that as the risks related to tax issues have increased, the board of directors should, as part of the risk management strategy, be directly involved in the tax planning of the company. It also confirms that the board should implement such a strategy after carefully examining the important aspects of sustainability, compatibility with business activities and tax structures, business compliance culture and the issue of paying a fair share of corporate taxes.

It is, therefore, necessary to include independent members on the board so as to safeguard the rights of minority shareholders and prevent the board from becoming a "prey" to a few high-level executives. Most surveys (Dechow et al., 1996; Beasley et al., 1999; Beasley et al., 2000; Klein, 2002; Carcello & Nagy, 2004) have found that the participation of independent members on the board of directors improves its supervisory role and reduces the likelihood of falsifying financial figures.

The study, therefore, looks at the following hypothesis:

H1: The higher the proportion of external members (consultants) on the board of a company, the lower the level of tax aggression.

2.2. Concentrated ownership and tax aggression

Khurana and Moser (2009) find that companies with higher levels of long-term institutional ownership are less tax-aggressive because institutional founders are more interested in the long-term impact of the aggressive tax strategy. Similarly, Chen et al. (2010) found that family businesses are less tax-aggressive. Family businesses have a higher level of ownership concentration, lower diversification policies, long-term goals, and greater interest in the reputation of the company (Chen et al., 2010). In addition, families are involved in the management and may influence corporate decisions. Family ownership is considered an effective organizational structure (Randoy & Goel, 2003).

Family businesses have a substantially high ownership pool that mitigates the agency costs between management and shareholders (Jensen & Meckling, 1976). Families act less opportunistically and are likely to avoid risky activities, including tax avoidance practices (Steijvers & Niskanen, 2014). In addition, family business owners have key positions within management and boards. Compared to non-family companies, family businesses are considered to be the most effective form of organization with low representation costs (Ang et al., 2000). Family ownership is also considered to be an alternative form of governance (Jensen & Meckling, 1976). This argument shows that as a hallmark of corporate governance, family ownership mitigates the potential problem of administrative opportunism and leads to less aggressive tax positions.

In addition, families take both their reputation and sanctions seriously into account. In particular, family business owners are less willing to take on aggressive tax positions because they are interested in their "family name". Family business owners regard their business as a legacy to be transferred to their successors (James, 1999). They are interested in the long-term value of their business despite the short-term benefits. Owners of family businesses have less incentive to generate additional cash flows when there is the possibility of sanctions and damage to the company's reputation if the tax authorities identify aggressive tax positions. It is therefore expected that family business owners are less likely to engage in aggressive tax practices.

Desai and Dharmapala (2008), on the other hand, found that firms with concentrated ownership have greater incentives to avoid tax because they have lower non-tax costs. Recent research, however, questions these findings of Desai and Dharmapala. Cabello, Gaio and Watrin (2019) indicate that a greater concentration of ownership in Brazilian firms does not imply less tax avoidance.

Conflicts of interest in family businesses between the key and minority shareholders arise when major shareholders have benefits to the detriment of minority shareholders (Shleifer & Vishny, 1986). Despite the potential costs of these aggressive activities, businesses can use corporate tax avoidance to hide losses, cover speculation, and mislead minority shareholders (Desai & Dharmapala, 2006; Kim et al., 2011).

In addition, families could increase their power in the company through the high number of voting rights they have in order to consolidate and increase their benefit to the detriment of minority shareholders (LaPorta et al., 1999). Family members participate in management and boards to strengthen

their power in the business. Burkart et al. (2003) report that most family businesses are run by a family member, particularly in those countries where there is no strong protection for investors' interests. Strong families make corporate decisions seeking to engage in positions that affect tax planning for higher earnings to their benefit and to the detriment of minority shareholders (Steijvers & Niskanen, 2014).

The Greek accounting environment can be characterized by the low importance of the capital market, poor corporate governance, moderate use of accruals and moderate financial accounting and tax conformity (Dimitropoulos & Asteriou, 2009). Moreover, financial reporting quality in Greece is perceived by certified public accountants to be of moderate quality, attributed mainly to earnings management, poor corporate governance, family ownership and deviation from accounting principles (Tasios & Bekiaris, 2012).

In a weakly controlled environment, family businesses are motivated to violate the minority interests and to increase their wealth to the detriment of minority shareholders; the study, therefore, looks at the following hypothesis:

H2: There is a positive relationship between family ownership and the level of corporate tax avoidance.

2.3. Auditing firms and tax aggression

Corporate governance is seen as a means of reducing tax avoidance activities. Kim et al. (2011) claim that tax avoidance reduces the risk that the share price will collapse in well-governed companies. On the same wavelength as Kim et al. (2011), Armstrong et al. (2015) examined the relationship between executive incentives and corporate tax avoidance. In their research, they pointed out that the problems of agency theory can lead executives to invest too much in tax avoidance, but they concluded that corporate governance generally shrinks tax avoidance rates.

In terms of agency theory, audit quality is essential in reducing conflicts of interest between management and shareholders (Chytis et al., 2016). Audit quality is a feature of corporate governance that controls the actions of managers and prevents accounting manipulation and potentially fraudulent activities (DeAngelo & Masulis, 1980). The external auditors are expected to provide an independent judgment in the company's financial statements. In addition, external auditors assess whether their clients adopt aggressive tax positions that may fall within the gray area and could be identified by the tax authority (Gallemore et al., 2014).

According to the recent bibliography, prestigious auditing firms avoid firms engaging in tax evasion, as they would have harmful consequences if tax authorities identified aggressive tax practices, and it could damage their reputation and credibility if those businesses engage in activities of tax avoidance (Hanlon & Slemrod, 2009). Donohoe and Knechel (2014) suggest that tax aggressive firms can expose their external auditors to risks and litigation. Lanis and Richardson (2012) argue that audit by Big4 reduces the likelihood of uncertain tax positions. Similarly, in a multinational environment, Kanagaretnam et al. (2016) found that large auditing firms are associated with lower levels

of corporate tax avoidance due to the possible damage that can be caused to their reputation.

Our study, therefore, looks at the following hypothesis:

H3: There is a negative correlation between the type of auditing firm (Big4) and the level of tax evasion by businesses.

3. METHODOLOGY AND RESEARCH MODEL

3.1. Research sample

For this survey, data were collected from the Annual Financial Reports and related notes of 56 firms listed on the Athens Stock Exchange (ASE) for the period 2011 to 2015. Financial firms were excluded from the sample because their tax avoidance proxies may be affected by the specific government measures they face, something making them different from the other firms of the sample (Halioui et al., 2016); especially in year 2011 that the restructuring of Greek debt occurred (private sector involvement, known as PSI). Banks' NPV loss from the debt exchange was estimated on average at 78% of the face amount of the old Greek Government Bonds (GGBs). For the Greek banking sector, these losses (Tax Losses Carryforward) amounted to €37.7 billion (Report of Bank of Greece, 2011). In accordance with the guidelines and criteria provided by IAS 12, for these unused tax losses, "a deferred tax asset (DTA_TLC) shall be recognized" (Chytis et al., 2015, pp. 36-40).

The data were classified and constructed in a panel format (panel data), and incorporate a total of 280 observations.

The tax-related data for the period under review for the calculation of CETR were retrieved from the "Cash Flow Statement" (IAS 7, Cash Flow Statement), according to the International Accounting Standards (IAS/IFRS).¹ The quantitative and qualitative characteristics of corporate governance were hand-collected by analyzing the relevant segment of the Annual Financial Report of the companies of the sample.

3.2. Corporate tax avoidance measure

The data from the financial statements are used by many surveys to create measures to capture corporate tax evasion. Applying ETR as a proxy for tax avoidance is effective for several reasons (Halioui et al., 2016): it reflects permanent book-tax differences (BTDs), it excludes the effect of temporary BTDs and it captures the effect of foreign operations for tax planning purposes. A higher ETR reflects less tax aggressiveness and vice versa (Halioui et al., 2016).

In this survey, we will use the measure of the cash effective tax rate (CETR), which is calculated as the amount finally paid for income tax divided by pre-tax accounting income, which is widely used in similar investigations. The CETR depicts the tax paid per dollar (or euro or other currency units) of the earned income (Chen et al., 2010). CETR is not affected by accrued tax items but by deferred tax strategies. In addition, the periods associated with taxes paid (the numerator) and earnings before taxes

(the denominator) may not be consistent (in the case of a tax audit where taxes are paid in different periods).

According to previous surveys, lower CETR rates indicate higher levels of tax avoidance. Some of these studies, such as those of Chen et al. (2010), Kim et al. (2011), McGuire et al. (2012), Hoi et al. (2013), Hanlon and Heitzman (2010), Dyreng et al. (2008, 2010), Lanis and Richardson (2011), and Richardson et al. (2013, 2015) used CETR as an indirect way to capture tax avoidance by companies. In this empirical analysis, we will use this assessment measure of corporate tax avoidance, as it has been used in the past with relatively reliable results.

3.3. Empirical model and research cases

3.3.1. Regression model

As mentioned above, we will use the CETR as a measure to avoid company taxation, in order to test our assumptions; this measure will be used as a dependent variable in linear regression analysis in an econometric model of random effects with time effects and we will look at the possible determinants of tax avoidance by Greek businesses during 2011-2015. The model examining our hypotheses (*H1*, *H2*, *H3*) is as follows:

$$\begin{aligned} CETR_{it} = & \alpha_0 + \beta_1 Firmsize_{it} + \beta_2 Roce_{it} \\ & + \beta_3 Debttoequity_{it} \\ & + \beta_4 Liquidity_{it} \\ & + \beta_5 Boardindep_{it} \\ & + \beta_6 Auditttype_{it} + \beta_7 Ownconc_{it} \\ & + \varepsilon_{it} \end{aligned} \quad (1)$$

3.3.2. Dependent variable

The dependent variable in our model is $CETR_{it}$.

$CETR_{it}$: the cash effective tax rate of a company i in year t ; defined as income taxes that are ultimately paid in cash divided by an enterprise's pre-tax profit. $CETR$ does not affect accounting profits and is not affected by changes in accounting ratios. If calculated annually, taxes paid in cash may include taxes paid on profits of different periods (Hanlon & Heitzman, 2010). As mentioned above, $CETR$ data were hand collected, primarily² from the cash flow statement of the annual financial reports of the companies in the sample as those are publicized on the official website of the Athens Stock Exchange.

3.3.3. Independent variables

The independent variables chosen to examine our hypotheses are as follows:

- *Boardindep*: independence of the board of directors of a company, measured by the percentage of independent members of the board of directors.

- *Auditttype*: type of auditing company, gets value 1 if the company is audited by one of the "Big4" auditing firms and 0 otherwise.

¹ As we reported in detail in the preceding literature review, we chose this method because the disclosure of tax returns is not allowed under tax and other provisions.

² As far as we know, this specific variable is not included in the electronic Databases of the Athens Stock Exchange (<http://www.helix.gr/web/guest/products>) or of ICAPDATA.

- *Ownconc*: ownership concentration; it is measured as the cumulative percentage of shareholders holding more than 5% per shareholder.

3.3.4. Control variables

The model includes various control variables adopted from the relevant literature to investigate the existence of other factors that affect corporate tax avoidance and thus achieve the best possible adjustment of the model. The model control variables were used in previous studies and it was found that there is a strong correlation between these variables and business tax avoidance. These variables are as follows:

- *Firmsize*: as size, we define the logarithm of the total assets of each company. The literature review revealed that the size of an enterprise is associated with corporate tax avoidance. Chen et al. (2010) and Richardson et al. (2013) concluded that larger companies are more involved in tax avoidance activities than smaller businesses, while Plesko (2003) and Noor et al. (2010) found a negative correlation between company size and tax avoidance. Although we cannot foresee how the size of Greek businesses affects tax avoidance, we will include this variable in our model, as in previous surveys it has been found to shape corporate tax avoidance.

- *Roce*: Return on Capital Employed. The *Roce* is best suited as a measure of corporate profitability in times of crisis that high borrowing rates and high finance costs are prevalent because it uses the EBIT in the numerator instead of pre-tax net earnings, and total assets minus short-term liabilities in the denominator. Lanis and Richardson (2012), Minnick and Noga (2010), Rego (2003) and McGuire et al. (2012) report a positive correlation between business profitability and tax aggression, while Gupta and Newberry (1997) suggest a negative correlation between business profitability and tax avoidance. Although the literature provides controversial results, this profitability measure will be included in the model, as it has a clear impact on corporate tax avoidance.

- *Debttoequity*: leverage, which is calculated as the ratio of long-term debt to equity. Several studies have concluded that there is a correlation between leverage and tax aggression, as those by Gupta and Newberry (1997), Chen et al. (2010), Dyreng et al. (2010), Armstrong et al. (2012). Previous research had resulted in different results, with some studies finding negative correlation and others finding a positive correlation.

- *Liquidity*: it is calculated from the quotient of current assets to total short-term liabilities. The liquidity of an enterprise may be a determinant of the effective tax rate. According to Vintila et al. (2017), profit-making enterprises have a lot of liquidity, which ensures strong partnerships with

audit firms to reduce the tax burden. On the other hand, high liquidity leads to a reduction of bank lending and, thus, reduction of interest expenses with a direct impact on the tax burden and effective tax rate, as tax rebates are limited.

- e_{it} : the error term in the regression.

3.3.5. Research constraints and assumptions

A more significant limitation of the present empirical analysis is the use of indirect and approximate technical measures to assess the avoidance of corporate taxation. Additionally, because tax return data is not available, we will only use data from the published financial statements of the businesses to be examined. Plesko (2003) and Hanlon and Heitzman (2010) questioned and criticized the accuracy of the financial statements on which tax evasion measures were based. The reason for their view is that this measure does not fully reflect the entire tax avoidance and, according to Hanlon and Heitzman (2010), fails to capture part of possible tax evasion activities. In addition, the annual tax rate measures are year-to-year volatility-sensitive (Dyreng et al., 2008).

Some assumptions have been taken into account in the *CETR* calculation. In particular, following Gupta and Newberry (1997), who limited the representative tax avoidance measures to between 0% and 100% in order to exclude their irrational figures and focus on fixed years in which tax evasion would be more likely, as in a year with profits, the following assumptions were made:

- If the pre-tax result is a loss and at the same time there is a tax payment, then *CETR* gets the maximum value (100%).
- If the pre-tax result is a loss and at the same time there is a tax refund, then *CETR* gets the value (0%),
- The independent *CETR* variable ranges between 0% and 100%.
- The main reason for eliminating certain values is to increase the quality of the data of the selected sample.

4. RESULTS

The statistical analysis of the data collected was performed with the help of STATA software. We performed a statistical analysis in the linear regression equation with the random effects model, as it is better for our samples than the fixed effects model.

4.1. Descriptive statistics

The following table illustrates the summarized descriptive statistics of the regression variables.

Table 1. Descriptive statistics

Variable	Obs	Mean	StdDeviation	Minimum	Maximum
<i>CETR</i>	280	0.3896797	0.4268508	0	1
<i>Firmsize</i>	280	4.42e+08	1.22e+09	1867377	7.76e+09
<i>Roce</i>	280	0.4395357	17.26474	-131.01	95.96
<i>Debttoequity</i>	280	1.562357	6.965699	-77.01	66.56
<i>Liquidity</i>	280	2.151571	3.55472	0.02	38.6
<i>Boardindep</i>	277	0.3070851	0.103432	0.02	0.7272727
<i>Ownconc</i>	280	0.6783172	0.1431351	0.3313	0.9388

The descriptive statistics present the total fluctuations of the above variables. The average cash effective tax rate is 38.96%, higher than the established tax rate.

On average, the independent directors cover 30% of the board of directors, which means that the composition of the boards of directors is at least satisfactorily covered by independent directors. The shareholding of 5% of companies' equity is on

average at 67%, so we have companies with a high concentration of capital, as in family firms.

For the other control variables (*Roce*, *Liquidity*, *Debttoequity*, and *Firmsize*), the average is 0.4395357, 2.151571, 1.562357 and 4.42, respectively.

Table 2 that follows illustrates a significant correlation between the dependent and the independent variables:

Table 2. Correlation matrix

Variable	<i>CETR</i>	<i>Firmsize</i>	<i>Roce</i>	<i>Debttoequity</i>	<i>Liquidity</i>	<i>Boardindep</i>	<i>Ownconc</i>	<i>Audittype</i>
<i>CETR</i>	1.0000							
<i>Firmsize</i>	0.0919	1.0000						
<i>Roce</i>	-0.0819	0.0386	1.0000					
<i>Debttoequity</i>	0.0064	0.0280	-0.3079*	1.0000				
<i>Liquidity</i>	0.0228	-0.0738	0.0072	-0.0530	1.0000			
<i>Board indep</i>	0.0453	-0.2159*	-0.0174	0.0736	-0.0581	1.0000		
<i>Ownconc</i>	-0.0766	-0.1422*	-0.0374	0.0050	0.0736	-0.0885	1.0000	
<i>Audittype</i>	0.1432*	0.4559*	0.0600	0.0191	-0.0209	-0.1147	0.0228	1.0000

Note: * Correlation is significant at the level of 0.05.

Table 2 shows a low linear correlation, statistically significant at a statistical significance level of 0.05 between *CETR* and *Audittype*, *Firmsize* and *Ownconc*, *Firmsize* and *Audittype*, *Firmsize*, and *Boardindep*, *Roce* and *Debttoequity*.

4.2. Empirical results

Regression results (see Table 3) will provide us with the necessary information to reject or accept our research hypotheses.

The econometric model used is that of random effects with time effects. The total regression adjustment (F) shows statistical significance

($\text{Prob} > \chi^2 = 0.006$), and the variables used to interpret a statistically significant portion of the variability of the dependent *CETR* variable.

From the results of the regression, a statistically significant correlation between *CETR* and size of the company (*Firmsize*) is found, as well as with the profitability of capital employed (*Roce*), moving in the opposite (negative) direction, though. The other variables in the model are not statistically significant when interpreting tax evasion, measured by the *CETR* ratio, leading to the rejection of the hypotheses with regard to *Ownconc*, *Audittype*, and *Boardindep* variables.

Table 3. Regression results

Numbers of obs	= 277	LR $\chi^2(11)$	= 26.16		
Numbers of groups	= 56	Prob > χ^2	= 0.0061		
<i>CETR</i>	Coefficients	Std. Err	P > z	[95% CONF. INTERVAL]	
				LOWER	UPPER
<i>Roce</i>	-0.031433	-0.0015619	0.044**	-0.00862046	-0.000082
<i>Firmsize</i>	0.0473476	0.0271529	0.081*	-0.0058712	0.1005664
<i>Debttoequity</i>	-0.0046118	0.0033535	0.169	-0.0111844	0.0019609
<i>Liquidity</i>	0.0015869,	0.0075476	0.833	-0.0132061	0.0163799
<i>Ownconc</i>	-0.1980955	0.2412407	0.412	-0.6709186	0.2747276
<i>Audittype</i>	0.0706366	0.091708	0.441	-0.1091077	0.2503809
<i>Boardindep</i>	0.22115	0.3270868	0.449	-0.4199284	0.8622284
Year					
2012	-0.1237067	0.0654131	0.059*	-0.2519139	0.0045006
2013	-0.1163492	0.0656281	0.076*	-0.244978	0.0122795
2014	-0.1030943	0.065747	0.117	-0.231956	0.0257674
2015	-0.2526283	0.0658815	0.000***	-0.31817536	-0.123503
Cons	-0.3155289	0.5852682	0.590	-1.462241	0.8311837

Note: *** significance level 1%, ** significance level 5%, * significance level 10%.

The tax avoidance of Greek companies does not, therefore, seem to be significantly influenced by the concentration of share capital among key shareholders, the number of independent members on the board of directors, and whether the company is audited by the internationally renowned audit firms (Big4). From the values of the variable "Year", it is shown that "time" (except for the period 2014) is correlated in a statistically significant way but negatively with *CETR* ratio (decreasing ratio), indicating its increase.

5. CONCLUSION

This research uses the *CETR* as a tax avoidance measure for listed companies in the Athens Stock Exchange. In order to control the possible relationship between corporate characteristics and corporate tax avoidance, we used as variables the size of the company, leverage, profitability of the capital employed, the independence of board members, liquidity, the type of audit firm and concentration in ownership of the share capital. The analysis was based on a sample of 56 listed companies and includes data for the period 2011-2015.

The empirical analysis shows a significant and positive relationship of *CETR* with the size of the company, which shows a lower level of tax evasion for larger companies and is consistent with Plesko (2003) and Noor et al. (2010), and a statistically significant negative relationship of *CETR* with profitability, as also shown in the studies of Lanis and Richardson (2012), Minnick and Noga (2010), Rego (2003) and McGuire et al. (2012), which indicate a higher level of tax avoidance for high profitability businesses. For the other variables, there is no significant statistical relationship.

Research findings on the relation between corporate tax avoidance/tax evasion, both with external factors and with endogenous corporate characteristics and sectoral variations, can be a useful tool and can be used in the formulation of the tax strategy. The implementation of appropriate tax policies could address tax avoidance and improve

the performance of the tax administration, particularly in times of economic hardship, where combating tax evasion may prove to be vital for effective crisis management.

We acknowledge that the present study does have limitations. Our results only indicate that Greek large-sized companies show less tax avoidance. It could be interesting to look at whether gender diversity affects tax policy. Moreover, this study only focuses on a small sample of Greek listed companies, thus, a larger sample might enhance the robustness of the results. Additionally, different measures related to tax avoidance could help to identify sectoral and non-sectoral features related to tax evasion. Last but not least, this study is country specific; therefore, an extension to similar countries with common corporate governance systems may help the comparability and generalization of the results.

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