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The impact of board diversity on tax aggressiveness: Evidence from Greece

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Abstract

The principal aim of this dissertation is to examine the influence of board of directors' diversity on corporate tax aggressiveness. I thorough investigation was made on the influence of board diversity on tax aggressiveness and also, on tax aggressive measures in recent prior literature. Based on a sample of 112 Greek companies covering the 2014-2018 period (560 firm year observation). My Ordinary Least Square results represented a significant and negative association between the proportion of women that served in the firm's board each year and the tax aggressive measures. This result was consistent with both measure of tax aggressiveness which were included in the models.

Key words

Board diversity, board gender diversity, tax aggressiveness, tax avoidance, GAS, corporate tax aggressive policy

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1. Introduction

An increasing divergence has been developed between the tax rules and the accounting rules, which companies adopt in order to conduct their financial statements. Tax aggressiveness has become of increasing concern to the Greek tax authorities the past years as tax collection is the main source of revenue of the Greek State. According to the respective Annual Reports of Bank of Greece, the tax revenue from legal entities had many fluctuations the past years. As can be seen from the graph, tax revenue started to increase steadily between 2013 and 2017, from about 1681 million euros to 3969 million euros (see Appendix 3 Graph 1). After that, tax revenue fell to 3471 million euros, which was a small decrease compare to the previous years and then, rose to 3680 million in 2018. Considering the fact that the corporate tax rate of the legal entities that keep a double entry accounting system was increased to 29% (4334/2015 law) in 2015 for three consecutive years, and then, it was decreased to 28%, in 2018 (see Appendix 3 Graph 2), probably indicates the beginning of a more balanced relationship between the Greek government and the Greek firms.

Governments, though impact board of directors' decision through tax enforcement (Desai, Dyck, & Zingales, 2007). To increase the revenue from tax payments, Government might impose laws that increase corporate tax rates and withholding tax rates or alter tax return policies, deductibility and exempt income criteria. The Board of Directors usually contradicts to these policies through the engagement in aggressive tax planning strategies in order to avoid paying taxes. There are strong evidence which prove that tax aggressiveness and tax avoidance are significantly related to corporate governance(Armstrong, Blouin, Jagolinzer, & Larcker, 2015; Lanis & Richardson, 2011). This motivated me to search about the specific characteristics of corporate governance that might influence corporate policies and especially, corporate tax policies. Boardroom diversity has a broad definition of possible determinants, e.g. gender diversity, independence, nationality, age and education. Following prior literature, there is evidence that the personal traits of women who serve on the board of directors influence corporate tax policies(Lanis, Richardson, & Taylor, 2017a). Women are by nature more risk averse than men when facing a risky situation(Adams & Ferreira, 2009a) such as the adoption of an aggressive corporate tax policy (Gupta, Mortal, Chakrabarty, Guo, & Turban, 2019).

The increasing presence of women in upper positions of the corporations (Gupta et al., 2019), motivated me to investigate the influence of women on tax aggressiveness when they serve on the board of directors. I made a small investigation on the female directors who served on the board in 2018 in Greek companies. I concentrated on companies which have their headquarters in Greece and they traded in the securities market in the Athens Stock Exchange (ASE). According to the annual reports of 151 Greek companies listed in ASE in 2018, 57,62% of the companies include at least one women on the company's board of directors. At first glance, this is a sign of tokenism, which means that women stand in the board of directors as symbols(tokens). In 2014, 62% of Europe companies had at least one woman in the Board of Directors, while in a research that was made in US the percentage reached up to 65%(Adams & Ferreira, 2009a). Then, I broaden my research from 2014 to 2018 and I extracted information from 112 Greek companies in ASE (see Data Sample), the percentage of women serving on the board rose from 53,57% to 58,93%.

I hypothesized in this dissertation that female directors should be less risk averse than male directors in order to adopt less aggressive corporate tax policies. Based on sample of 112 Greek companies listed in the Athens Stock Exchange, my ordinary least square regression indicates that there is a negative and statistical significant relation between women's presence on board and tax aggressiveness. This results are consistent across two of the most popular measure that were used in high rated journals in the last five years.

This dissertation contributes to literature in several ways. First, there are few studies that investigate the effect of gender diversity on tax aggressiveness. My results contribute to an understanding of the determinants of the directors' behavior on tax aggressive issues and mostly, on the risk preferences between men and women. Second, the topic is concurrent, because I investigate the boardroom gender diversity effect on tax aggressiveness. Third, I use a sample of Greek companies contributing to a better understanding of gender diversity in Greece. Gender issue has been of increasing concern across Europe and US the last few years, and there were countries such as Norway, who have gender quotas on board of directors. In Greece this issue is not further developed and this dissertation contributes to the solving of potential future questions and misunderstandings on boardroom diversity and tax aggressive issues. Fourth, a wide range of control variables is used in order to better analyze the determinants of boardroom diversity.

The remainder of this dissertation is organized as follows. First, it is the section of Theory & Empirical Studies, which has four subsections. The first subsections are the "the effects' of directors' attributes on the adoption of corporate tax policies" where I represent the respective theories and other articles that empirically proved those theories generally and then I specify my theories on the second subsection which is "The role of gender diversity in the directors' attributes that affect corporate tax policies". The third subsection is the "Factors that diminish the power of directors and affect the corporate tax policies". The fourth subsection is the "Institutional framework: Greece", where I represent the institutions that exist in the Greek market. Second, it is the section of "Empirical research on tax aggressiveness/avoidance", where I made a small research in recent articles published in high rated journals and I represents the advantages and the disadvantages of the most popular tax aggressive/avoidance measures. Third, it is the section of "Gender differences in Tax aggressiveness: Hypothesis development" where I represent what other studies empirically proved for this issue in specific and I am making my hypothesis. Fourth, it is the research design which is separated into four subsections. The first subsection is the "data and Hand-collection", in which a describe the extraction of the data procedure. The second subsection is the "Dependent variable". The third subsection is the "Independent variable". The Fourth subsection is the "Control Variables" and the fifth subsection is the Regression Model, in which I analyze the regression methods. Then, it is the "Empirical results and Analysis" which is separated into "Descriptive Statistics", "Correlation Matrix" and "Results". Finally, there the "Conclutions", "references" and "Appendices".

2. Theory & Empirical Studies

2.1 The effect of directors' attributes on the adoption of corporate tax policies

Management and control is separated in almost all multinational and listed companies. This phenomenon created a conflict of interest between the top executives and the shareholders

(agency problem). Instead of the agency theory which explicitly refers to the management act as principal (Kovermann & Velte, 2019), stakeholder theory includes all the stakeholder of the firm, in order to interpret the adopted corporate policies. Local community is a stakeholder which gives some privileges to the corporate and expect, in exchange, qualifying leads for community's life quality (Hill & Jones, 1992). A way of supporting governments to improve social welfare is the payment of corporate taxes, in which outside directors are more interested in (Lanis & Richardson, 2018).

IRC has defined the board of directors as a significant determinant of corporate tax policy (Lanis & Richardson, 2018). Upper Echelon theory aligns with statement supporting the argument that top executives due to their position in the firm are enabled to determine the corporate strategic formation and enactment (Gupta et al., 2019). Giving a clearer view on this association, according to the "tone at the top" theory, top executives affect the corporate tax policies through the provision of incentives to tax directors and affecting the resources allocation as far as the advisors' recruitment in different departments is concerned (Dyreng, Hanlon, & Maydew, 2010). The objectives that motivate the directors to be aggressive are the managerial opportunism and self-serving objectives(Chung, Goh, Lee, & Shevlin, 2019).

As it comes to the empirical studies concerning the existence of relation between the board of directors and the corporate tax policies, corporate governance is sensitive to the fluctuation of tax rates, where the corporate governance 'quality' is the determinant of the type of corporate response to these fluctuations (Desai et al., 2007). The quality of governance determines the level which executive exploit the corporates' opacity deriving from tax aggressiveness in order to profit from inside trading (Chung et al., 2019). The type of management is separated into Defenders, Prospectors and Analyzers. Prospectors who embrace uncertainty and innovation (more R&D expenditures), are more tax aggressive than Defenders and Analyzers(Higgins, Omer, & Phillips, 2015). Aligning with these outcomes, the companies with higher R&D expense have lowest potential to pay taxes (Guenther, Wilson, & Wu, 2018).

2.2 The role of gender diversity in the directors' attributes that affect corporate tax policies.

Under the managerial discretion theory, when the board of directors is challenged by low analyst coverage quality and low levels of institutional ownership, adopts more aggressive corporate tax policies(Gupta et al., 2019). Thereafter, the type of management's strategy determines their behavior. Directors who avoid innovative strategies, Defenders, tend to engage in less risky policies (Higgins et al., 2015). The risk preference is a main determinant of the policy enactment and it is innately determined by gender (Adhikari, Agrawal, & Malm, 2019). A problem that female directors face these days is the sign of tokenism, their symbolic position in the corporation. In order to make a theoretical review more approachable to gender appeal in the boardroom, critical mass theory infers to a critical threshold which represents the number of women needed so as to be heard on the boardroom minutes (Torchia, Calabrò, & Huse, 2011). Moreover, education, experience and skills are concerned as human capital of directors which, under the Human Capital theory, may contribute to the corporation (Carter, D'Souza, Simkins, & Simpson, 2010).

The risk preference is a key determinant of the corporate policies. Several studies empirically proved that woman are more risk averse than men. The gender difference is considered as a

trait, a particular type of behavior which is persistent across time and situations (Powell & Ansic, 1997). In more recent literature, it is supported that men and women differ in some psycho-social characteristics such as ethical and risk taking which may affect their decision when they take top-executives' positions (Gupta et al., 2019). Moreover, there is also the rationale that women tend to be more risk averse and conservative to their decision making (Adhikari et al., 2019; Lanis et al., 2017a). These attributes are extended, women are characterized as less overconfident and hubris as far as their abilities are concerned (Adhikari et al., 2019; Kovermann & Velte, 2019). Despite these, women are also considered trustworthy and more compliant with rules and regulations contributing to the empirical result that woman are less tax aggressive than men (Lanis et al., 2017a). While, men tend to adopt riskier policies and engage in more unethical strategies, women when are in top management positions, are associated with lower operating lawsuits and thus, engage in safer corporate policies (Adhikari et al., 2019; Gupta et al., 2019). Finally, men are 30% more likely to have attendance problems than women (Adams & Ferreira, 2009a). The point at issue though, it is what is best for the shareholders' value and the corporate financial performance and thus, it is mandatory to mention some inconsistencies in the empirical research about gender differences. Women are considered to be tougher monitors and engage in less aggressive tax policies (Adams & Ferreira, 2009a; Lanis et al., 2017a). However, excessive monitoring may be counterproductive and thus, affect negatively shareholders' value (Adams & Ferreira, 2009a). Contributing to this phenomenon, the avoidance of aggressive R&D policies, when women are in top management positions, is translated to lower operating lawsuits and subsequently to a loss of 7% of firm valuation (Adhikari et al., 2019). At this point, it must be mentioned that the effect of women on financial performance is not clearly identified, since studies provide no assurance whether women are associated with higher financial indicators or the fact that most profitable firms are eligible to recruit more women in their board of directors (Brieger, Francoeur, Welzel, & Ben-Amar, 2019) . On the contrary, there empirical evidence that, a positive relation exists between the number of woman and ethnic minorities (sub-sample of the gender sample) in the board with ROA (Carter et al., 2010).

Women though have to confront with tokenism. The reason why women might be counterproductive derives from the pressure they confront with their distinction as tokens (Adams & Ferreira, 2009a). According to the aforementioned study, 62% of Europe companies had at least one woman in the Board (in 2014), while in their US data sample the percentage reached up to 65%. The sign of tokens is an old issue, where women hold significant position in the Board of Directors of large companies and though, are chosen to be members of board for the sake of image (Kesner, 1988). A possible explanation is met in most recent literature, it is proved that the board of directors need 'at least three women' in order for their decisions to distinguish and make an influence on the boardrooms' meetings (Torchia et al., 2011).

According to the empirical results in literature, gender and independence diversity may affect the corporate tax policy. Gender may affect the human capital of corporation and thus, minority in the board have distinguished characteristic as far as the education, experience and skills are concerned (Carter et al., 2010). The educational background though, do not explain the tax aggressiveness' variations. If the financial knowledge of the boardroom is low, the corporate tax policy may be aggressive because of the "tone at the top" effect (Dyreng et al., 2010). As far as the percentage of executives is concerned, outside directors are less tax aggressive due to their interest in social welfare (Lanis & Richardson,

2018). However, individual executives differ in propensity toward tax avoidance policies (Dyreng et al., 2010).

2.3 Factors that diminish the power of directors and affect the corporate tax policies

Under some circumstances the objectives of tax aggressiveness are diminished by strong analyst coverage, institutional ownership and governments' instruments. As inferred to the agency theory, the management acts as an agent of the shareholders which means that they are accountable for their actions to their shareholders in the fear of losing their job (Kovermann & Velte, 2019). According to the managerial discretion theory, the power of Directors (Upper Echelon) is diminished when analyst coverage and institutional ownership is in in a high level (Gupta et al., 2019). Analyst coverage enhances corporate transparency, while the existence of blockholders strengthens the position of shareholders (Shleifer & Vishny, 1986). Therefore, according to theory, there are some governance mechanism which may reverse the impact of Board of Directors' characteristics on the decision-making. Despite of these two governance mechanisms, at the stakeholder level, the local governments may affect the corporate tax policy through the fluctuations of the tax rates, the relation between insiders and outsiders (corporate governance) and therefore, the corporate tax policies (Desai et al., 2007).

Empirical studies have proved that the impact of Board of Directors' characteristics on their decision is not always dominant, under some circumstances directors are confront with external pressure. The power of Directors (Upper Echelon) is dominant when analyst coverage and institutional ownership is in a low level (Gupta et al., 2019). Directors are less aggressive, especially when top executives are subjected to scrutiny by analyst coverage (Balakrishnan, Blouin, & Guay, 2018; Gupta et al., 2019). Moreover, empirical studies emphasizing on the magnitude of analyst coverage prove that information asymmetry and corporate transparency is negatively related to tax aggressiveness (Balakrishnan et al., 2018; Chen & Lin, 2017). In response of the aforementioned theory about the effect of the governments' influence, empirical studies have reached to the conclusion that firms which experience some pressure on their transparency, moderate the adoption of tax aggressive policies which occurred with the introduction of FIN 48 (Chung et al., 2019) or the delivery of the SEC (Kubick, Lynch, Mayberry, & Omer, 2016).

2.4 Institutional framework (Greece)

According to the annual report of Bank of Greece, the corporate income tax has been increased since 2017 due to businesses' profitability increase. Despite the economy improvement, there is a significant reduction to the public investments which is not followed by a respective increase in the private sectors' investment. This fact raises some uncertainty about the prospect of business development and therefore, the increase of income from corporate taxes. As far as the tax controls are concerned, the companies are obliged to two types of tax control. First, there are subjected to tax compliance audit by a statutory auditor who optionally, issues the relevant Tax Compliance Certificate (article 82 of the Law 2238/1994; article 65A of the Law 4174/13). Second, the companies are subject to tax audit by the respective tax authorities regardless of the Tax Compliance Certificate issuance (Circular 1006/05.01.2016) indicating the magnitude of tax authorities' involvement in the final determination act. Moreover, under the Gas Law (4308/2014), public interest

companies and financial institutions, which are the most companies in the sample under scrutiny, are subjected to IFRS.

The Athens Stock Exchange (ASE) includes 190 Greek Companies which contribute to the revenues of the Government through the payment of the corporate income tax. The Greek financial system is "relation-based' or insider system which has as a consequence the impact of insiders and their families on the corporate governance (Sikalidis & Leventis, 2017). The managerial opportunism and self-serving objectives that insiders may possess might lead to the adoption of an aggressive tax corporate policy (Chung et al., 2019). Under this point of view, insiders are better informed than the other stakeholders and they might profiteer from the information asymmetry.

The Greek government has taken into consideration the large magnitude of the executives on society's issues, and subsequently, on tax avoidance (Dyreng et al., 2010). In order to minimize the effect of executive and insiders, Greek Government imposed laws that determine the number of non –executive and independent non-executive directors in order to protect the shareholders' rights, especially the minorities of them. According to the Greek law, the number of non-executive members has not to be less than the one third (1/3) of the total number of the boardroom members. Had the boardroom have representatives of the shareholders' minorities, the entity is not obliged to have two (2) independent non-executive members between the non-executive members (art. 3 par.1 of L. 3016/2002). Moreover, in order to encourage the stability of the Greek banking system, the Hellenic Financial Stability Fund has a representative in Banks' boardroom (Art 10 par 2 of l. 3864/2010), which is irrelevant with the representative of the Greek Government of L. 3723/2008 (Art 10 par 2 of l. 3864/2010). In less words, there are two types of representatives in the banks. This is an issue that has already triggered the attention of other investigators and authors who proved that the existence of representatives in the banks' boardroom reduces the corporate tax aggressiveness.

3. Empirical research on tax aggressiveness/avoidance

Tax avoidance and tax aggressiveness are two terms that captured the attention of many authors who have strived to appropriately delineate their definitions let alone find measures without any restrictions. Not least among the difficulties in calculating a tax aggressive measure is the fact that an activity is recognized as illegal or legal after the tax control from the local tax authorities (Balakrishnan et al., 2018; Hanlon & Heitzman, 2010). Despite these limitations, a small research of mine on tax aggressiveness and tax avoidance measures resulted in some basic residuals and ratios that were identically used or processed further in order to identify and address the weaknesses of the measures. The sample was based on thirty-seven (37) articles (see Appendix 3 Chart 1) which included in their title the keyword of "tax avoidance" or "tax planning" or "tax aggressiveness" in the past five years (from 2014 till the August of 2019). The articles were retained from seven (7) four-star and three-star journals listed in "Accounting" subsection of the Academic Journal Guide published by the Chartered Association of Business Schools ("ABS Guide").

The measures that were mostly used during this period in the journals under scrutiny are the GAAP ETR and the Cash ETR. The ETR is the total tax expense scaled by pre-tax book income, commonly named in the literature as GAAP ETR, which companies are

obliged to disclose in the financial statements. The annual calculation of this ratio is the main disadvantage because it excludes the year-to-year variation (Balakrishnan et al., 2018; Dyreng, Hanlon, & Maydew, 2008). This obstacle is overwhelmed by using as a nominator the sum of total tax expense the past three years and also, the sum of pre-tax book income the past three years. Despite the year-to-year variation, the nominator (total tax expense) is the sum of current and deferral tax. A possible reduction of the current tax may lead to the increase of deferral tax. The inverse relation of the nominators' components may lead to the same rates of total tax expenses even though the companies adopt different tax planning strategies (Dyreng et al., 2008). Another weakness of this ratio which is similar to the Cash ETR is that it does not take into consideration the tax credits. For example, companies that have higher R&D expenses have more tax credits and thus, possess lower ETR rates than those that belong to other sectors (Balakrishnan et al., 2018). In order to eliminate those weakness, current ETR was introduced which is the current tax expense scaled by pre-tax book income. The ratio though, led to spurious results due to the use of accrual based accounts (Dyreng et al., 2008; Hanlon & Heitzman, 2010). The accounts which are used in the calculation of GAAP ETR and current ETR derive from Income Statement which is accrual based (current tax is derived from the notes) creating a confusion over the real period that tax is avoided. To eliminate the accrual based accounts, the ETR ratio was evolved into Cash ETR (Dyreng et al., 2008), which is the most used ratio in this sample of thirty-seven (37) articles.

Cash ETR has a significant advantage over the GAAP ETR ratio which is its nominator. The nominator is the cash tax paid which is extracted from the information in the Cash Flow Statement so as not to be accrual based and capture the real time effect of tax avoidance or aggressiveness (Dyreng et al., 2008). Although this attribute is the main reason that is mostly used, there are some inconsistencies that existed and motivated the evolvement of the ratio especially as far as the denominator is concerned. First, book pre-tax income which is derived from the income statement and is used as denominator is accrual based creating inconsistences. Second, book pre-tax income is an account which can be affected by earnings management policies and not inclusively from tax planning purposes. The cash flows from operations used as a denominator is a more representative account than pre-tax book income in order to capture both conforming and non-conforming tax planning strategies and also, the economic activity (Hoopes, Mescall, & Pittman, 2012; McGuire, Wang, & Wilson, 2014). Finally, some studies support that the ratio should include some industry-matched attributes such as the deviation of GAAP ETR ratio from the firm's mean industry size GAAP ETR (Balakrishnan et al., 2018) and the replacement of total pre-tax book income with the lagged total assets variable in the assumption that similar sized firms adopt the same tax policies (Badertscher, Katz, Rego, & Wilson, 2019).

The second category of measures that is mostly used to capture tax aggressiveness and tax avoidance is the Book-Tax Difference (Hanlon & Heitzman, 2010). Book-tax difference derives from the difference between the firm's book income and the firm's taxable income (Desai & Dharmapala, 2006; Frank, Lynch, & Rego, 2009; Khan, Srinivasan, & Tan, 2016). The main weakness of this ratio is that the taxable income is not publicly available and thus, researchers derive information from financial statements so as to estimate taxable income. Book-tax difference can be distinguished into permanent book-tax differences, which is the sum of federal tax expense and foreign tax expense scaled by the statutory tax rate and the temporary book-tax differences, which are computed by the deferred tax expense scaled by statutory rate(Higgins et al., 2015; Hsu, Moore, & Neubaum,

2018). The repatriation of foreign income in multinational companies though, is an aspect of this measure that should carefully be taken into consideration in order to avoid any miscalculation due to tax returns (Brieger et al., 2019; Desai & Dharmapala, 2006). Due to some inconsistencies some authors regressed those ratios on items (such as nondiscretionary items) so as to exclude them from the dependent variables and used the residuals as the main tax aggressiveness or tax avoidance variable. The most popular measure is the discretionary permanent differences which is based on permanent differences (Frank et al., 2009). The main advantage of this model is that it excludes the non-discretionary items by regressing total permanent differences on nondiscretionary items (intangible assets, state taxes) which are not associated with aggressive tax planning. The exclusion of nondiscretionary items is more important than the exclusion of temporary differences which in accordance with pre-tax earnings create spurious results, because pre-tax income is also a measure of earnings management. Earnings management is an issue that, in prior literature, investigators made an effort to exclude from book-tax differences(Desai & Dharmapala, 2006). They actually regressed book-tax gap on total tax accruals in order to exclude earnings management's effect. The exclusion of non-discretionary items of model (Frank et al., 2009) was more used than the model in which earnings management is excluded (Desai & Dharmapala, 2006)and thus, I separated from book-tax difference column (see Appendix 3 Chart 1). The section of book-tax difference includes models such as the two aforementioned models about discretionary items and earnings management exclusion. In comparison with ETR variables, permanent book-tax difference capture not only actual permanent book-tax difference but also the effect of all ETR reconciliation items (Higgins et al., 2015).

The other two categories are the Unrecognized Tax Benefits and the tax shelter measures. UTB that are applicable with the introduction of FIN 48 are for a limited number of years and also, it is hard to apply in Greek industry since the companies are in accordance with IFRS and GAAS. The Greek market is small, which make it reasonable for big listed-firms (see Data & Hand collection) to have at least one subsidiary in a foreign country in order to expand its business activities. Tax shelter measures require multinational firms (Balakrishnan et al., 2018) in a broader definition (in the US market) making it difficult to apply this measure in the Greek firms and any further investigation is beyond of this dissertation's scope. Moreover, I will also represent an interesting ratio (LEE, LIM, Kanagaretnam, & Lobo, 2014) which is based on the difference between the taxes that the companies paid and the taxes that the companies should have paid. They multiplied the firm's pre-tax income with the base country statutory tax rate and they subtracted the firm's actual tax expense, scaled by total assets. The aforementioned studies present as the basic disadvantage of Effective Tax Rates (ETR) the inclusion of earnings before tax or book income. This measure calculates the tax had the book income equals tax income and subtracts the cash tax expense in order to take into consideration the missing revenue due to tax avoidance. This has as a result the reduction of the firm's income taxes from the amount that would have been charged at the base country's statutory tax rate. In case the ratio is negative, it could be considered as an earnings management ratio that is why it needs a careful sample collection excluding the firms' with negative earnings before income tax expenses. This measure is not suitable in the Greek industries' data because there are many companies with net loss and this might create confusion on the final results

4. Gender differences in Tax aggressiveness: Hypothesis development

The boardroom characteristics that interfere in the corporate governance are further investigated by many authors who delineated the possible adopted corporate policies under specific personal traits of directors in the boardroom. Independence, diligence and expertise are three factors that positively affect the decision of the board of directors as far as the decision about the audit fees is concerned. These characteristics enhance the board of directors' concern about reputation capital, legal liability and shareholder interest to an extent that influences the corporate policies they must adopt (Carcello, Hermanson, Neal, & Riley Jr, 2002). Moreover, the size of board of directors and audit committees constitutes a crucial factor in monitoring financial process (Anderson, Mansi, & Reeb, 2004). The issue in this dissertation is whether gender is more important than the other personal traits so as to constitute a major factor in the adoption of tax aggressive corporate policies.

Most studies support that women are more risk averse than men (Adams & Ferreira, 2009a; Adhikari et al., 2019) and thus, adopt less aggressive corporate policies(Francis, Hasan, Wu, & Yan, 2014; Lanis et al., 2017a). In prior research, this phenomenon has been interpreted by three possible explanations according to female personal traits following Francis et al. (2014). First, under uncertain circumstances, women are likely to be more nervous and fearful than men (Francis et al., 2014). Tax uncertainty and tax avoidance have been further investigated in previous studies, which rationalized the volume of aggressive policies by putting an emphasis on the stakeholder pressure to minimize tax avoidance in order to avoid reputational loss (Guenther et al., 2018). This empirical result in combination with the women's intense behavior facing an uncertain condition could be reasonably explain the adoption of prudent policies by women rather than men in order to avoid future lawsuits (Adhikari et al., 2019). Second, women lack confidence (Adams & Ferreira, 2009a; Lanis et al., 2017a) and thus, they are more conservative to riskier situations. Finally, men tend to interpret riskier situation as challenges rather than a potential threat to the firm's reputation or performance (Francis et al., 2014), which is reasonably connected with the empirical results that women who possess powerful position on a firm adopt policies that minimize litigation risk (Adhikari et al., 2019).

Riskiness is an attribute that most authors used to interpret female directors' behavior on boardroom meetings and it is widely mentioned in prior research (Francis et al., 2014; Gupta et al., 2019) and their appearance on boards sensitizes to sustainability issues (Adams & Ferreira, 2009a). Women's position to respective matters has proved on empirical research that gender diversity in the board of directors is positively related to the quality of CSR disclosure (Katmon, Mohamad, Norwani, & Al Farooque, 2019; Lanis & Richardson, 2018). All these factors have been enhancing the concerns about the board of directors' quality in prior years (Carcello et al., 2002). The quality issue though, has been developed in recent research studies, since managerial extraction plays a key role in the adoption of corporate tax policies (Chung et al., 2019). Moreover, female directors are tougher monitors and women are less likely to face attendance problems than men who serve on the board of directors. Attendance behavior is of major importance due to the fact that board meetings are the main avenue which directors extract the appropriate information in order to carry out their duties (Adams & Ferreira, 2009a).

Specifically, women are less aggressive as it comes to R&D or marketing policies (Adhikari et al., 2019), which is a characteristic of directors, who tend to follow more conservative polices (called Defenders) and thus, they prefer to adopt less tax aggressive policies (Higgins et al., 2015). Moreover, empirical results have showed that the presence of women in the board of directors is negatively associated with tax aggressiveness (Lanis et al., 2017a). Contributing to this notion, women in CFO position have less possibilities to adopt tax aggressive policies than men, while female CFOs are less likely to adopt different preference in the volume of tax aggressiveness, under less risky circumstances. Taking into consideration the aforementioned prior literature, I use the following hypothesis:

Hypothesis 1: All else being equal, female directors are less likely to adopt tax aggressive policies than male directors.

5. Research design

5.1 Sample & Hand collection

The data sample is consisted of companies which their headquarters are located in Greece and they are trading in the securities market in the Athens Stock Exchange from 2014 to 2018. However, there were enough difficulties in the collection of the data, since there is a lack in the variables of the directors' personal characteristics. Some personal characteristics, which are the average annual age of directors, the directors' nationality, their finance or tax expertise and the years that the director has served in the CEO position, are hard to find in the databases. Moreover, the sample consists of panel data, which requires the time variation of the variables included in the model. Since databases did not include the yearly variation of membership of the directors in the boardroom, the data were primarily constructed from the annual financial statement. I downloaded the annual reports of the companies from the respective intersection of the website of the Athens Stock Exchange and I recorded the board of directors' names from 2014 to 2018 for each company. Under this structure, I searched in the financial statements the directors' personal characteristics, in order to capture the yearly variation of the variables since the synthesis of the board of directors had change the period under scrutiny. Most of the firms' financial statements though, did not include some personal characteristics of the directors such as age, education and nationality. In order to fill in the gaps, I used Amadeus and Thompson databases or their linkedin profile so as to extract the relevant information with the aforementioned personal characteristics of the directors. Exhausting every option as it comes to the extraction of directors' personal data, my dataset consists of 112 Greek companies which have been member in the Athens Stock Exchange from 2014 to 2018.

Overall, the final data sample is consisted of 112 Greek Companies that were listed in the ASE from 2014 to 2018 which means that the data is panel. Moreover, I chose to use data from years 2014 to 2018 because this period appeared more stable to me. There are not wide income tax rates fluctuations compared to previous years and there was an upward in the tax revenues due to the increase of Greek firms' profitability (see Appendix 1).

5.2 Dependent variable: The measures of tax aggressiveness

The significant absence of some personal information about the members of board of directors in the both databases led to the exclusion of a great portion of the firms included in the sample. Consistent with prior researches(Higgins et al., 2015), I could remove the Greek Companies that had negative earnings before income taxes (EBIT) or missing cash taxes paid but I tried to find a more approachable tax aggressive measures in order not to exclude other companies from my sample. This is the reason why I selected a measure which concentrates on book-tax differences. This measure enables me to include companies with negative earnings before income taxes, because it is affected by the difference between earnings before income taxes and taxable income rather than the negative sign of P/L before taxes. After including a dependent variable without minimizing further my dataset, I selected GAAP ETR as the second measure and I excluded the values with negative book pre-tax income (see Appendix 1).

The first measure is an adjusted permanent book-tax difference ratio to the Greek legislation (PERMBTD), and thus, it is more suitable for the respective sample of the Greek companies. The concertation on the difference between book income and tax income gives the privilege to include companies with negative values because it is based on the difference rather than proportion of income tax expense to profits before tax. To be more specific, I will measure permanent book tax differences following prior literature (Higgins et al., 2015) with some adjustments because this ratio is applied under US tax legislation. Under US tax legislation there three types of income tax expense which are the state or local tax, the United States federal tax and the foreign tax or outside United States tax. While, under GAS, there is usually one type of income tax expense which means that there is only one income tax rate. Despite these differences, both legislation distinguish current tax and deferred tax which is the key element in order to predict book-tax differences since taxable income is not disclosed in the financial statements. The calculation of the taxable income cannot be used in the Greek industry data, because this measure is adjusted to the American tax systems which differs from the Greek one. More specifically, taxable income is calculated by grossing up the sum of federal tax expense and foreign tax expense by the statutory rate. The American system has three types of income taxes which are the state, the federal and the foreign tax which concerns the corporate revenues which derive from outside of the USA. The existence of these three different measures led ne to the adjustment of this ratio consistent with prior literature. This is the reason why I calculated the taxable income by grossing up the current tax expense by the statutory rate of the respective year in each data section, consistent with prior literature (Brieger et al., 2019). Then, I subtracted the taxable income from the earnings before tax and divided by the total assets as it is calculated in the original models. Moreover, this measure is more suitable according to the Greek industry data sample for this dissertation because it is not mandatory to exclude the companies that have negative earnings before income tax (EBIT). The main concern of this ratio is the permanent differences that derive from the difference between the book income (EBIT) and the taxable income. This means that the ratio is not biased to the profit loss of the companies and contributing to the avoidance of the exclusion of these firms and the further sample minimization. Moreover, in the calculation of taxable income, I used 26% as income tax rate in 2014 values for each company, 29% as income tax rate for three consecutive years from 2015 to 2017 and 28% as income tax rate in 2018.

Total book-tax differences are the sum of permanent differences and the temporary differences. According to GAS law, temporary differences are the differences that will be offset in the future which is the deferred tax. The main purpose of deferred tax is to offset

the permanent differences that result from book-tax differences. In order to calculate temporary differences, I use deferred tax scaled by the statutory rate. The Greek income tax rate has changed throughout the period under scrutiny and this is the reason why I use in every year the respective income tax rate that was applied in each period. This method is also used in the calculation of the taxable income which is the current tax income expense scaled by the statutory rate (Brieger et al., 2019) rather than the sum-up of deferred tax (Higgins et al., 2015). So, the ratio is the difference between total book-tax differences which is pre-tax book income minus taxable income, and the permanent differences scaled by total assets.

The second measure is the second most popular measure of the 37 articles under scrutiny after Cash ETR, which is the GAAP ETR (see Empirical Research on Tax aggressive/avoidance). GAAP ETR is the income tax paid scaled by earnings before income taxes and Cash ETR is the cash taxes paid, extracted from the cash flow statement scaled by earnings before taxes. As it is aforementioned GAAP ETR includes accrual based accounts which has as a consequence to be affected by earnings management. This is the main reason why many authors before were more in favor of Cash ETR, in order to exclude earnings management effects from the main ETR ratio. Other investigators preferred the cash flow from operating activities rather earnings before income taxes as a denominator in order to avoid the biases from the earnings management policies. However, the lack of personal information of the directors in the boardrooms which led to the exclusion of those companies and the significant sample minimization in combination with a significant amount of companies that had negative earning before management, is a factor that creates some biases to this ratio in this dissertation's sample. Following prior literature(Higgins et al., 2015), I excluded the values that had negative numerator and run the regression with missing values in the dependent variable which is a possible sign that the model is not a perfect fit.

5.3 Independent Variable

The independent variable is a measure of women's presence on the boards of the firms which were included in the sample. It is measured as the total women who served on the board in each year scaled by the total member of directors that served on the boardroom the respective year (see Appendix 1). The data was extracted from annual financial statements from 2014 to 2018 for each company and I count only the directors that served on the board until the end of the year (Closing date Financial Statements).

5.4 Control Variables

The selection of the control variables was based on two studies that separated the control variables into two broader categories which are the board-level controls and the firm-level controls(Adams & Ferreira, 2009b; Lanis, Richardson, & Taylor, 2017b). The board-level controls are variables that control for some board characteristics that might affect the volume of directors' aggressive decisions. Moreover, board-level controls include variables about characteristics of institutional ownership and audit companies, because institutional ownership and auditors might exert pressure on the directors' adopted policies. These variables are the average age of the directors, directors' financial or tax expertise, nationality, CEO years that the CEO has served on the respective position, the case where the duties of CEO and Chairman are combined, remuneration, blockholders who serve on the boardroom or they are external and the audit company (Lanis et al., 2017a). Firm-level controls are variables that take into consideration firm's profitability, leverage, liquidity, possession of inventories, market capitalization and companies size (see Appendix 1).

BIND variable is measured as the proportion of the independent members in the Board of Directors (independent non-executive members and non-executive members). The boardroom independence is a more developed determinant, in prior literature than female presence on boards. However, Greek law controls for independence issues since it has quotas on directors' independence as it is aforementioned (see Institutional framework of Greece). Moreover, the volume of riskiness of corporate policies may be affected by the age of the directors (AGEDIR), the proportion of the directors who are ethnically diverse (PETHDIVBOD) and the financial expertise that may earn through college or job experience (FINTAXEXP). In this point, I have to mention that FINTAXEXP is the proportion of the directors which I studied in their resumes that have studied economics, accounting and finance. Since many directors had finished law school, I chose only the directors that had an expertise in tax issues and as it comes to the directors that have studied management I chose only those that had expertise in financial management or previous bank experience. Most of the directors had economic expertise rather than strictly finance as it is calculated in prior literature (Lanis et al., 2017a). Thus, this ratio is adjusted to the Greek data by adding directors with bachelors' degree in economics, expertise in taxation and bank experience. This is the reason why I cannot predict the sign of this control variable's coefficient.

CEOTENURE is a variable that indicates the years that the CEO has the respective position and the CEODUAL variable is a dummy variable equals 1 when the responsibilities of the chairman and the CEO are concentrated on the same person and 0, otherwise. Chief Executive officer's position is of tremendous significance and it has to be included in the model (Lanis et al., 2017a). MTOBOD controls for the proportion of the shares that are controlled by the directors who serve on the boardroom. I only took into consideration the directors that directly own more than 5% of the company's share. BLOCKHOLD control for the blockholders which do not participate in the board of directors. Closing the board-level control variables' category, I used the control variable BIG4AUD, which is a dummy variable that takes the value of 1 if the company has been audited by one of the Big 4 Audit firms (KPMG, Deloitte, PwC and EY). Before finishing the representation of the board-level control variable, I have to mention that I did not include a remuneration variable. Rem is measured as the total remuneration of directors and managers and controls for remuneration (Lanis et al., 2017a). I extract the total remuneration of directors in upper positions from the financial statements, but most companies disclose only the sum of directors' and managers' remuneration. This is the reason why I could not follow the exact ratio from literature and thus, I exclude the variable from the models I followed.

As far as the firm-level control variables' category is concerned, SIZE controls for size effects (measured as the natural logarithm of total assets). According to prior research, (Lanis & Richardson, 2018; Lanis et al., 2017b)the size of a firm is related to tax aggressiveness since it is proved that larger companies possess greater political power compare to smaller firms. This privilege might enable larger companies to minimize their tax burden and thus, to be more tax aggressive(Richardson & Lanis, 2007).

Following prior literature there are three basic avenues that may be used from multinational companies in order to avoid tax payment. Avoiding taxation may be achieved through the use of leverage, intangibles and tax heavens (Markle & Shackelford, 2011). LEV (measured as the long-term debt scaled by total assets) controls for the volume of the firm's leverage. The strategic use of leverage is concentrated mostly on the fact that interest is tax deductible. Highly leveraged companies are more tax aggressive. As it comes to intangibles, I focused my

research on intellectual property. According to the statistics only 15,34% of the companies had at least one trademark, 2,65% had at least one patent while only the 4,76% of the companies possessed both in 2019. Despite the tax privileges that firms with patents have, I excluded intellectual property due to the low rates of the variable. According to the existence of subsidiaries in a foreign country, the initial model controlled for this issue (Lanis et al., 2017a), which I excluded, because it will be biased in my dataset. Greek industry is small and thus, it is reasonable for a Greek big company to have subsidiaries in a foreign country in order to expand its business.

As far as profitability, growth rates and Cash equivalents are concerned, they are three variables that are included in tax aggressive models in prior literature. ROA (measured as the EBIT scaled by total assets) controls for the firm's profitability, while MKTBK (measured as the market value of equity scaled by the book value of equity) controls for the firm's growth rates. Following prior literature, the results obtained for these variables are contradicting. Growth firms though, are more likely to possess tax favored assets and become more tax aggressive. Moreover, CASH (measured as the cash holdings scaled by lagged total assets) control for the company's cash need and it is a variable that is used in tax aggressive models in prior literature(Lanis & Richardson, 2018).

5.5 Regression Model

The following regression model is based on Lanis et al. (2015) model and examines the relation between corporate tax aggressiveness and gender diversity in the 112 Greek companies included in the sample from 2014 to 2018.

$$
\begin{aligned}
PERMBTD = a_0 &+ \beta_1 pWOM + \beta_2 BIND + \beta_3 FINTAXEXP + \beta_4 AGEDIR \\
&+ \beta_5 PETHDIVBOD + \beta_6 CEOTENURE + \beta_7 CEODUAL \\
&+ \beta_8 MTOBOD + \beta_9 BLOCKHOLD + \beta_{10} BIG4AUD \\
&+ \beta_{11} SIZE + \beta_{12} ROA + \beta_{13} LEV + \beta_{14} MKTBK + \beta_{15} CASH \\
&+ \beta_{16-19} YEAR + \varepsilon_{it}
\end{aligned}
\tag{1}
$$

$$
\begin{aligned}
ETR = a_0 &+ \beta_1 pWOM + \beta_2 BIND + \beta_3 FINTAXEXP + \beta_4 AGEDIR \\
&+ \beta_5 PETHDIVBOD + \beta_6 CEOTENURE + \beta_7 CEODUAL \\
&+ \beta_8 MTOBOD + \beta_9 BLOCKHOLD + \beta_{10} BIG4AUD \\
&+ \beta_{11} SIZE + \beta_{12} ROA + \beta_{13} LEV + \beta_{14} MKTBK + \beta_{15} CASH \\
&+ \beta_{16-19} YEAR + \varepsilon_{it}
\end{aligned}
\tag{2}
$$

PERMBTD calculated as the difference between total book-tax differences and temporary book-tax differences, scaled by the total assets. Total book-tax difference is calculated as the difference between pre-tax book income and taxable income. Taxable income is calculated by grossing up current income tax expense which is disclosed in the notes of the financial statements. Temporary book-tax differences are the calculated by grossing up deferred tax expense by the income tax expense that was applied the respective year. ETR is total tax income tax expense scaled by the Earnings before taxes; pWOM is the independent variable and it is the proportion of women served on the board of directors scaled by the total

directors in the respective board each year; BIND is the proportion of directors that are independent non-executive and non-executive; FINTAXEXP is the proportion of directors who serve on board with financial or tax expertise; AGEDIR is the average age of the directors who served on the board; PETHDIVBOD is the proportion of directors that do not have Greek nationality; CEOTENURE is the years that the CEO has served in the CEO position; CEODUAL is a dummy variable, coded 1 if the duties of chairman and chief executive officer are concentrated on the same person, otherwise 0; MTOBOD is the total proportion of corporate stock owned by directors who serve on the board; BLOCKHOLD is the total proportion of ordinary shares capital of blockholders who hold at least 5% of the outstanding shares and do not serve on the board; BIG4AUD is a dummy variable, coded 1 if the audit firm is KPMG, PwC, E&Y or Deloitte, otherwise 0; SIZE is the natural logarithm of assets; ROA is the ratio of Income before taxes scaled by total assets; LEV is the ratio of longterm debt scaled by total assets; MKTBK is the ratio of the market value of equity divided by the book value of equity; CASH is the Cash and Cash equivalents from the annual statements scaled by total assets; and YEAR is a year dummy variable, coded 1 if the year falls within the specifice year category, otherwise 0; ε is the error term.

6. Empirical Results and Analysis

6.1 Descriptive Statistics

In this section, I analyze the descriptive statistics of the main variables, and also I used some metrics in order to analyze the probability distribution of the variables. I concentrated on the mean, standard deviation, the minimum, the maximum value, skewness and kurtosis. The descriptive statistics of the model's variables and the descriptive statistics of the two categories of the dependent variable are shown in Table 2(see Appendix 2):

[Insert Table 2 about here]

For the best analysis of the dependent value, I created two additional variables about the size of board of directors (bodsize) and the number of women that served on the board (WomenNumb) for each year from 2014 to 2018 for every company under scrutiny. These two variables are the components of Pwom, since it is the women served on the board (women) scaled by the size of board of directors (bodsize) in a specific year at a specific company. Taking into consideration the descriptive statistics and a wide a number of values close to 0 (P25=0), the distribution of Pwom at first glance can be considered as normal but skewed to the left. The skewness to the left is due to the numerator of the ratio, WomenNumb, because there is a lack in women in the Greek boardrooms which is translated to the skewness of the probability distribution to 0. However, pWOM is a more normalized than distribution of WomenNumb, because of the boardroom size effect which has as a consequence the standard deviation of pWOM to be lower (sd pWOM= 0,14 and sd WomenNumb= 1,05) and the kurtosis to be higher than WomenNumb's distribution(kurtosis pWOM= 4,02 and sd WomenNumb= 3,90) .

According to the descriptive statistics it can been seen that the board of directors' independence (BIND) and women's proportion on boardrooms (Pwom) is a result of the law enforcement relative to quotas on independence of the board issue in the Greek industry. To be more specific, the state has taken into consideration the need of law in the independence of boardrooms and thus, the probability distribution is more normalized, because companies' mean and second quartile are close enough (mean=0,639 and

p50=0,625). Probably if there was a law about women's presence on boards the distribution would not be skewed to zero. Moreover, the 56,8 average years of directors' age is a consequence of the relations that exist in the Greek system (see Institutional framework of Greece), since most of the older directors are the founders of the firms who most of the times are blockholders of the company. This close relation affects also CEOTENURE variable since most of the founders or owners of the company are also CEOs which explains the fact that a great deal of director in the sample, 50%, has been serving on the position of CEO for 9 to 42 years. The existence of high variance, though, is a consequence of the need of CEO who are more expert on finance or regal issues than the corporations' founders, since most of the firms hire experienced CEO in order to expand the volume of revenue or to keep up with the pace. Therefore, these fluctuations caused by the existence of the founders on boards and the need of young directors with new ideas creates high variance rates.

As it comes to the firm specific variables and MKTBK, p75= 0,76154 and max=41,5573. This indicates that the biggest part of market capitalization is concentrated on a few number of companies little companies have the greatest market capitalization. Following the lead, CASH variable has low rates, which indicates the lack in liquidity in the Greek market, while according to the 3ht quartile of LEV ratio, 64% of the companies (difference between p75=0,36 and max=1) are high leveraged by long-term debt. Moreover, negative values of roa were reasonable due to the sample selection and a great deal of companies included in the sample that had negative earnings before income taxes.

6.2 Correlation Matrix

In this section, I used Pearson pairwise correlation. The results are represented in two Panels. Panel A is the correlation matrix of the dependent variable of, permanent differences, PERMBTD, and Panel B is the correlation matrix of the dependent of Effective Tax Rates, ETR.

[Insert Table 3 about here]

Panel A indicates (see Appendix 2 Table 3 Panel A), the Pearson pairwise correlation results of Model 1. Significant negative correlations are found between the dependent variable PERMBTD and the independent variable Pwom. This result indicates the significant negative association of the women's presents on boards from the period of 2014 to 2018 in 112 Greek companies with corporate tax aggressiveness. Moreover, in the correlation matrix are included the board-level controls (BIND, PETHDIVBOD, FINTAXEXP, AGEDIR, CEOTENURE, CEODUAL, MTOBOD, BLOCKHOLD, BIG4AUD) and the firm-level controls (MKTBK, SIZE, ROA, LEV, CASH).

Panel B Table 2 indicates (see Appendix 2 Table 3 Panel B), the Pearson pairwise correlation results of Model 2. Negative correlations are found between the dependent variable ETR and the independent variable Pwom, but not significant. The lack of significance is expected, because the values of the dependent variable were minimized due to the exclusion of the companies that had negative earnings before income taxes. This result indicates the negative association of the women's presents on board from the period of 2014 to 2018 in 112 Greek companies with corporate tax aggressiveness. Despite the data minimization in the ETR ratio and the lack of significance of the independent variable, ETR ratio is interesting because it includes only the values of companies with positive earnings before interest are

excluded. Thus, it is easier to compare Model 1 with Model 2 in order to observe some differences between the reaction of female women on companies that had negative and positive earnings before interest (see Appendix 2 table 4) . Moreover, in the correlation matrix are included the board-level controls (BIND, PETHDIVBOD, FINTAXEXP, AGEDIR, CEOTENURE, CEODUAL, MTOBOD, BLOCKHOLD, BIG4AUD) and the firm-level controls (MKTBK, SIZE, ROA, LEV, CASH).

6.3 Results

I present my OLS regression results on board diversity and tax aggressiveness along with control variables shown in table 4 (see Appendix 2). Model (1), which is the main model of this dissertation, represents the pooled regression between permanent differences (PERMBTD), women's presence in boardroom (Pwom), board-level controls and the firm-level controls. In respect of women presence on boards, my results demonstrate that pfemdiv (coef= -0.0503, p<0,1) is positively related to tax aggressiveness and statistically significant. For board-level control variables, the signs were equal to the predicted ones, but there were not any statistical significant coefficients. On the contrary, ROA (coef= -0,00881 , p<0,01) is statistically significant and negatively related to the dependent and Cash (coef =0,0892 , p<0,05) is statistically significant and positively related to tax aggressiveness.

[Insert Table 4 about here]

In model 2, shown in Table 4 (see Appendix 2), I use ETR variable as the dependent variable. Model 2 represents the pooled regression between ETR, women's presence in boardroom (Pwom), board-level controls and the firm-level controls. R-squared dramatically dropped from 49.7% to 14,3% and some signs are not equal to the predicted ones. This is reasonable since we excluded the values of the firms that had loss before taxes. However, big4audit (coef=4,932 , p<0,05) is negatively and significantly related to tax aggressiveness indicating that companies who have profits when a big audit company exerts pressure on them are more prudent than those that had loses which are included in Model 1 and the coefficient is positive and insignificant.

Model 3 and 4, represent the pooled regression between the dependent, the independent variables and the board-level control variables. In Model 3, the tax aggressive measure is the permanent book tax differences and in Model 4, it is the ETR measure. Following, the first two models, Model 3 has a better fit than Model 4 due to the exception of companies with negative equity. In spite of the fact that the women's presence is negatively related to tax aggressiveness the signs in the other two models are different indicating the significance of firm-level controls. According to prior literature, risk preference is the main determinant of women's decision and thus, we should control for ratio that might indicate risky situations (e.g. high leverage rates, low profitability).

Finally, model 5 and model 6 represent the pooled regression between the dependent, the independent variables and the firm-level control variables. In Model 5, the tax aggressive measure is the permanent book tax differences and in Model 6, the dependent is the ETR ratio. These two models were regressed in order to realize the significance of the control variables. Model 5 is fits better than Model 3, but this does not happen in the case of Model 4 and Model 6 creating question about the women's opinion on boards when companies are profitable.

Overall, I excluded the remuneration and the inventory variable from the OLS regression Models, because they affected the significance of the independent variable (pWOM). This probably happened because I used the sum of directors' and managers and most variables that I used had a percentage from and numbers in euros. I was not able to extract information of the total performance-based remuneration in order to create the ratio used in prior literature(Lanis et al., 2017a). Moreover, I had to adjust my model to the 112 companies and the lack in inventories in a great deal of the companies caused some spurring on the sample so as to exclude the inventory variable as well.

7. Conclusions

This study investigates the influence of gender diversity of the Greek boards on tax aggressiveness. My pooled OLS regression results indicate a negative and statistical significant association between female presence on boards and corporate tax aggressive policies. According to my investigation, this result was from the regression of the model which included companies with negative earnings before profits, control variables for firm-level variables and board-level variables including independence of board of directors, education, age and nationality. In spite of the fact that the descriptive statistics presented a sign of tokenism due to the existence of many boards with zero women, the association was statistically significant which proves that women opinion matters on board's decision.

In order to improve my dissertations' analysis, two methods that I could use in order to make a better regression analysis would be the fixed-effect and the random effect model instead of a pooled regression. Despite of the fact that I include control variables for each year under scrutiny, I could create another variable which would control for the industry sector, since there are evidence that tax aggressiveness is affected by the fluctuations across the sectors. Moreover, as it is aforementioned, the distribution of the dependent value is skewed to the left, because of the lack in women in the Greek industry. Therefore, the existence of zero value to a great extent in the value of women's proportion on the Greek boards should be further tested in order to check for inconsistencies. Moreover, according to prior research, authors used two-Stage Heckman procedure so as to deal with endogeneity and it would also be better to conduct some heteroscedasticity tests in order to control for heteroscedasticity.

Future research on the effect of gender boardroom diversity on the adoption of corporate tax aggressive policies could be several issues. First, according to prior literature, there are evidence that women and men follow the same volume in aggressive policies when blockholders or analyst coverage exert pressure on them. Specifically, an investigation of the reaction of female directors serving on boards of Greek companies to the external pressure compare to the male directors serving on respective boards. Second, the use of a wider

period sample in order to investigated female directors' reactions on the fluctuation of the tax rates. Third, following the same notion, it would be interesting to create a sample which will include pre-crisis and crisis period in order to investigate boardroom diversity reaction to the change of economic circumstances. Fourth, future research could also study whether women presence on the Greek Boards enhance shareholders value or profitability returns. Since, women's presence on European boards is undergoing a revival of popularity, it would be a great contribution in the literature an article which will give a clear view of female directors' contribution to the Greek firms in order for the community to have gender quotas on Greek Boards. Fifth, a further research could be on the effectiveness of women as blockholders. Most of Greek companies, have as Chairman or CEOs the founders of the firms and family members or descendant of the founders. It would be interesting a research on whether women have a significant association with tax aggressiveness because of their family origins.

This study provides unique insights as far as the association of female directors who serve in the Greek boards and corporate tax aggressiveness is concerned. This issue has not been further developed in the Greek industry and, thus this dissertation helps to develop the literature regarding the link between women and tax aggressiveness in Greece. There is a wide range of control variables especially, regarding the board characteristics and therefore, board diversity. Moreover, my results have important implication, because it is an issue that rise in popularity and thus, enhance the magnitude of this matter which is the gender quotas on boards in the Greek industry.

Appendices

Appendix 1

Table 1:Variable definitions

Variables	Definition
Dependent Variable	
PERMBTD	the difference between total book-tax differences and temporary book-tax differences, scaled by the total assets. Total book-tax difference is calculated as the difference between pre-tax book income and taxable income. Taxable income is calculated by grossing up current income tax expense which is disclosed in the notes of the financial statements. Temporary book-tax differences are the calculated by grossing up deferred tax expense by the income tax expense that was applied the respective year.
ETR	Total tax expense scaled by profits before earnings
Indipendent Variable	
pWOM	proportion of women that served on the board of directors at a specific year in each company
Board control variables	
BIND	proportion of non-executive directors and independent non-executive directors that served on the board
FINTAXEXP	proportion of directors who serve on board with financial or tax expertise
AGEDIR	the average age of the directors who served on the board
PETHDIVBOD	the proporiton of directors that do not have Greek nationality
CEOTENURE	the years that the CEO has served in the CEO position
CEODUAL	A dummy variable, coded 1 if the duties of chairman and chief executive officer are concentrated on the same person, otherwise 0
MTOBOD	the total proportion of corporate stock owned by directors who serve on the board
BLOCKHOLD	the total proportion of ordinary shares capital of blockholders who hold at least 5% of the outstanding shares and do not serve on the board
BIG4AUD	A dummy variable, coded 1 if the audit firm is KPMG, PwC, E&Y or Deloitte, otherwise 0
Firm control variables	
SIZE	the natural logarithm of assets
ROA	Income bofore taxes scaled by total assets
LEV	longterm debt scaled by total assets
MKTBK	The market value of equity divided by the book value of equity
CASH	Cash and Cash equivalents scaled by total assets
YEAR	Year dummy variable, coded 1 if the year falls within the specifice year category, otherwise 0

Appendix 2
Table 2: Descriptive statistics

Panel A: Descriptive statistics for the depedent variable PERMBTD, 2018-2014

Variable	sd	mean	variance	max	min	kurtosis	skewness
2018	13,2	-1,2	173,8	5,3	-138,0	108,0	-10,3
2017	28,3	2,9	801,2	299,6	-2,8	111,7	10,6
2016	1,3	0,2	1,6	10,3	-2,0	47,0	6,5
2015	28,9	0,0	836,7	146,5	-254,4	60,6	-4,9
2014	13,8	0,1	191,6	64,6	-121,0	58,5	-5,0

Pancel B Descriptive statistics for the depdent variable ETR, 2018-2014

Variable	sd	mean	variance	max	min	kurtosis	skewness
2018	0,89	0,17	0,79	1,47	-6,07	38,65	-5,67
2017	0,87	0,28	0,75	5,55	-3,57	26,04	2,15
2016	3,97	0,84	15,75	32,60	-0,92	64,97	8,00
2015	7,21	1,68	51,97	52,50	-0,62	49,02	6,88
2014	0,83	0,45	0,69	4,80	-1,79	14,33	2,74

Panel C Descriptive statistics of the model variables, women presence and boardroom size

Variable	sd	mean	variance	max	min	p25	p50	p75	kurtosis	skewness
bodsize	2,59	8,12	6,72	21,00	4,00	6,00	7,00	9,00	4,18	1,10
women	1,05	0,91	1,10	5,00	0,00	0,00	1,00	1,00	3,90	1,16
pWOM	0,14	0,12	0,02	0,60	0,00	0,00	0,09	0,20	4,02	1,21
BIND	0,16	0,64	2,40	0,02	0,63	0,54	0,63	0,77	-0,20	0,20
PETHDIVBOD	0,17	0,10	0,03	0,88	0,00	0,00	0,00	0,14	8,78	2,31
FINTAXEXP	0,21	0,39	0,04	1,00	0,00	0,25	0,40	0,56	2,66	0,02
AGEDIR	6,34	56,85	40,18	81,44	36,00	53,33	57,00	61,25	3,63	-0,15
CEOTENURE	11,85	13,35	140,54	46,00	0,00	4,00	9,00	21,00	2,95	0,97
CEODUAL	0,49	0,42	0,24	1,00	0,00				1,12	0,34
MTOBOD	4,46	0,75	19,88	54,72	0,00	0,00	0,30	0,61	122,89	10,85
BLOCKHOLD	4,82	0,75	23,29	74,62	0,00	0,00	0,17	0,49	145,50	11,41
BIG4AUD	0,44	0,26	0,19	1,00	0,00				2,21	1,10
MKTBK	4,13	0,50	17,04	41,56	-70,26	0,11	0,41	0,76	96,13	-8,05
SIZE	0,98	5,26	0,96	9,60	3,26	4,53	5,02	5,80	3,85	1,00
CASH	0,10	0,09	0,01	0,89	0,00	0,02	0,05	0,13	12,83	2,52
ROA	7,76	0,01	60,29	18,99	-63,23	-2,42	0,56	3,91	13,47	-1,90
LEV	0,20	0,22	0,04	1,00	0,00	0,06	0,18	0,36	4,01	1,03

Where, BOD= sum of directors served on the board

Women= sum of female directors served on the board

pWOM proportion of women that served on the board of directors at a specific

	year in each company
BIND	proportion of non-executive directors and independent non-executive directors that served on the board
FINTAXEXP	proportion of directors who serve on board with financial or tax expertise
AGEDIR	the average age of the directors who served on the board
PETHDIVBOD	the propotiton of directors that do not have Greek nationality
CEOTENURE	the years that the CEO has served in the CEO position
CEODUAL	A dummy variable, coded 1 if the duties of chairman and chief executive officer are concentrated on the same person, otherwise 0
MTOBOD	the total proportion of corporate stock owned by directors who serve on the board
BLOCKHOLD	the total proportion of ordinary shares capital of blockholders who hold at least 5% of the outstanding share and do not serve on board
BIG4AUD	A dummy variable, coded 1 if the audit firm is KPMG, PwC, E&Y or Deloitte, otherwise 0
SIZE	the natural logarithm of assets
ROA	Income bofore taxes scaled by total assets
LEV	longterm debt scaled by total assets
MKTBK	The market value of equity divided by the book value of equity
CASH	Cash and Cash equivalents scaled by total assets

Table 3: Correlation Matrix

Panel A: Correlation Matrix of permanent differences

book	PERMBTD	pWOM	BIND	PETHDIVBOD	FINTAXEXP	AGEDIR	CEOTENURE	CEODUAL
PERMBTD	1							
pWOM	-0,0816*	1						
BIND	0,0747	-0,3054	1					
PETHDIVBOD	-0,1039	-0,0985	0,2695	1				
FINTAXEXP	-0,067	-0,0918	0,0931	0,1538	1			
AGEDIR	-0,0075	-0,0425	0,0626	0,0378	0,0781	1		
CEOTENURE	-0,0513	0,1984	-0,2303	-0,165	-0,0352	0,0951	1	
CEODUAL	0,0171**	0,1424	-0,043	-0,2604	-0,1349	-0,2144	0,3061	1
MTOBOD	0,0543	0,0633	-0,0494	-0,0606	0,0039	-0,0302	-0,0093	-0,0246
BLOCKHOLD	0,0268	-0,0406	-0,0613	0,0188	0,019	-0,0064	-0,0939	0,0382
BIG4AUD	-0,0262	-0,0901	0,2975	0,3254	0,2681	0,2665	-0,179	-0,193
SIZE	-0,1282	-0,1148	0,1941	0,2914	0,011	0,3689	-0,0984	-0,0674
MKTBK	-0,0231	0,0095	-0,0191	-0,0746	0,0185	-0,0055	0,0684	0,0388
ROA	-0,6829**	0,0174	-0,0722	0,132	0,1196	-0,0203	0,0224	0,0603
LEV	-0,0305	-0,1385	-0,1299	-0,0518	-0,094	0,062	0,1139	0,1885
CASH	-0,1438**	-0,0109	-0,0137	-0,0115	-0,0164	-0,0095	-0,0282	0,0234

*** p<0.01, ** p<0.05, * p<0.1

Panel A(continued in the next page): Correlation Matrix of permanent differences

MTOBOD	BLOCKHOLD	BIG4AUD	SIZE	MKTBK	ROA	LEV	CASH
1							
0,3282	1						
-0,0688	-0,0332	1					
-0,1561	-0,0681	0,5206	1				
0,0026	-0,0004	-0,0454	-0,0005	1			
-0,0787	-0,0853	0,1279	0,2206	0,0402	1		
-0,072	0,0357	0,0158	0,1586	-0,0173	0,0444	1	
-0,025	-0,0599	0,229	0,0582	0,0861	0,3551	-0,132	1

*** p<0.01, ** p<0.05, * p<0.1

Panel b: Correlation Matrix of ETR

	ETR	pWOM	BIND	PETHDIVBOD	FINTAXEXP	AGEDIR	CEOTENURE	CEODUAL
ETR	1							
pWOM	-0,1072	1						
BIND	0,156	-0,3027	1					
PETHDIVBOD	-0,0036	-0,1495	0,2745	1				
FINTAXEXP	0,0017	-0,0129	-0,0636	0,071	1			
AGEDIR	0,0865	-0,183	-0,0813	-0,0283	0,0984	1		
CEOTENURE	-0,085	0,0989	-0,2624	-0,2342	0,0218	0,0872	1	
CEODUAL	-0,1196	0,3001	0,0525	-0,2452	-0,1862	-0,1794	0,4555	1
MTOBOD	-0,0067	0,0701	-0,042	-0,063	0,0209	-0,0331	-0,034	-0,0407
BLOCKHOLD	0,0126	0,0154	0,0321	0,0259	0,0266	-0,0082	-0,1242	-0,1172
BIG4AUD	0,1451	-0,1024	0,2992	0,3003	0,2053	0,2136	-0,1545	-0,1745
SIZE	0,0324	-0,2462	0,1766	0,3684	-0,1376	0,3344	-0,0732	-0,0791
MKTBK	-0,0097	-0,0036	0,0047	-0,0026	0,0617	-0,0238	0,0567	0,0567
ROA	-0,0374	-0,0196	0,0141	0,1082	0,1392	0,0193	0,043	0,0162
LEV	-0,0968*	-0,2149	0,0398	0,0992	-0,0278	0,2085	0,1527	-0,0692
CASH	-0,0877*	-0,0516	0,1102	0,0201	0,0366	0,0295	-0,0516	0,0642

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Panel B (continued in the next page): Correlation Matrix of ETR

MTOBOD	BLOCKHOLD	BIG4AUD	SIZE	MKTBK	ROA	LEV	CASH
1							
0,977	1						
-0,0622	-0,0236	1					
-0,2061	-0,1387	0,499	1				
-0,0022	0,001	-0,0475	-0,0209	1			
-0,1504	-0,156	0,1873	0,1384	0,0284	1		
-0,1054	-0,0656	0,1148	0,3557	-0,0252	0,0134	1	
-0,0513	-0,0783	0,2661	0,1187	0,0113	0,3143	-0,2481	1

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: OLS Regression Results

| VARIABLES	Predicted sign	(1) PERMBTD	(2) ETR	(3) PERMBTD	(4) ETR	(5) PERMBTD	(6) ETR
Pwom	-	-0.0503*	-2.090	-0.115**	-0.590	-0.0272	-2.680
		(0.0296)	(2.751)	(0.0554)	(2.502)	(0.0213)	(1.716)
BIND	-	-0.0131	4.599	0.0629	4.550*		
		(0.0269)	(2.794)	(0.0507)	(2.491)		
PETHDIVBOD	-	-0.00416	-2.590	0.00261	-2.534		
		(0.0267)	(2.604)	(0.0515)	(2.317)		
FINTAXEXP	?	0.00817	-1.101	-0.0627*	-0.433		
		(0.0189)	(1.832)	(0.0353)	(1.667)		
AGEDIR	-	-0.000221	0.0544	0.000524	0.0338		
		(0.000666)	(0.0561)	(0.00124)	(0.0512)		
CEOTENURE	?	-0.000332	0.0166	0.00103	0.00158		
		(0.000365)	(0.0369)	(0.000694)	(0.0328)		
CEODUAL	+	0.0177**	-0.852	0.0159	-0.908		
		(0.00852)	(0.890)	(0.0159)	(0.802)		
MTOBOD	?	0.000516	-0.186	0.00237	-0.00173		
		(0.00129)	(0.506)	(0.00173)	(0.0879)		
BLOCKHOLD	-	-0.000869	0.263	0.000255	-0.0123		
		(0.000895)	(1.004)	(0.00161)	(0.110)		
BIG4AUD	?	0.0113	1.932**	0.00697	1.120		
		(0.0105)	(0.967)	(0.0178)	(0.790)		
MKTBK	?	-0.000122	-0.00974			-0.000156	-0.0170
		(0.000735)	(0.0530)			(0.000696)	(0.0439)
SIZE	+	0.000510	-0.144			0.000441	0.256
		(0.00517)	(0.575)			(0.00318)	(0.294)
ROA	-	-0.00881***	0.00439			-0.00777***	-0.0147
		(0.000546)	(0.0529)			(0.000423)	(0.0359)
LEV	?	-0.00153	-4.920**			-0.0162	-2.440*
		(0.0198)	(2.028)			(0.0151)	(1.273)
CASH	+	0.0892**	-9.346**			0.0749**	-3.464
		(0.0120)	(0)	(0.0229)	(1.077)	(0)	(0)
Constant		0.0328	-1.728	-0.00729	-3.973	0.0296	0.366
		(0.0448)	(4.412)	(0.0825)	(3.696)	(0.0188)	(1.637)
Year Dummies		Included	Included	Included	Included	Included	Included
Observations		338	190	380	204	483	279
R-squared		0.497	0.143	0.047	0.087	0.445	0.050

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Model summary statistics in the regression results of Table 4

Model summary statistics	(1)	(2)	(3)	(4)	(5)	(6)
Nymber of obs	338	190	380	204	483	279
F	16,57	1,5	1,29	1,28	37,85	1,42
Prob>F	0	0,0922	0,2108	0,2198	0	0,17
R-squeard	0,497	0.143	0.047	0.087	0.445	0.050
Adj R-squared	0,4675	0,0475	0,0106	0,0193	0,4332	0,015
Root MSE	0,6492	4,4381	0,13391	4,3506	0,06345	3,735

Appendix 3

Graph 1: Tax Revenues in Greece, 2014-2018

Tax revenue
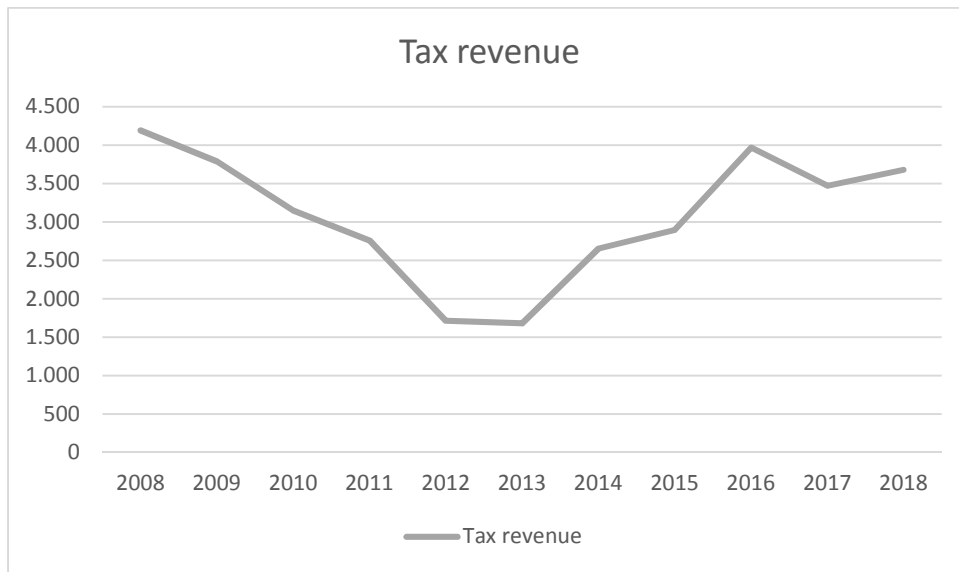
Graph 2: Income tax rates in Greece, 2014-2019

Income tax rate in Greece
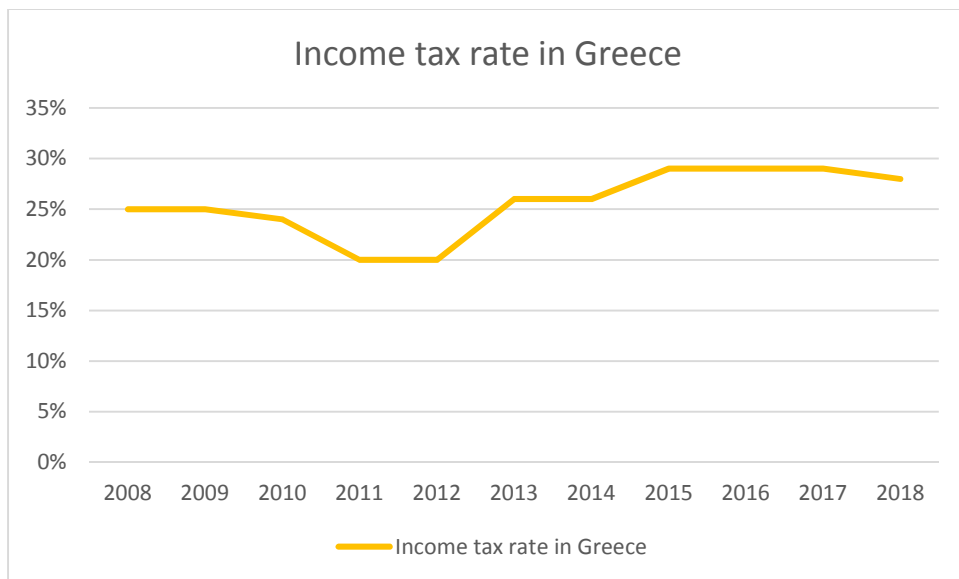
Graph 3: Tax aggressiveness and tax avoidance measure on 7 high rated journals by ABS Guide from 2014-2019:
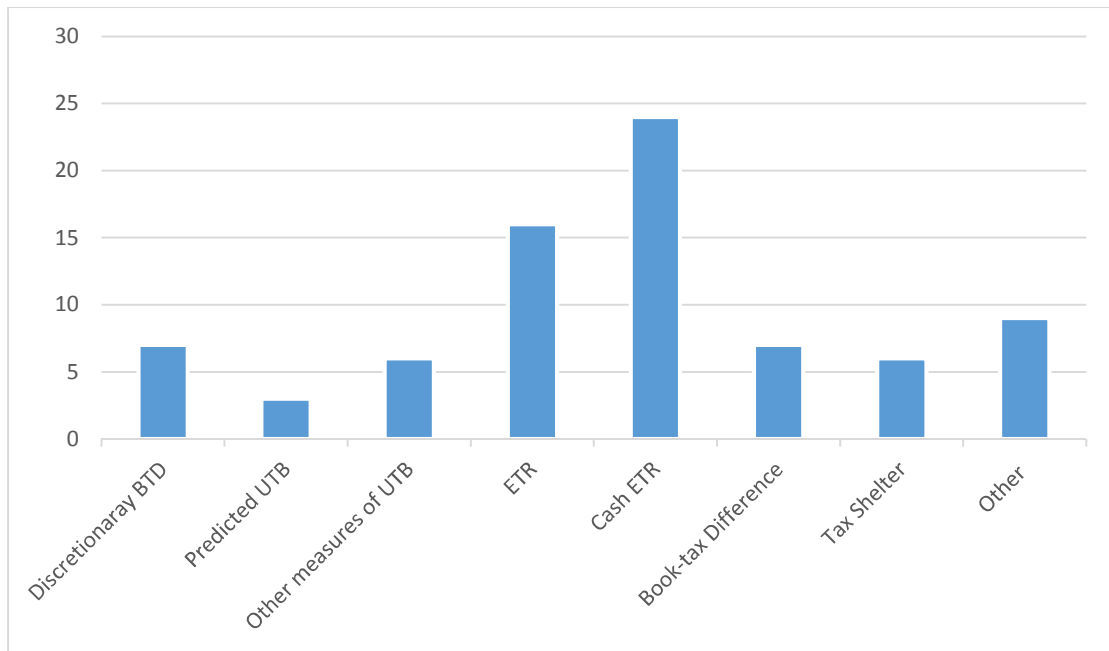
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