

Effects of Board Characteristics on Accruals Earnings Management in the Wake of Financial Crisis

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Abstract

This paper investigates the association between corporate governance and earnings management. More specifically, the effects of board characteristics on earnings management are examined. A proxy of earnings management, namely discretionary accruals (Modified Jones Model, 1995) is used to measure the level of earnings management. A sample of 103 firms listed on the Athens Stock Exchange during the period 2015-2019 was employed. Using panel data regressions, the authors explore the relationship between the discretionary accruals and five board characteristics as identified in the literature (independence, family directors, female directors, foreign directors, and CEO duality). The main findings of the study suggested that earnings management is restricted in firms with more independent directors and firms in which the same person takes the role of the CEO and the chairman of the board. Empirical results also indicate that in high performing firms earnings management is reduced while in firms with high levels of debt the opposite appears to be the case. The findings of the study have implications for many stakeholders such as regulators, managers, shareholders, etc. This paper contributes to the academic debate on earnings management by complementing the work of other researchers on the impact of corporate governance on earnings management in the wake of a financial crisis.

Keywords

Earnings Management, Accruals, Corporate Governance, Board Characteristics, Financial Crisis

1. Introduction

The worldwide accounting scandals combined with changes in corporate own-

ership and management gave rise to the study of the impact of corporate governance on earnings management (Klein, 2002; Jaggi et al., 2009; Prencipe & Yosef, 2011; González & García-Meca, 2014; Chi et al., 2015). The appropriate composition of the board is essential for an effective system of corporate governance. The Board of Directors (board) is the body that is elected by shareholders to act on their behalf by monitoring management's performance. Prior literature shows that different board characteristics may influence the effectiveness of monitoring managerial performance. Weak corporate governance may give rise in unethical managerial behavior which could result in lower earnings quality. An effective board can play a significant role in the accuracy of accounting information and monitoring of management. Prencipe & Yosef (2011) argue that "...certain aspects of a board of directors' structure improve the monitoring of managerial decisions. Among these decisions are a manager's policies about managing earnings". This study investigates the effects of board characteristics on earnings management in Greece using a sample of firms listed on Athens Stock Exchange (ASE) from 2015-2019.

The Greek context is quite interesting because Greece belongs to emerging markets since 2013 (MSCI) and is a country classified as code-law based on its legal regime, with low financial transparency, low audit quality and low analyst coverage (Bushman et al., 2004; Dimitropoulos & Asteriou, 2010). The legislation on governance in Greece consists of the various laws implemented in the first decade of the 2000s (e.g., 3016/2002, 3693/2008, 3873/2010). Therefore, during the study period (2015-2019), it is expected that all foreseeable changes have been assimilated. Moreover, in the Greek context, weak protection of minority shareholders has been reported (La Porta et al., 1997), while most firms in Greece have concentrated ownership and are controlled by a single shareholder or a family (Bekiris & Doukakis, 2011). The latter exacerbates the agency problems that corporate governance mechanisms try to resolve (Regoliosi & d' Eri, 2014). Vieira (2018) argues that in family firms the composition of the board affects its effectiveness, especially in periods of economic adversity. The survey of this paper was carried out in the wake of the unprecedented economic crisis that started in 2009 in Greece.

The effects of corporate governance on earnings management in the Greek setting have been studied for the periods before and during the crisis; Chavelas & Tzovas (2010) examined the effect of the mandatory adoption of corporate governance mechanisms on serious firm issues like earnings manipulation and management effectiveness on a sample of firms listed on the Athens Stock Exchange for the period 2000-2003. They found that the mandatory corporate governance mechanisms have no impact on firms' effectiveness and earnings manipulation; Bekiris & Doukakis (2011) examined the association between corporate governance and discretionary accruals using a sample of firms listed on Athens, Milan and Madrid stock exchanges in the year 2008. They found a negative relationship between a corporate governance index and earnings manage-

ment, suggesting that firms which adopt high corporate governance standards tend to manipulate earnings less; [Smaraidos et al. \(2018\)](#) examined the effects of board, audit committee and firm's financial health on earnings management on a sample of Greek listed firms for the years 2011-2015. They found that an independent board in combination with an active audit committee and a large audit firm could restrict firms' tendency towards earnings management, however large firms and firms in financial distress are more likely to manage earnings; [Kalan-tonis et al. \(2021\)](#) examined the relationship between board characteristics and earnings management using a sample of listed firms on Athens Stock Exchange (2008-2016) and provide evidence that during the years of the financial crisis, CEO duality negatively affected earnings management.

This study complements the findings of previous research by investigating the effect of the board on earnings management in the period of crisis de-escalation (2015-2019). The main results showed a significant effect of board independence and CEO duality on management's tendency to manipulate earnings. Specifically, a board with more independent directors, in which the roles of the Chairman of the board and the CEO are not split, is associated with lower earnings management. These findings can be generalized to other emerging markets with similar institutional environments and have implications for policymakers, researchers, investors, managers, and any other stakeholder interested in the good governance of the firm and its efficient management.

The rest of the paper is organized as follows. Section 2 reviews the theoretical background and presents the research hypotheses, Section 3 describes the research methodology, Section 4 discusses the results and Section 5 lays out the conclusion of the study.

2. Theoretical Background and Hypotheses Development

The separation of ownership and control in the modern business world is directly linked to the creation of agency problems. According to the agency theory ([Jensen & Meckling, 1976](#)) the interests of shareholders and managers are not always aligned. The last might pursue their own interests at the expense of the first ([Jensen, 1986](#)) and earnings management is one of the means to achieve this. Earnings management occurs when insiders use their discretion in financial reporting to mislead other stakeholders or to influence contractual outcomes and meet certain earnings thresholds ([Healy & Wahlen, 1999](#)). The purpose of corporate governance is to regulate issues arising by the separation of ownership and control. Corporate governance ensures compliance with accounting standards, which increases the reliability of financial statements. Therefore, the enhancement of corporate governance mechanisms could restrict earnings management techniques.

Prior research examines the effect of corporate governance on earnings management ([Dechow et al., 1996](#); [Klein, 2002](#); [Peasnell et al., 2005](#); [González & García-Meca, 2014](#); [Abbadi et al., 2016](#)), in some cases using corporate gover-

nance indicators, while in other cases examining the effect of boards composition (board of directors, audit committee) and ownership structure. For example, [Abadi et al. \(2016\)](#) investigated the effect of a corporate governance index on earnings management, concluding that the higher the quality of corporate governance, the lower the likelihood of earnings management. Their findings also indicate that strong compliance with standards regarding board of directors (size, independence, CEO duality) helps prevent earnings manipulation. Drawing on this ongoing debate, this paper focuses on the board of directors and its association with earnings management. Relying on prior literature five board composition characteristics, which are expected to be associated with earnings management, were identified. Namely, board independence, female directors, family directors, foreign directors, and CEO duality.

One of the main characteristics of the board composition is its independence. [Srinidhi et al. \(2011\)](#) indicate that while executive directors have an incentive to conceal or delay reporting bad performance to investors, independent directors have an incentive to maintain their reputation by ensuring more candid reporting by managers. However, previous research examining the effect of this parameter, have reached different results. Although some studies have found no significant relationship between board independence and earnings management ([Abed et al., 2012](#)), many studies have concluded that an independent board can limit management's tendency to manage earnings ([Jaggi et al., 2009](#); [Prencipe & Yosef, 2011](#); [González & García-Meca, 2014](#); [Kusnadi et al., 2022](#)), arguing that independent directors monitor management's behavior more effectively due to the lack of ties and conflicts of interest. On the other hand, there are some studies which have reached the opposite conclusion, that independent board directors contribute to the increase of earnings management ([Alareeni, 2018](#)), arguing that board independence increases board control of firms and, therefore, reduces management's ability to manage earnings. Despite the conflicting findings of the literature, we expect that the higher the independence of the board, the greater its ability to control and, by extension, constrain opportunistic behaviors of the management. Thus, the following hypothesis is formulated:

H1: Board independence negatively affects earning management.

There are two opposing arguments regarding the effect of the presence of family directors on the board. On the one hand, family directors may restrict managers' ability to manage earnings because they tend to have longer investment horizons, long-term ties with the firm and they care more about firm's reputation. On the other hand, family control is associated with weaker investor protection ([Leuz et al., 2003](#)), greater motivation to generate extra personal facilities and political connections ([Gadhoun, 2021](#)) and greater tendency of majority shareholders to expropriate minority shareholders' interests ([Jaggi et al., 2009](#)) through earnings management. The assignment of family directors on board reduces its monitoring effectiveness leading to inferior corporate governance and lower earnings quality ([Wang, 2006](#)). Along the same line, [Chi et al.](#)

(2015), who examined a sample of listed firms in Taiwan region, found that family firms are more likely to engage in earnings management than nonfamily firms. In addition, Jaggi et al. (2009) found that the effectiveness of the monitoring of earnings management by the boards is mitigated in family-controlled firms, either through the concentration of ownership or through the presence of family directors on the boards. Drawing on these arguments the following hypothesis is formulated:

H2: Family directors positively affect earning management.

Prior studies indicate that female directors are more risk-averse (Sunden & Surette, 1998; Rau, 2014) and more moral (Bernardi & Arnold, 1997) than male directors. Also, their skills, talents and beliefs could improve financial reporting quality (Koutoupis et al., 2022). On this basis, in many countries and in Greece, since 2020 (Law 4706/2020), it has been established that adequate gender representation (of more than 25% of the total number of directors) is required. Srinidhi et al. (2011) examined whether U.S. firms with gender-diverse boards exhibit higher quality earnings, concluding that female board participation increases earnings quality by the oversight function of the board. Specifically, they used three different variables for female board participation: at least one female director on board; at least one female nonexecutive director on board and at least one female director on the audit committee, and all were found to have a statistically significant negative effect on earnings management. Similarly, Arun et al. (2015) concludes that the presence of female directors and independent female directors on board could restrict earnings management and Gavius et al. (2012) further found that earnings management is lower when either the CEO or CFO is a woman. Based on the previous discussion the following hypothesis is formulated:

H3: Female directors negatively affect earning management.

The presence of foreign directors on the board is anticipated to bring in knowledge and expertise from foreign markets through their different culture and educational professional backgrounds (Handa, 2021). The internationalization of business imposes the heterogeneity on the board for a firm to become more competitive. Hooghiemstra et al. (2019) studied a sample of Nordic listed firms on how board internationalization may affect monitoring quality of boards. They found that the presence of non-Nordic foreign directors is positively associated with earnings management, suggesting that this effect is due to factors related to the language and accounting knowledge of foreign directors. Almutairi & Quttainah (2020) report that while in conventional banks the presence of foreign directors reduces the ability of boards to restrict the opportunistic behavior of management, in Islamic banks the presence of foreign directors increases this ability. In addition, Du et al. (2017), in a sample of Chinese listed firms, found that the presence of foreign directors on corporate boards helps in prevention of earnings management practices. Despite the conflicting results of the literature, a negative effect of foreign directors on earnings management is

expected in this study. The measure used, according to Hooghiemstra et al. (2019), is the origin of the directors: each board director not originating from the country of the survey (non-Greek foreign directors) was defined as a foreign director, thus the following hypothesis is formulated:

H4: Foreign directors negatively affect earning management.

CEO duality indicates that a manager is simultaneously the CEO and the chairman of the board. The duality leads to the concentration of power and authority in one person, which reduces board's effectiveness to monitor managerial decisions. However, a person that concentrates the authority, sets the strategic direction of the firm, and makes clear "who is the boss" leads to effective decision making (Finkelstein & D'aveni, 1994). Prior literature provides mixed evidence about the association between CEO duality and earnings management. For example, Davidson et al. (2005), Rahman & Ali (2006) and Alareeni (2018) found no significant relationship between the two variables while Gulzar & Wang (2011), Prencipe & Yosef (2011) and Iraya et al. (2015) found that the separation of the two roles leads to the reduction of earnings management in listed firms in China, Italy, and Kenya, respectively. On the other hand, Chi et al. (2015) investigating the effect of CEO duality on earnings management techniques in listed firms in Taiwan region concluded that duality contributes to the reduction of earnings management. Kalantonis et al. (2021) reached the same conclusion in their recent research in Greece, arguing that powerful CEOs were reluctant to apply earnings management techniques in a period of severe economic crisis. Due to the conflicting results the following hypothesis is formulated:

H5: CEO duality positively/negatively affect earning management.

Hypothesized associations between earnings management and board characteristics are summarized in Figure 1.

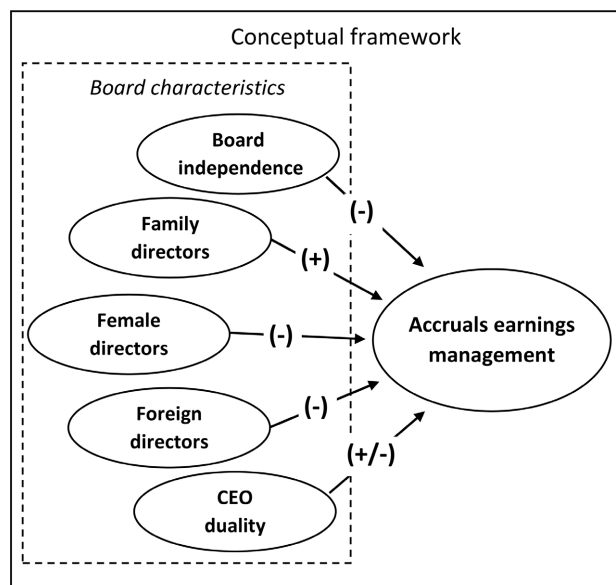


Figure 1. Conceptual framework.

3. Research Methodology

3.1. Sample

The sample comprises Greek firms listed on Athens Stock Exchange (ASE) for the period 2015-2019. Financial data were extracted from Compustat, while corporate governance characteristics were hand-collected from annual reports as well as the firms' websites.¹ In our sample period, there were 163 firms listed on the ASE. Firms belonging in finance and real estate were excluded due to the specificity of their operations, the reporting requirements which differentiate them from other firms and their different earnings management motives. Moreover, firms with reporting period other than 31st of December and firm-years with missing data, necessary to calculate the variables of the models, were also excluded. The final sample consists of 103 firms and 504 firm-year observations. The composition of the sample is shown in **Table 1**.

3.2. Measurement of Discretionary Accruals

To measure accrual-based earnings management, the Modified Jones model (Dechow et al., 1995) was used, estimated cross-sectionally for every industry and year:

$$\frac{TACC_{it}}{AT_{it-1}} = \beta_{1t} \frac{1}{AT_{it-1}} + \beta_{2t} \frac{\Delta SALES_{it} - \Delta REC_{it}}{AT_{it-1}} + \beta_{3t} \frac{PPE_{it}}{AT_{it-1}} + \varepsilon_{it} \quad (1)$$

where for firm i in year t , $TACC$ is the Total Accruals estimated using the cash flow approach ($TACC = \text{Net Income} - \text{Cash flow from operations}$), AT_{it-1} is Total Assets in year $t-1$, $\Delta SALES$ is change in net sales from year $t-1$ to t , ΔREC is change in Receivables (trade) from year $t-1$ to t , PPE is Gross Property Plant and Equipment in year t , and ε is the random error term.

The residuals from the estimation of model (1) are the discretionary accruals, DA . The absolute value of DA ($ABSDA$) was calculated as earnings management

Table 1. Sample selection and elimination procedure.

	Firms
Population of firms listed on the Athens Stock Exchange (period 2015-2019)	163
<i>Elimination</i>	
1) Finance and real estate	(11)
2) Suspended from trading (Athens Stock Exchange Authority)	(12)
3) Missing financial data (not available on Compustat)	(16)
4) Reporting period different from 31st December	(4)
5) Missing board composition data	(17)
Final sample	103

¹Financial data was also collected for 2014, although the analysis was done for the period 2015-2019, to compute the earnings management measure.

proxy. The classification of firms into sectors of economic activity according to “Industry Classification Benchmark (ICB)” was used. Some industries, containing important firms in Greece with large market capitalization (Constantatos, 2018), were combined² because otherwise would have been excluded, since an adequate number of firms (at least 5) in each industry is required (Dechow et al., 1995; Sharma et al., 2011; Alhaddad et al., 2022).

3.3. Model Specification

The model below is used to test the hypotheses of the study:

$$ABSDA = a_0 + \beta_1 INDEP_{it} + \beta_2 FAMILY_{it} + \beta_3 FEMALE_{it} + \beta_4 FOREIGN_{it} + \beta_5 DUALITY_{it} + \beta_6 BIG4_{it} + \beta_7 LEV_{it} + \beta_8 ROA_{it} + \beta_9 SIZE_{it} + e_{it} \quad (2)$$

The model combines board characteristics (predictor variables) with firm characteristics (control variables). Predictor variables test the argument of this study as outlined in Section 2; Control variables are based on the literature and involve factors that can potentially affect earnings management. Following previous studies four control variables are included, namely Big 4, leverage, ROA and firm size.

High-quality auditors contribute to lessen earnings management and also affect the construction of firms’ internal control (Becker et al., 1998). Viana et al. (2022) found that while a firm’s level of financial distress positively affects accrual-based earnings management, this effect is weaker for firms audited by a Big 4 audit firm. Therefore, a variable for the audit firm was included in the model expecting a negative effect on earnings management. *BIG4* is a dummy variable that equals one if the financial reports are audited by one of the four biggest accounting firms (Ernst & Young, Deloitte, KPMG, PricewaterhouseCoopers) and zero otherwise.

Another control variable included in the model is leverage (*LEV*). Highly leveraged firms may have greater incentives to manage earnings to avoid debt covenant violation (DeFond & Jiambalvo, 1994). On the other hand, Christie & Zimmerman (1994) suggest that high leverage may restrict managers’ opportunistic behavior. In the years following the 1994 studies the same situation continued in the literature with some studies supporting the positive effect of leverage on earnings management (Iqbal & Strong, 2010; González & García-Meca, 2014; Abbadi et al., 2016; Elghuweel et al., 2017) and others the negative one (Prencipe & Yosef, 2011; Arun et al., 2015; Chi et al., 2015). Therefore, directional sign of leverage (*LEV*) was not provided.

Profitability is another variable that is expected to have an impact on earnings management, thus the variable *ROA* (return on assets) was included in the model as a measure of firm’s performance. Mixed results are found in the literature

²“Energy” is combined with “Industrials”; “Utilities and Telecommunications” is combined with “Media”; “Healthcare” is combined with “Personal Care, Drugs & Grocery”, “Consumer Goods” and “Consumer Services”.

with studies suggesting that more profitable firms tend to manage earnings less (Prencipe & Yosef, 2011; Abbadi et al., 2016), while others suggesting that more profitable firms are more likely to use earnings management techniques (Arun et al., 2015; Elghuweel et al., 2017). Finally, firm size (*SIZE*) is used since larger firms are less likely to manage earnings because they have more developed internal control systems (Gong et al., 2013). Although some studies have found a positive relationship between firm size and earnings management (Jaggi et al., 2009; Arun et al., 2015) in this study a negative relationship is expected according to literature (Prencipe & Yosef, 2011; Chi et al., 2015; Abbadi et al., 2016). The definition and measurement of all variables included in the model is presented in **Table 2**.

Table 2. Variables definition and measurement.

Variable	Definition	Measurement
<i>Dependent variable</i>		
<i>ABSDA</i> :	Absolute Discretionary Accruals	Absolute Discretionary Accruals represent an unsigned Earnings Management proxy estimated by the Modified Jones Model
<i>Explanatory variables</i>		
<i>INDEP</i> :	Board independence	Proportion of non-executive directors over the total number of directors
<i>FAMILY</i> :	Family directors	Proportion of family directors over the total number of directors
<i>FEMALE</i> :	Female directors	Proportion of female directors over the total number of directors
<i>FOREIGN</i> :	Foreign directors	Proportion of foreign directors over the total number of directors
<i>DUALITY</i> :	CEO duality	Dummy variable (1 if the chief executive officer is also chairman of the board, 0 otherwise)
<i>Control variables</i>		
<i>BIG4</i> :	Audit firm size	Dummy variable (1 if audit firm is a Big4 firm, 0 otherwise)
<i>LEV</i> :	Leverage	Ratio of (Total Long-Term Debt + Debt in Current Liabilities)/Total Assets
<i>ROA</i> :	Return On Assets	Income Before Extraordinary Items to Total Assets
<i>SIZE</i> :	Firm size	Total assets (logarithm)

4. Results and Discussion

4.1. Descriptive Analysis

Table 3 provides descriptive statistics for the dependent and independent variables. The mean value of Absolute Discretionary Accruals (*ABSDA*) is close to zero, which is logical since this variable is the residuals of a regression. The 27% of directors in the sample are non-executive directors (*INDEP*), while the 41% of chief executive officers hold the position of chairman of the board (*DUALITY*). In a small part of the sample, firms are audited by one of the Big4 (*BIG4*) firms (mean 0.206) while the negative *ROA* indicates that the “mean firm” is non-profitable.

Several of the results (independence, female directors, CEO duality, leverage) are in line with those of Kalantonis et al. (2021), even though their period of analysis extends before the period of this study. The latter suggests that there have been no major changes in the level of corporate governance and adoption of best practices in Greece; both the percentages of female (14.1% - 14%, respectively) and independent directors (25.1% - 27%, respectively) remain at low

Table 3. Descriptive statistics for the variables.

<i>Scores</i>	<i>Mean</i>	<i>Std.dev.</i>	<i>Min</i>	<i>Max</i>
<i>ABSDA</i>	0.040	0.038	0	0.296
Independent variables				
<i>INDEP</i>	0.270	0.163	0	0.777
<i>FAMILY</i>	0.240	0.186	0	0.714
<i>FEMALE</i>	0.140	0.152	0	0.666
<i>FOREIGN</i>	0.056	0.145	0	0.714
<i>DUALITY</i>	0.413	0.492	0	1
<i>BIG4</i>	0.206	0.405	0	1
<i>LEV</i>	0.421	0.335	0	1.72
<i>ROA</i>	-0.008	0.072	-0.282	0.139
<i>SIZE</i>	4.667	1.771	0.624	9.759

Notes: *ABSDA* = an unsigned Earnings Management proxy estimated by the Modified Jones Model; *INDEP* = board independence, measured as the proportion of non-executive directors over the total number of directors; *FAMILY* = family directors, measured as the proportion of family directors on board over the total number of directors; *FEMALE* = female directors, measured as the proportion of female directors over the total number of directors; *FOREIGN* = foreign directors, measured as the proportion of foreign directors over the total number of directors; *DUALITY* = CEO duality, dummy variable (1 if the chief executive officer is also chairman of the board, 0 otherwise); *BIG4* = audit firm size, dummy variable (1 if audit firm is a Big4 firm, 0 otherwise); *LEV* = leverage, measured as the ratio of (Total Long Term Debt + Debt in Current Liabilities)/Total Assets; *ROA* = Return On Assets, measured as Income Before Extraordinary Items to Total Assets; *SIZE* = firm size, measured as a logarithm of total assets.

levels, while the duality of the CEO remains at high levels (43.3% - 41.3%). Similar results, regarding the duality of the CEO in Greek firms were also found by Vadasi et al. (2021) covering a sample of listed firms on ASE for 2017, where the 46.24% of them assigned to the same person both positions.

4.2. Correlation Analysis

Table 4 provides Pearson correlations for all variables in the model. There is a significant negative correlation (at the 5% level) between CEO duality (*DUALITY*) and earnings management (*ABSDA*). Also, leverage (*LEV*) is positively and profitability (*ROA*) negatively correlated with earnings management (*ABSDA*) (1% level), indicating that earnings management is more prominent in high leveraged firms and less present in profitable entities. Firm size (*SIZE*) is negatively correlated with the participation of the family in the board (*FAMILY*) and positively correlated with independent directors (*INDEP*), while BIG4 firms are not selected by firms with family directors in order to audit their financial statements (coefficient -0.22 , statistically significant at 1% level). The correlation coefficients mentioned above provide preliminary evidence about a significant impact of the separation of the position of the CEO and the chairman of the board (*DUALITY*) on discretionary accruals. Finally, while the data indicates significant correlations among many variables, the coefficients are below 0.8 suggesting that there are no multicollinearity problems.

Table 4. Correlation coefficients for the variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1) <i>ABSDA</i>	1.000									
2) <i>INDEP</i>	0.052	1.000								
3) <i>FAMILY</i>	-0.051	-0.322***	1.000							
4) <i>FEMALE</i>	-0.068	-0.091**	0.435***	1.000						
5) <i>FOREIGN</i>	0.016	0.279***	-0.148***	0.046	1.000					
6) <i>DUALITY</i>	-0.099**	-0.105**	0.127***	0.202***	-0.108**	1.000				
7) <i>BIG4</i>	0.033	0.090**	-0.220***	-0.137***	0.381***	-0.070	1.000			
8) <i>LEV</i>	0.207***	0.029	0.028	-0.039	-0.005	-0.045	-0.014	1.000		
9) <i>ROA</i>	-0.218***	0.020	0.011	0.009	0.035	0.055	0.138***	-0.555***	1.000	
10) <i>SIZE</i>	-0.013	0.222***	-0.367***	-0.270***	0.155***	-0.128***	0.456***	-0.152***	0.280***	1.000

Notes: ***, **, * statistically significant at the 0.01, 0.05 and 0.10 level respectively; *ABSDA* = an unsigned Earnings Management proxy estimated by the Modified Jones Model; *INDEP* = board independence, measured as the proportion of non-executive directors over the total number of directors; *FAMILY* = family directors, measured as the proportion of family directors on board over the total number of directors; *FEMALE* = female directors, measured as the proportion of female directors over the total number of directors; *FOREIGN* = foreign directors, measured as the proportion of foreign directors over the total number of directors; *DUALITY* = CEO duality, dummy variable (1 if the chief executive officer is also chairman of the board, 0 otherwise); *BIG4* = audit firm size, dummy variable (1 if audit firm is a Big4 firm, 0 otherwise); *LEV* = leverage, measured as the ratio of (Total Long Term Debt + Debt in Current Liabilities)/Total Assets; *ROA* = Return On Assets, measured as Income Before Extraordinary Items to Total Assets; *SIZE* = firm size, measured as a logarithm of total assets.

4.3. Regression Analysis

To test Equation (2) a Hausman Test was conducted (omitted), since this study was based on panel data, and found that the fixed-effects model is more appropriate than the random effects model ($\chi^2 = 27.53$; p -value = 0.0011), since the null hypothesis of no significant difference between the fixed and random effects models is rejected. **Table 5** presents the results of the regression analysis. The findings of the study provide support for the hypotheses H1 (board independence) and H5 (CEO duality). Both variables (*INDEP* & *DUALITY*) are negatively associated with earnings management practices at the 1% level of significance.

Specifically, it was found that board independence is significantly ($p = 0.009$) associated with lower probability of exhibiting earnings management practices, corroborating previous findings in the literature (Jaggi et al., 2009; González &

Table 5. Regression analysis (Modified Jones Model, *ABSDA*).

Variables	Coefficient	ABSDA Std. error	t-Statistic	Prob.
<i>INDEP</i>	-0.0633***	0.0240	-2.63	0.009
<i>FAMILY</i>	0.0091	0.0480	0.19	0.850
<i>FEMALE</i>	-0.0053	0.0378	-0.14	0.887
<i>FOREIGN</i>	-0.0051	0.0323	-0.16	0.873
<i>DUALITY</i>	-0.0288***	0.0092	-3.12	0.002
<i>BIG4</i>	0.0159	0.0141	1.13	0.026
<i>LEV</i>	0.0317**	0.0149	2.13	0.034
<i>ROA</i>	-0.1582***	0.0391	-4.05	0.000
<i>SIZE</i>	-0.0145	0.0109	-1.34	0.182
<i>Constant</i>	0.1186**	0.0566	2.09	0.037
<i>Observations</i>	503			
<i>R-Squared</i>	0.116			
<i>Fixed effects</i>	YES			

Notes: ***, **, * statistically significant at the 0.01, 0.05 and 0.10 level respectively; *ABSDA* = an unsigned Earnings Management proxy estimated by the Modified Jones Model; *INDEP* = board independence, measured as the proportion of non-executive directors over the total number of directors; *FAMILY* = family directors, measured as the proportion of family directors on board over the total number of directors; *FEMALE* = female directors, measured as the proportion of female directors over the total number of directors; *FOREIGN* = foreign directors, measured as the proportion of foreign directors over the total number of directors; *DUALITY* = CEO duality, dummy variable (1 if the chief executive officer is also chairman of the board, 0 otherwise); *BIG4* = audit firm size, dummy variable (1 if audit firm is a Big4 firm, 0 otherwise); *LEV* = leverage, measured as the ratio of (Total Long Term Debt + Debt in Current Liabilities)/Total Assets; *ROA* = Return On Assets, measured as Income Before Extraordinary Items to Total Assets; *SIZE* = firm size, measured as a logarithm of total assets.

García-Meca, 2014). Furthermore, a negative relationship between CEO duality and earnings management was found ($p = 0.002$), a result that contradicts some prior studies (Iraya et al., 2015; Saona et al., 2020), but is consistent with other findings (Chi et al., 2015; Kalantonis et al., 2021), suggesting that a “powerful” CEO, who sets company’s strategic goals can restrict managers’ earnings manipulation practices. These results indicate that firms with higher percentage of independent directors and firms that place the same person in both positions of CEO and chairman of the board are less likely to exhibit earnings management practices. Contrary to expectations, the analysis did not show any significant association between female, foreign and family participation at the board and earnings management ($p > 0.10$) and consequently did not support H3, H4 and H5, respectively. However, the resulted signs provided in **Table 5** for these variables are in accordance with the predicted signs as outlined in Section 2.³

Regarding control variables, it was found that firms with low leverage ratio and high profitability are more likely not to exhibit earnings management practices. Evidence of a positive relationship (5% significance level) between leverage and earnings management was found in line with similar studies (Iqbal & Strong, 2010; Elghuweel et al., 2017), suggesting that highly leveraged firms may have greater incentives to manage their profits to avoid consequences on their creditworthiness, loan covenants, etc. Moreover, firms’ performance (*ROA*) is negatively associated with earnings management at the 1% level of significance, as shown in the literature (Prencipe & Yosef, 2011; Abbadi et al., 2016), suggesting that in high performing firms, management has low motivation to manage earnings.

4.4. Robustness Test

To test the robustness of the results, the Jones Model (Jones, 1991) was employed as an alternative proxy for earnings management (*ABSJONESDA*). The Jones model relates accruals to change in Sales and Property Plants and Equipment. Its’ difference with the modified model is that it does not take into account the possible discretion arising from credit sales (DeFond & Jiambalvo, 1994) and it implicitly assumes that revenue change is not discretionary. However, it is a model widely used in literature and it is below:

$$\frac{TACC_{it}}{AT_{it-1}} = \beta_{1t} \frac{1}{AT_{it-1}} + \beta_{2t} \frac{\Delta SALES_{it}}{AT_{it-1}} + \beta_{3t} \frac{PPE_{it}}{AT_{it-1}} + \varepsilon_{it} \quad (3)$$

We estimated the Jones Model (3) cross-sectionally for every industry and year, using the same industry classification as in Equation (1) and we obtained the absolute value of discretionary accruals (*ABSJONESDA*). After conducting a Hausman test (omitted) and rejecting the random effects model ($\chi^2 = 24.43$; p -value = 0.0037), we run the main empirical model (Equation (2)) with fixed

³Female directors (Srinidhi et al., 2011; Arun et al., 2015) and foreign directors (Du et al., 2017) decrease earnings management, while family directors (Jaggi et al., 2009; Chi et al., 2015) increase earnings management.

Table 6. Regression analysis (Jones Model—*ABSJONESDA*).

Variables	Coefficient	<i>ABSJONESDA</i> Std. error	t-Statistic	Prob.
<i>INDEP</i>	-0.724***	0.0261	-2.77	0.006
<i>FAMILY</i>	0.0203	0.0522	0.39	0.697
<i>FEMALE</i>	-0.0235	0.0411	-0.57	0.567
<i>FOREIGN</i>	-0.0174	0.0351	-0.50	0.620
<i>DUALITY</i>	-0.0344***	0.0100	-3.43	0.001
<i>BIG4</i>	0.2471	0.0153	1.61	0.109
<i>LEV</i>	0.0250	0.0161	1.55	0.123
<i>ROA</i>	-0.1363***	0.0424	-3.21	0.001
<i>SIZE</i>	-0.0082	0.0118	-0.70	0.485
<i>Constant</i>	0.973	0.0615	1.58	0.115
<i>Observations</i>	503			
<i>R-Squared</i>	0.101			
<i>Fixed effects</i>	<i>YES</i>			

Notes: ***, **, * statistically significant at the 0.01, 0.05 and 0.10 level respectively; *ABSJONESDA* = an unsigned Earnings Management proxy estimated by the Jones Model; *INDEP* = board independence, measured as the proportion of non-executive directors over the total number of directors; *FAMILY* = family directors, measured as the proportion of family directors on board over the total number of directors; *FEMALE* = female directors, measured as the proportion of female directors over the total number of directors; *FOREIGN* = foreign directors, measured as the proportion of foreign directors over the total number of directors; *DUALITY* = CEO duality, dummy variable (1 if the chief executive officer is also chairman of the board, 0 otherwise); *BIG4* = audit firm size, dummy variable (1 if audit firm is a Big4 firm, 0 otherwise); *LEV* = leverage, measured as the ratio of (Total Long Term Debt + Debt in Current Liabilities)/Total Assets; *ROA* = Return On Assets, measured as Income Before Extraordinary Items to Total Assets; *SIZE* = firm size, measured as a logarithm of total assets.

effects regression. As can be seen from **Table 6**, the baseline results, are not sensitive to the selection of discretionary accruals' estimation model; the independence of the board and the duality of the CEO were found to be significantly and negatively related to earnings management.

5. Conclusion

This paper examines the effects of board characteristics on earnings management in Greek listed firms, using data from 2015 to 2019, a period way after the implementation of governance laws (e.g., 3016/2002, 3693/2008, 3873/2010) and in the wake of the financial crisis. A proxy of earnings management, namely discretionary accruals (Modified Jones Model, 1995) is used to measure the level of earnings management. The characteristics of board composition investigated are variables that have been identified in the literature as factors that affect the ex-

tent to which a firm's management manipulates earnings. Namely, independence, family directors, female directors, foreign directors, and CEO duality.

The results partially confirmed the research hypotheses by showing a negative effect of board independence and CEO duality on earnings management. Specifically, the findings were consistent with the literature (Prencipe & Yosef, 2011; González & García-Meca, 2014) reporting that in firms with high percentages of independent board directors, the management is less likely to act opportunistically since independent directors monitor its behavior more effectively due to the lack of conflicts of interest. Moreover, the results suggest that in firms with a "powerful" CEO who has concentrated authority, responsibility, and accessibility from both positions (CEO and chairman), management is less likely to manage earnings (Chi et al., 2015; Kalantonis et al., 2021). Finally, the impact of some firm characteristics on earnings management was examined, concluding that firms with high profitability (Elghuweel et al., 2017) and low levels of debt (Abbadi et al., 2016) are less likely to exhibit earnings management practices.

This paper contributes to the academic debate on earnings management (Lo, 2008; Prencipe et al., 2008; Garcia-Meca & Sánchez-Ballesta, 2009; El Diri et al., 2020; Gonidakis et al., 2022) and complements the findings of previous research linking earnings management to corporate governance, specifically board composition (Klein, 2002; Rahman & Ali, 2006; Jaggi et al., 2009; Hooghiemstra et al., 2019; Saona et al., 2020) in emerging markets (Abed et al 2012; Chi et al., 2015; Abbadi et al., 2016; Alhaddad et al. 2022). The research was conducted in Greece in the aftermath of a major fiscal crisis, complementing the results of Kalantonis et al. (2021) who investigated the relationship between earnings management and board characteristics during the crisis period in Greece. The findings have implications for investors, shareholders and senior management who wish to increase the effectiveness of control mechanisms such as the board and the CEO, to prevent opportunistic behavior within the firm. In addition, the results are useful for regulators and bodies issuing corporate governance codes as they will be able to target more precisely those points that prove to be critical to avoid earnings management and enhance transparency.

A limitation of the research is that the data used are from ASX-listed firms operating in the Greek environment with specific social and economic characteristics. The latter leads to a requirement for caution in generalizing the findings. Finally, while this study focuses on the effects of board characteristics on accrual-based earnings management, future research could examine the effects of other corporate governance variables (e.g., audit committee, internal audit, family/block/foreign ownership) on accrual-based earnings management or the effect of board composition and other corporate governance variables on real earnings management.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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