THE IMPACT OF THE CORPORATE GOVERNANCE ON FIRM PERFORMANCE: EVIDENCE FROM THE GREEK LISTED FIRMS

Petros Kalantonis [*], Sotiria Schoina [**], Christos Kallandranis [***]

* University of West Attica, Athens, Greece; Hellenic Open University, Patras, Greece
** University of West Attica, Athens, Greece
*** *Corresponding author*, University of West Attica, Athens, Greece
Contact details: University of West Attica, Egaleo Park Campus, Ag. Spyridonos Str., 28, Egaleo 12243, Athens, Greece

How to cite this paper: Kalantonis, P., Schoina, S., & Kallandranis, C. (2023). The impact of the corporate governance on firm performance: Evidence from the Greek listed firms [Special issue]. *Journal of Governance & Regulation, 12*(3), 255–265.
https://doi.org/10.22495/jgrv12i3siart7

ISSN Online: 2306-6784
ISSN Print: 2220-9352

Received: 23.01.2023
Accepted: 30.08.2023

JEL Classification: C30, G3, G32
DOI: 10.22495/jgrv12i3siart7

Abstract

This article explores the relationship between board quality and firm performance. The authors investigate any association between corporate governance and firm performance using a sample of listed firms on the Athens Stock Exchange (ATHEX) from 2008 to 2016 and two distinct performance models. This article expands on a previous study by Kalantonis et al. (2021) by including financial performance as assessed by both return on assets (ROA) and Tobin's Q. This investigation provides a global and comprehensive view of how specific aspects of corporate governance (CG) have influenced Greek listed companies during the period 2008–2016. Extending analysis also allows to capture the dynamics of the Greek financial crisis as well as the recent legal institutional framework concerning CG. The authors found that firms with more independent board members performed poorly in terms of ROA, while board size (BS) is positively related to performance in terms of Tobin's Q. Furthermore, a positive relationship was found between CEO duality (CEOD) and firm performance both in terms of ROA and Tobin's Q, and no relationship was found between board gender diversification and firm performance. Finally, it was concluded that the investigated GC aspects affect more the firms' performance than the firms' earnings management.

Keywords: Corporate Governance, Performance, Greek Listed Firms

Authors' individual contribution: Conceptualization — P.K.; Methodology — S.S.; Formal Analysis —S.S.; Investigation — S.S.; Writing — Original Draft — S.S.; Writing —Review & Editing — C.K.; Supervision — P.K. and C.K.; Project Administration — C.K.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

Several countries have implemented recommendations and/or mandatory regulations in recent years to strengthen the legal institutional structure concerning corporate governance (CG). Nevertheless, and despite the achieved advances, global CG failures during the previous two decades have revived interest in researching the relationship between CG and company success. The oversight responsibilities of boards have been emphasized, with the idea that independent, informed, and proactive boards should be the most valuable assets in the effort to protect the interests of investors (according to Sarbanes-Oxley Act (SOX), 2002), which is primarily firm performance.

Going back in time, the implosion of the big banks was largely responsible for the 2008 financial crisis. Further back in time, around the turn of the millennium, the Athens Stock Exchange (ATHEX) collapsed. Because of management's decisions and actions, the collapse was linked to a lack of

transparency and market exploitation. The reviled economic scandals prompted regulators to examine the efficiency of corporate governance mechanisms in the collapsed corporations. The logical next step was a push for additional regulation and to constrain and regulate corporate behaviour. The issued Law 3016/2002 on Corporate Governance, which was fully harmonized with European Union guidelines, sought to protect investors against market abuse, increase transparency, and develop proper business ethics. In accordance with European best practices in CG, the modified Law 3693/2008 for the mandatory formation of an audit committee required a significant number of independent non-executive board members to guarantee adequate board balance, optimal committee composition, and protection against any conflicts of interest. The most recent Law 4706/2020 on Corporate Governance of Listed Companies is even more detailed and enhances board gender diversification.

In this context, it is now vital to emphasize the benefits of a well-structured GC framework from both an ethical and an economic standpoint. A previous study by Kalantonis et al. (2021) has further focused on the ethical aspects of adopting GC practices, as earnings management cannot be isolated from board ethics. The purpose of this research is to explore how GC aspects affect firms' financial performance from an economic standpoint.

Several empirical studies have previously investigated the influence of CG practices on company performance, as a firm's various CG practices determine its behaviour and subsequently affect its stock market and accounting performance (Chow, 2005). Because the findings of these studies are diverse, research on the nature of these relationships remains mostly unclear. The purpose of this research is to investigate the association between CG and firms' performance during the period when the Greek economy and, as a result, Greek companies were massively hit by the economic crisis. The GC effect on the performance of Greek listed firms has already been investigated in prior literature. Chalevas (2011) found a substantial relationship between executive salary and firm performance following the introduction of the Corporate Governance Code. Hermes and Katsigianni (2011) found that better-governed enterprises outperform in terms of both return on assets (ROA) and Tobin's Q. Constantatos (2018) found that the positive relationship between CG and firm performance transformed into a negative relationship during the Greek sovereign debt crisis era. When expanding the board size, Balios and Zaroulea (2020), having used data from P.I.G.S., found a positive effect on corporate performance (ROA) measured as EBITDA (earnings before interest, taxes, depreciation and amortization) divided by total assets. Zhou et al. (2018) found that firms with larger and more independent member boards tend to outperform (as measured by ROA).

This paper investigates the association between board characteristics and firm performance. This study is prompted by contradicting findings in the literature. From one point of view, better-governed firms are supposed to have greater performance and higher valuation (Gompers et al., 2003). But, other researchers (Adams & Ferreira, 2007; Harris & Raviv, 2008; Khosa, 2017; Singh & Gaur, 2009) support that there is a negative relationship between board independence and company performance and value. Additionally, there are recent studies (Naimah & Hamidah, 2017; Mititean, 2022; Alodat et al., 2022) that support that each CG element has a different impact on company performance, either positively or adversely. This study explores how the board of directors (BoD) relates to performance in Greece, an emerging market where the board's monitoring and advisory functions can be critical for businesses. The primary goal of this research is to explore the effect of independent directors and female board members, CEO duality, and board size on firm performance. This study intends to contribute to the debate on the relationship between CG and corporate performance by analysing this relationship for Greece using four distinct CG elements. We utilize the same sample to analyse two distinct linear regressions, and the information we use to generate our measures is derived entirely from publicly available sources.

This paper's novelty is that we investigate the influence of CG on firm performance after the implementation of the 3693/2008 governance Law for all Greek listed firms. Also, this study uses two different performance models to assess the significance of board characteristics. Most studies have indicated that a strong CG framework is related with higher firm performance, hence the influence of CG variables on firm performance is likely to be positive. The above assumption is partially verified by this investigation. This study contributes to a better understanding of the influence of CG on business decision making by highlighting the repercussions of CG elements on firm performance.

The remainder of the paper is organized as follows. A review of the literature and development of hypotheses is presented in Section 2. The research methodology is presented in Section 3. The results of the data analysis and a detailed discussion are presented in Section 4. Section 5 highlights the study's conclusion, limitations, and future research suggestions.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Board characteristics

Corporate governance is commonly defined as an internal system encompassing policies, processes, and people that serve the needs of shareholders and other stakeholders by directing and controlling management activities with good business practices, objectivity, and integrity (O'Donovan, 2003). CG may alternatively be defined as a collection of procedures that safeguard outside investors from expropriation by insiders (La Porta et al., 2002). CG is intended to promote the interests of stakeholders by securing a reasonable return on capital and reducing asset misappropriation (Shleifer & Vishny, 1997).

Empirical literature indicates that firms with better CG practices outperform their competitors due to reduced agency costs and more effective monitoring mechanisms (Gompers et al., 2003; Brown & Caylor, 2006; Dittmar & Mahrt-Smith, 2007).

As an effective CG process, CG evaluation is offered by developing an opinion of the board of directors. Shareholders elect board members to work on their behalf, and the board transfer power to senior management while still evaluating management performance and confirming any move that shows a lack of good faith for shareholders. Shareholders can vote out and replace board members if they do not perform a good job of monitoring management's behaviour. Because common law countries are regarded to have stronger CG (Zhou & Chen, 2004) this paper focuses on board composition characteristics.

We explore the characteristics of the BoD, described below. An extended analysis of the way these characteristics form the whole CG frame has been made by Kalantonis et al. (2021).

Table 1. Control variables definition

Label	*Variable*	*Measurement*
IND	Independent members	The percentage of independent, outside, non-executive members on the board of directors of a firm.
BGD	Board gender diversity	The percentage of female members on the board of directors of a firm.
CEOD	CEO duality	The dummy variable taking the value of 1 if the role of CEO chairman is combined and 0 otherwise.
BS	Board size	The number of directors being appointed on a firm's board.

2.2. The impact of board characteristics on firms' performance

The impact of board's characteristics on corporate performance, measured by Tobin's Q and ROA, is consistent with prior studies (Demsetz & Lehn, 1985; Morck et al., 1988; Sarkar & Sarkar, 2000; Gompers et al., 2003; Klapper & Love, 2004; Brown & Caylor, 2006; Cheng, 2008; Guest, 2009; Jackling & Johl, 2009; Chen & Nowland, 2010; O'Connor et al., 2014). Nonetheless, the empirical results regarding the relationship between CG and company performance remain in doubt, owing to four factors: 1) the narrow view of measuring CG; 2) the country-specific context; 3) information provided by private rating agencies that is not publicly available; and 4) lack of corrections for the possibility of CG practices being endogenous (Hermes & Katsigianni, 2011). In this study, we test the significance of CG variables and more specifically, their effect on performance.

Considering board independence and firm performance, a few studies have positively linked the proportion of outside directors, financial success, and shareholder value (Rosenstein & Wyatt, 1990; Byrd & Hickman, 1992; Brickley et al., 1994; Subrahmanyan et al., 1997; Bonn, 2004). Other researchers have discovered an adverse association between board independence and firm performance (Agrawal & Knoeber, 1996; Singh & Gaur, 2009; Black et al., 2012; Erkens et al., 2012), while others have not (Fosberg, 1989; Bhagat & Black, 2003). Therefore, we test the following research hypothesis.

H1: There is a relationship between the percentage of independent members on the board of directors of a firm and the firm's performance.

Concerning the effect of women's participation on the improvement of company performance, researchers have provided evidence that female directors improve the board of directors' effectiveness and thus both performance and market value (Terjesen et al., 2016; Xie et al., 2018), or only performance (Erhardt et al., 2003; Krishnan & Park, 2005; Carter et al., 2010; Lückerath-Rovers, 2013; Isidro & Sobra, 2015), or only performance in the stock market (Carter et al., 2003). Other studies argue that women's presence on boards has a negative impact on corporate performance (Shrader et al., 1997; Adams & Ferreira, 2009) or did not find any significant linkage (Rose, 2007). Overall, we got controversial findings, thus we investigate the following research hypothesis.

H2: There is a relationship between the percentage of female members on the board of directors of a firm and the firm's performance.

Concerning the effect of CEO duality on performance, it has been argued that CEO duality leads to the unification of control and command, and hence higher performance, although the beneficial effect is diminished in enterprises with a large concentration of ownership (Gaur et al., 2015). However, empirical data does not appear to corroborate this notion, since most writers find no significant relationship (Bugshan, 2005; Davidson et al., 2005) or even a negative relationship (Alves, 2020). Smaller boards, it has been argued, are associated with better company performance and are less vulnerable to the CEO's influence (Yermack, 1997; Eisenberg et al., 1998; Ees et al., 2003), as problems such as information asymmetries, communication issues, and decision making generally occur. Therefore, we test the following research hypothesis.

H3: The fact that the role of the chairman and the CEO are vested in the same person affects the firm's performance.

Concerning the influence of board size on performance improvement, firms with larger boards are said to perform better because the size of the board allows the firm to develop external environmental links to secure key resources (Kiel & Nicholson, 2003). More board members will share ideas, talents, and experiences, resulting in the development of strategies to improve firm performance (Pearce & Zahra, 1992; Dallas, 2001; Abidin et al., 2009). The expenses of extending the board's membership outweigh the advantages (Jensen, 1993; Eisenberg et al., 1998; Vafeas, 2000; Ees et al., 2003; O'Connell & Cramer, 2010; Zabri et al., 2016). Contrary findings exist, indicating that additional board members with a wealth of ideas, skills, and experiences who might develop strategies to enhance firm performance (Dallas, 2001) or who typically reject the execution of extremely risky administrative actions (Yermack, 1997) are needed. A negative relationship between board size and corporate performance has also been discovered (Yermack, 1997; Conyon & Peck, 1998; Xie et al., 2003). Interestingly, there is no agreement on

the direction of the expected performance relationship as a function of board size, thus we investigate the following research hypothesis.

H4: There is a relationship between the board size of a firm and the firm's performance.

3. RESEARCH DESIGN

3.1. Sample selection

The sample includes enterprises listed on the ATHEX from 2008 to 2016 since the CG Code was implemented in Greece in 2008. Due to data availability limits and the listed corporations' obligatory disclosure obligations, we exclusively focus on publicly traded companies. For all the years covered by our sample period, the securities market had 151 businesses listed. We reduced the number to 125 by excluding firms from the banking, finance, assurance, and real estate sectors. Furthermore, because the sample is limited to enterprises having fiscal year-ends in December, four more firms were eliminated. Adding the requirement that data should be accessible for the independent and control variables used in the models has decreased the total to 113 firms. The exact number of observations is 1017. We limit our analysis to publicly traded companies due to data availability limits and mandated disclosure requirements. The major source for accounting and CG data was yearly balance sheets and financial statements and a complementary source was business websites. Finally, we do not employ rating agencies or questionnaire data. Following the availability of publicly disclosed CG data, we ended up utilizing the same sample as Kalantonis et al. (2021). However, because our goal is to investigate deeply how certain CG features impacted the economic position of Greek listed companies during the crisis, this article focuses on the dimension of financial performance, whereas the other paper explored the dimension of earnings management.

3.2. Methodological approach

As previously stated, the purpose of this paper is to determine whether different CG practices are associated with variations in firm performance. Following an overview of the empirical literature, we construct multidimensional measures of CG practices and apply them to assess the relationship between CG and corporate performance in the context of Greece. The use of various components of CG aids in the resolution of the multicollinearity problem. Many CG studies show a high correlation between CG variables (Klein, 2002; Xie et al., 2003). We also control for the possibility of endogeneity. Corporate performance may impact the quality of CG rather than the other way around (Black et al., 2006). Endogeneity could bias the obtained results (Campbell & Mnguez-Vera, 2008). In governance research, ordinary least squares (OLS) regression analysis might result in endogeneity between CG factors and other variables of relevance (Hermalin & Weisbach, 2003; Carcello et al., 2011). The presence of at least one source of endogeneity will skew the estimates and may result in spurious conclusions (Schultz et al., 2010).

In this work, a balanced panel data estimation is employed to analyse the data using linear, multivariate regression. Panel data analysis offers several advantages since it not only gives efficient and unbiased estimators but also provides a greater number of degrees of freedom for the estimate and helps the researcher to overcome the linear regression model's limiting assumptions.

According to the literature, reliance on a single performance indicator may be misleading due to limits in the use of accounting performance indicators, which can be manipulated, as well as changes in accounting and consolidation processes (Dalton et al., 1999). Furthermore, market-based measures of performance are said to be influenced by investors' expectations (Muller, 2014). Then we used two performance measures: accounting-based ROA and market-based Tobin's Q. The first demonstrates management efficiency in converting a company's assets into net earnings, while the second demonstrates a firm's success based on its growth potential (Hoon & Prather, 2001). The use of solely accounting measures of performance is subject to serious shortcomings stemming primarily from differences in systematic risk, tax legislation, and accounting conventions concerning inventory valuation, research and development (R&D) and advertising, and is likely to differ across industries, resulting in estimation bias in favour of industry effects (Singh & Newberry, 2008). As a result, Tobin's Q is a more realistic measure for analysing the market performance of enterprises in emerging countries, where capital markets are not as large and deep as in Anglo-Saxon countries (Ciftci et al., 2019).

To investigate the relationship between board characteristics and firm performance, we estimate a model in which firm performance is regressed on company-level governance major characteristics, following the approach used in previous studies (Demsetz & Lehn, 1985; Morck et al., 1988; Gompers et al., 2003; Klapper & Love, 2004; Brown & Caylor, 2006). We follow the literature to select our model's control variables (Balios & Zaroulea, 2020). Specifically, the variables in the following equations (except the control variables specified before) are presented in the table below.

Table 2. Variables' definition for performance models

Label	*Variable*	*Measurement*
FS	Firm size	LN of total assets
LIQ	Liquidity	Current assets to current liabilities
LEV	Leverage	Debt to total equity
INV	Inventory	LN inventory
REC	Receivables	LN receivables
CI	Capital intensity	Total book value of tangible assets to sales
OM	Operating margin	Operating income to sales

3.2.1. Model 1: Performance Model using ROA

ROA is the independent variable and is measured as EBIT divided by total assets. To test hypotheses *H1, H2, H3* and *H4* the following equation has been formed:

$$ROA_t = \alpha_0 + \alpha_1 FS_{i,t} + \alpha_2 LIQ_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 INV_{i,t} + \alpha_5 REC_{i,t} + \alpha_6 CI_{i,t} + \alpha_7 OM_{i,t} + \alpha_8 IND_{i,t} + \alpha_9 BGD_{i,t} + \alpha_{10} CEOD_{i,t} + \alpha_{11} BS_{i,t} + u_{i,t} \quad (1)$$

where, index *i* refers to the company; index *t* refers to the year; and $u_{i,t} = v_{i.t} + e_{i.t}$, with $v_{i.t}$ referring to the individual effects, and $e_{i.t}$ to the disruptive term.

3.2.2. Model 2: Performance Model using Tobin's Q

Tobin's Q is the independent variable, as a proxy of firm's performance, and is measured as market value divided by book value. To test hypotheses *H1*, *H2*, *H3* and *H4* the following equation has been formed:

$$Q_t = \alpha_0 + \alpha_1 FS_{i,t} + \alpha_2 LIQ_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 INV_{i,t} + \alpha_5 REC_{i,t} + \alpha_6 CI_{i,t} + \alpha_7 OM_{i,t} + \alpha_8 IND_{i,t} + \alpha_9 BGD_{i,t} + \alpha_{10} CEOD_{i,t} + \alpha_{11} BS_{i,t} + u_{i,t} \quad (2)$$

where, index *i* refers to the company, index *t* refers to the year, and $u_{i,t} = v_{i.t} + e_{i.t}$, with $v_{i.t}$ referring to the individual effects, and $e_{i.t}$ to the disruptive term.

3.3. Descriptive statistics

As the independent variables of the two models are the same, they have common descriptive statistics. In Table 3 below, we notice that the portion of independent board members varies from zero to 71.42% with a mean of 25.0% and a median of 28.5%. The portion of the female also varies from zero to 71.42%, with a mean of 14.08% and a median of 11.11%. Almost half of the examined firms trust the same person to be the chairman and the CEO simultaneously, while the minimum value of board members is 4 and the maximum is 15.

Table 3. Descriptive statistics

Variable	*Mean*	*Median*	*Min*	*Max*	*Std. deviation*
ROA	-0.018	-0.006	-1.028	0.543	0.085
Q	0.924	0.445	-21.332	35.321	2.066
FS	18.434	18.066	14.440	23.161	1.519
LIQ	1.626	1.283	0.096	70.887	2.482
LEV	0.660	0.777	-319.85	116.84	14.74
INV	15.587	15.664	4.388	21.194	2.128
REC	16.588	16.407	10.978	20.993	1.584
CI	1.692	0.899	0.010	105.73	4.911
OM	0.231	0.214	-9.446	0.969	0.402
IND	0.250	0.285	0	0.714	0.161
BGD	0.140	0.111	0	0.714	0.161
CEOD	0.433	0	0	1	0.495
BS	7.711	7	4	15	2.170

3.4. Correlation analysis

Pearson and Spearman's rank correlation coefficients are used to perform multicollinearity diagnostics. All values of any pair of independent variables should be substantially within the crucial range of 0.8, above which multicollinearity may jeopardize the regression findings (Gujarati, 2003, p. 359). The correlation matrix for both models is identical since the independent variables of the performance model using *ROA* and the performance model using *Tobin's Q* are the same.

Table 4. Correlation matrix of models

	FS	*LIQ*	*LEV*	*INV*	*REC*	*CI*	*OM*	*IND*	*BGD*	*CEOD*	*BS*
FS	1	0.020	0.034	0.573	0.083	-0.041	-0.044	-0.125	-0.186	-0.159	0.558
LIQ		1	-0.002	0.040	-0.011	-0.030	0.042	-0.059	-0.003	0.010	0.031
LEV			1	0.022	0.012	-0.033	0.123	-0.005	0.023	-0.034	0.003
INV				1	0.532	-0.178	-0.036	-0.050	-0.037	-0.053	0.303
REC					1	-0.128	-0.091	-0.080	-0.232	-0.149	0.469
CI						1	-0.598	0.044	0.007	-0.002	0.024
OM							1	-0.013	0.024	0.109	-0.071
IND								1	-0.014	0.131	-0.260
BGD									1	0.194	-0.181
CEOD										1	-0.248
BS											1

4. RESULTS AND DISCUSSION

To investigate the determinants of the impact of CG on firm's profitability, we utilised a linear regression model for panel data (Hsiao, 2003).

4.1. Discussing Model 1

To begin, we ran the five tests outlined below to conclude the appropriate regression model:

1. The Breusch-Pagan test cannot reject the null hypothesis that heteroskedasticity is not present, as X2(1) = 0.8169 with p-value = 0.3661 > 0.0001 and, therefore, we estimate that the simple pooled model is adequate.

2. The Hausman test rejects the null hypothesis that generalized least squares (GLS) estimates are consistent, with X2(11) = 37.4608 and p-value = 9.6433E-005 < 0.0001, indicating that a fixed effects model is preferred.

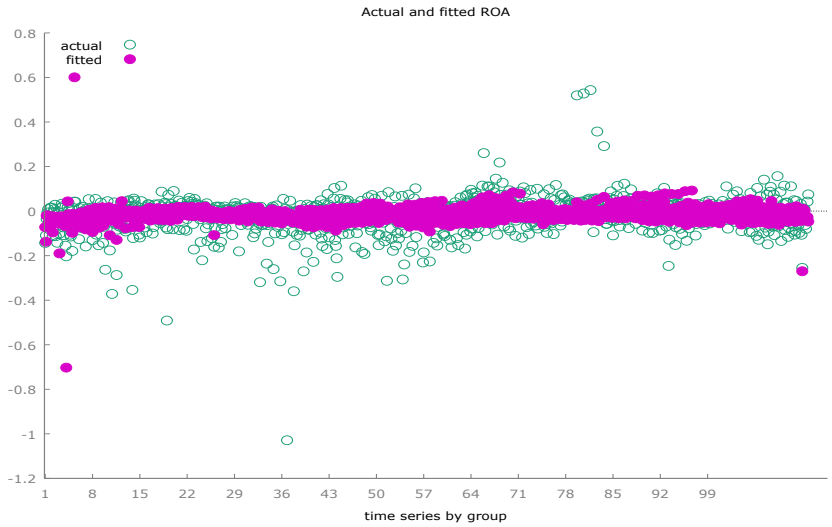
3. As a result, the F-test cannot reject the null hypothesis that all cross-sectional units have the same intercept, as F (112.893) = 1.1699 with p-value = 0.1219 > 0.0001 and the usage of a fixed effects model vs the equivalent OLS model was not verified.

4. We also find evidence of heteroskedasticity in residuals since White's test for heteroskedasticity rejects the null hypothesis that there is no heteroskedasticity, as Lagrange multiplier test (LM) = 164.625 with p-value = 1.72843E-008 < 0.0001.

5. The distribution-free Wald test for heteroskedasticity, which rejects the null hypothesis that the units share a similar error variance, yields the following asymptotic test statistic: X2(113) = 3419 with p-value = 0.

As a result, we used a weighted least squares (WLS) regression model with weights depending on per-unit error variances to investigate the determinants of CG on company profitability. Figure 1 depicts the real and fitted residual plots. The fitted residual plot looks much better since the variance of residuals is consistent over the whole range of fitted values.

Figure 1. Observation plot for actual and fitted *ROA*



Source: Authors' elaboration.

Table 5 illustrates the regression model's results. The regression model is statistically significant overall (F-statistic (11.1005) = 33.27996 with p-value = 1.23E-060 < 0.0001), implying that it interprets statistically a large portion of the variability of the dependent variable. The coefficient of determination (R^2) is 0.267001, and the related adjusted coefficient of determination (adjusted R^2) is 0.258978. According to the corrected coefficient of determination, the regression model explains 25.89% of the variability in the dependent variable. This percentage is quite satisfactory and confirms that enough relevant independent variables have been included in the model to analyse the changes in the dependent variable.

Table 5. Weighted least squares (WLS) regression model with dependent variable *ROA*

Variables	*Coefficient*	*St. error*	*t-ratio*	*p-value*	*Sign. level*
Const	-0.2616	0.02217	-11.80	< 0.0001	***
FS	0.00811	0.00234	3.471	0.0005	***
LIQ	0.00849	0.00112	7.604	< 0.0001	***
LEV	-0.00023	0.00015	-1.589	0.1123	
INV	-0.00176	0.00102	-1.722	0.0854	*
REC	0.00555	0.00215	2.578	0.0101	**
CI	-0.00084	0.00047	-1.766	0.0777	*
OM	0.05937	0.00650	9.132	< 0.0001	***
IND	-0.05051	0.01082	-4.668	< 0.0001	***
BGD	0.01499	0.01089	1.375	0.1693	
CEOD	0.01546	0.00360	4.291	< 0.0001	***
BS	0.00125	0.00097	1.292	0.1968	

Akaike criterion	2866.908	R-squared	0.267001
Schwarz criterion	2926.003	Adjusted R-squared	0.258978
Hannan-Quinn	2889.350	P-value (F)	1.23E-60

Note: WLS using 1017 observations. included 113cross-sectional units for a time-series length of 9 years.
**** 1% significance level, ** 5% significance level and * 10% significance level.*

The findings in Table 5 indicate that the proportion of independent board members (*IND*) has a negative and statistically significant influence on *ROA* [a = -0.05051, p < 0.0001]. The CEO duality (*CEOD*) has a statistically significant positive effect on ROA [a = 0.01546, p < 0.0001]. Female board members (*BGD*) and board size (*BS*) are both statistically insignificant. Six of the seven control variables included in the regression model (*FS, LIQ, INV, REC, CI,* and *OM*) demonstrated a statistically significant relationship with *ROA*. However, the impact of *LEV* is statistically insignificant.

4.2. Discussing Model 2

Working in the same way, we ran the same five tests to arrive at the best regression model:

1. The Breusch-Pagan test cannot reject the null hypothesis that heteroskedasticity is not present, as X2(1) = 0.0088 with p-value = 0.9249 > 0.0001, and, therefore, we estimate that the basic pooling model is adequate.

2. The Hausman test rejects the null hypothesis that GLS estimates are consistent, as X2(11) = 25.0697 with p-value = 0.0089 < 0.01, and a fixed effects model proved superior.

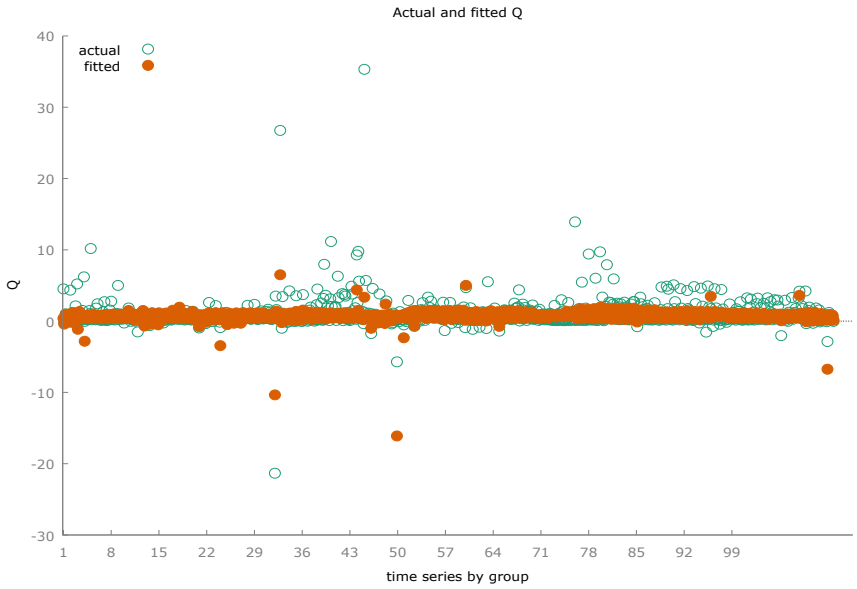
3. As a result, the F-test cannot reject the null hypothesis that all cross-sectional units have the same intercept, as F (112.893) = 1.0060 with p-value = 0.4683 > 0.0001, and the choice of a fixed effects model vs the equivalent OLS model was not justified.

4. We also find evidence of heteroskedasticity in residuals since White's test for heteroskedasticity rejects the null hypothesis that there is no heteroskedasticity, as LM = 525.524 with p-value = 2.16068E-068 < 0.0001.

5. Asymptotic test statistic: X2(113) = 46645 with p-value = 0, as does the distribution-free Wald test for heteroskedasticity, which rejects the null hypothesis that the units share a similar error variance.

As a result, we used a WLS regression model with weights based on per-unit error variances to study the determinants of CG on firm performance. Figure 2 depicts the real and fitted residual plots. The fitted residual plot is significantly more appealing since the variance of the residuals is constant across the whole range.

Figure 2. Observation plot for actual and fitted *Tobin's Q*



Source: Authors' elaboration.

The results of the regression model are presented in detail in Table 6. The regression model is statistically significant overall (F-statistic (11.1005) = 32.89017 with p-value = 5.76E-060 < 0.0001), which means it interprets statistically a substantial portion of the dependent variable's variability. The coefficient of determination (R^2) is 0.2647, whereas the corrected coefficient of determination (R^2) is 0.2566. According to the corrected coefficient of determination, the regression model explains 25.66% of the variability of the dependent variable. This percentage is quite satisfactory and certifies that the model has enough appropriate independent variables to investigate the changes in the dependent variable.

Table 6. Weighted least squares (WLS) regression model with dependent variable *Tobin's Q*

Variables	*Coefficient*	*St. error*	*t-ratio*	*p-value*	*Sign. level*
Const	0.12673	0.33741	0.3756	0.7073	
FS	0.25183	0.03542	7.110	< 0.0001	***
LIQ	0.00605	0.01614	0.3747	0.7080	
LEV	0.05227	0.00386	13.53	< 0.0001	***
INV	-0.06139	0.01626	-3.775	0.0002	***
REC	-0.22952	0.03182	-7.212	< 0.0001	***
CI	-0.02825	0.00549	-5.141	<0.0001	***
OM	0.02867	0.09055	0.3167	0.7516	
IND	-0.05671	0.15173	-0.3737	0.7087	
BGD	-0.23350	0.15331	-1.523	0.1281	
CEOD	0.23276	0.04992	4.663	< 0.0001	***
BS	0.07890	0.01329	5.934	< 0.0001	***

Akaike criterion	2753.275	R-squared	0.264702
Schwarz criterion	2812.370	Adjusted R-squared	0.256653
Hannan-Quinn	2775.717	P-value (F)	5.73E-060

*Note: WLS using 1017 observations. included 113cross-sectional units for a time-series length of 9 years. *** 1% significance level.*

The results in Table 6 indicate that the proportion of independent board members (*IND*) and the percentage of female board members (*BGD*) have no statistically significant influence on *Tobin's Q*. The CEO duality (*CEOD*), on the other hand, has a positive and statistically significant effect on ROA [a = 0.23276, p < 0.0001]. There is also a statistically significant and positive relationship between board size (*BS*) and *Tobin's Q* [a = 0.0789, p < 0.0001]. In terms of control variables, five of the seven in the regression model (*FS*, *LEV*, *INV*, *REC*, and *CI*) exhibited a statistically significant relationship with *Tobin's Q*. The effect of *LIQ* and *OM*, on the other hand, is statistically insignificant.

5. CONCLUSION

In accordance with prior literature, the analysis in this paper reveals that intense CG practices improve company performance, and CG factors are statistically significant. More specifically, we recognise a positive relationship between performance and the combined role of CEO and chairman in both models. Our research also confirms that businesses with larger boards outperform (Tobin's Q model) and that firms with more independent members perform poorly (ROA model). Furthermore, the control variables are shown to be significant, and we have two well-structured models since the modified coefficient of determination in each one decides that the regression model explains about 25% of the variability of the dependent variable.

Because the sample is the same as that utilized by Kalantonis et al. (2021), our investigation's limitations are the same, but they can be briefly discussed. The control variables used for this study were to be measurable and verifiable through the annual reports of the businesses. Certainly, the variables chosen are not exhaustive since additional variables might be employed. However, we did not utilize any other factors because data for most of the organizations in our sample were unavailable. We also have a data shortage for the time preceding the implementation of Law 3698/2008, which mandated all publicly traded companies to establish an audit committee. As a result, we cannot assess the CG influence on firm performance before, during, and after the Greek economic crisis. We should also point out that most of the corporations we analysed did not provide appropriate information concerning internal auditing, board committees, and qualitative features disclosures. This study contributes to the limited research in Greece on the relationship between CG and firm performance by providing empirical data on the influence of the most reported GC characteristics during the most recent Greek economic crisis.

REFERENCES

1. Abidin, Z., Kamal, N., & Jusoff, K. (2009). Board structure and corporate performance in Malaysia. *International Journal of Economics and Finance, 1*(1), 150–163. https://doi.org/10.5539/ijef.v1n1p150
2. Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics, 94*(2), 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007
3. Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. *Journal of Finance, 62*(1), 217–250. https://doi.org/10.1111/j.1540-6261.2007.01206.x
4. Agrawal, A., & Knoeber, C. R. (1996). Firm performance and mechanisms to control agency problems between managers and shareholders. *Journal of Financial and Quantitative Analysis, 31*(3), 377–397. https://doi.org/10.2307/2331397
5. Alodat, A. Y., Salleh, Z., Hashim, H. A., & Sulong, F. (2022). Corporate governance and firm performance: Empirical evidence from Jordan. *Journal of Financial Reporting and Accounting, 20*(5), 866–896. https://doi.org/10.1108/JFRA-12-2020-0361
6. Alves, S. (2020). CEO duality and firm performance: Portuguese evidence. In I. S. Paiva & L. C. Carvalho (Eds.), *Conceptual and theoretical approaches to corporate social responsibility, entrepreneurial orientation, and financial performance* (pp. 227–246). IGI Global. https://doi.org/10.4018/978-1-7998-2128-1.ch012
7. Balios, D., & Zaroulea, T. (2020). Corporate governance, internal audit and profitability: "Evidence from P.I.G.S. Countries". *Journal of Accounting and Auditing: Research & Practice, 2020*, Article 668702. https://doi.org/10.5171/2020.668702

8. Bhagat, S., & Black, B. S. (2003). *The non-correlation between board independence and long-term firm performance*. https://ssrn.com/abstract=313026
9. Black, B. S., Carvalho, A. G., & Gorga, E. (2012). What matters and for which firms for corporate governance in emerging markets? Evidence from Brazil (and other BRIK countries). *Journal of Corporate Finance, 18*(4), 934–952. https://doi.org/10.1016/j.jcorpfin.2011.10.001
10. Black, B. S., Kim, W., & Jang, H. (2006). Does corporate governance affect firm value? Evidence from Korea. *Journal of Law, Economics, & Organization, 22*(2), 366–413. https://doi.org/10.1093/jleo/ewj018
11. Bonn, I. (2004). Board structure and firm performance: Evidence from Australia. *Journal of Management & Organization, 10*(1), 14–24. https://doi.org/10.5172/jmo.2004.10.1.14
12. Brickley, J. A., Coles, J. L., & Terry, R. L. (1994). Outside directors and the adoption of poison pills. *Journal of Financial Economics, 35*(3), 371–390. https://doi.org/10.1016/0304-405X(94)90038-8
13. Brown, L. D., & Caylor, M. L. (2006). Corporate governance and firm valuation. *Journal of Accounting and Public Policy, 25*(4), 409–434. https://doi.org/10.1016/j.jaccpubpol.2006.05.005
14. Bugshan, T. (2005). *Corporate governance, earnings management, and the information content of accounting earnings: Theoretical model and empirical tests* [Doctoral Thesis, Bond University]. Bond Business School. https://pure.bond.edu.au/ws/portalfiles/portal/28897860/Bugshan_Thesis.pdf
15. Byrd, J., & Hickman, K. (1992). Do outside directors monitor managers? Evidence from tender offer bids. *Journal of Financial Economics, 32*(2), 195–221. https://doi.org/10.1016/0304-405X(92)90018-S
16. Campbell, K., & Minguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics, 83*, 435–451. https://doi.org/10.1007/s10551-007-9630-y
17. Carcello, J., Hermanson, D., & Ye, Z. (2011). Corporate governance research in accounting and auditing: Insights, practice implications, and future research directions. *Auditing: A Journal of Practice & Theory, 30*(3), 1–31. https://doi.org/10.2308/ajpt-10112
18. Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). 'The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review, 18*(5), 396–414. https://doi.org/10.1111/j.1467-8683.2010.00809.x
19. Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. *Financial Review, 38*(1), 33–53. https://doi.org/10.1111/1540-6288.00034
20. Chalevas, C. G. (2011). The effect of the mandatory adoption of corporate governance mechanisms on executive compensation. *The International Journal of Accounting, 46*(2), 138–174. https://doi.org/10.1016/j.intacc.2011.04.004
21. Chen, E., & Nowland, J. (2010). Optimal board monitoring in family-owned companies: Evidence from Asia. *Corporate Governance: An International Review, 18*(1), 3–17. https://doi.org/10.1111/j.1467-8683.2009.00778.x
22. Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics, 87*(1), 157–176. https://doi.org/10.1016/j.jfineco.2006.10.006
23. Chow, G. C. (2005). Role of planning in China's market economy. *Journal of Chinese Economic and Business Studies, 3*(3), 193–203. https://doi.org/10.1080/14765280500317866
24. Ciftci, I., Tatoglu, E., Wood, G., Demirbag, M., & Zaim, S. (2019). Corporate governance and firm performance in emerging markets: Evidence from Turkey. *International Business Review, 28*(1), 90–103. https://doi.org/10.1016/j.ibusrev.2018.08.004
25. Constantatos, A.-F. (2018). *Corporate governance mechanisms in Greece and their effect on earnings management and firm performance* [Doctoral Thesis, University of Stirling]. Stirling Online Research Repository. https://dspace.stir.ac.uk/handle/1893/28907
26. Conyon, M. J., & Peck, S. I. (1998). 'Board size and corporate performance: Evidence from European countries. *The European Journal of Finance, 4*(3), 291–304.https://doi.org/10.1080/135184798337317
27. Dallas, L. L. (2001). *Development in U.S. boards of directors and the multiple roles of corporate boards* (Research paper No. 48). School of Law, University of San Diego. https://ssrn.com/abstract=417242
28. Dalton, R. D., Daily, C. H., Johnson, J. L., & Ellstrand, A. E. (1999). Number of directors and financial performance: A meta-analysis. *Academy of Management Journal, 42*(6), 674–686. https://www.jstor.org/stable/256988
29. Davidson, R., Goodwin-Stewart, J., & Kent, P. (2005). Internal governance structures and earnings management. *Accounting & Finance, 45*(2), 241–267. https://doi.org/10.1111/j.1467-629x.2004.00132.x
30. Demsetz, H., & Lehn, K. (1985). The Structure of corporate ownership: Causes and consequences. *Journal of Political Economy, 93*(6), 1155–77. https://doi.org/10.1086/261354
31. Dittmar, A., & Mahrt-Smith, J. (2007). Corporate governance and the value of cash holdings. *Journal of Financial Economics, 83*(3), 599–634. https://doi.org/10.1016/j.jfineco.2005.12.006
32. Ees, H. V., Postma, T. J. B. M., & Sterken, E. (2003). Board characteristics and corporate performance in the Netherlands. *Eastern Economic Journal, 29*(1), 41–58. https://www.jstor.org/stable/40326457
33. Eisenberg, T., Sundgren, S., & Wells, M. T. (1998). Larger board size and decreasing firm value in small firms. *Journal of Financial Economics, 48*(1), 35–54. https://doi.org/10.1016/S0304-405X(98)00003-8
34. Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance: An International Review, 11*(2), 102–111. https://doi.org/10.1111/1467-8683.00011
35. Erkens, D. H., Hung, M., & Matos, P. (2012). Corporate governance in the 2007–2008 financial crisis: Evidence from financial institutions worldwide. *Journal of Corporate Finance, 18*(2), 389–411. https://doi.org/10.1016/j.jcorpfin.2012.01.005
36. Fosberg, R. H. (1989). Outside directors and managerial monitoring. *Akron Business and Economic Review, 20*(2), 24–32. https://www.proquest.com/docview/231162331/fulltextPDF
37. Gaur, S. S., Bathula, H., & Singh, D. (2015). Ownership concentration, board characteristics and firm performance: A contingency framework. *Management Decision, 53*(5), 911–931. https://doi.org/10.1108/MD-08-2014-0519
38. Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics, 118*(1), 107–156. https://doi.org/10.1162/00335530360535162
39. Guest, P. M. (2009). The impact of board size on firm performance: Evidence from the UK. *The European Journal of Finance, 15*(4), 385–404. https://doi.org/10.1080/13518470802466121

40. Gujarati, D. N. (2003). *Basic econometrics* (4th ed.). McGraw-Hill Companies. http://zalamsyah.staff.unja.ac.id/wp-content/uploads/sites/286/2019/11/7-Basic-Econometrics-4th-Ed.-Gujarati.pdf
41. Harris, M., & Raviv, A. (2008). A Theory of board control and size. *The Review of Financial Studies, 21*(4), 1797–1832. https://doi.org/10.1093/rfs/hhl030
42. Hermalin, B., & Weisbach, M. (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature. *FRBNY Economic Policy Review*, 9(1), 7–26. https://www.newyorkfed.org/medialibrary/media/research/epr/03v09n1/0304herm.pdf
43. Hermes, N., & Katsigianni, V. (2011). *Corporate governance and company performance: Evidence from Greece*. https://doi.org/10.2139/ssrn.1980331
44. Hoon, J., & Prather, L. J. (2001). Tobin's q, agency conflicts, and differential wealth effects of international joint ventures. *Global Finance Journal, 12*(2), 267–283. https://doi.org/10.1016/S1044-0283(01)00032-1
45. Hsiao, C. (2003) *Analysis of panel data* (2nd ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511754203
46. Isidro, H., & Sobral, M. (2015). The effects of women on corporate boards on firm value, financial performance, and ethical and social compliance. *Journal of Business Ethics, 132*(1), 1–19. https://doi.org/10.1007/s10551-014-2302-9
47. Jackling, B., & Johl, S. (2009). Board structure and firm performance: Evidence from India's top companies. *Corporate Governance: An International Review, 17*(4), 492–509. https://doi.org/10.1111/j.1467-8683.2009.00760.x
48. Jensen, M. C. (1993). The modern industrial revolution, exit and the failure of internal control systems. *Journal of Finance, 48*(3), 831–880. https://doi.org/10.1111/j.1540-6261.1993.tb04022.x
49. Kalantonis, P., Schoina, S., & Kallandranis, C. (2021). The impact of corporate governance on earnings management: Evidence from Greek listed firms. *Corporate Ownership & Control, 18*(2), 140–153. https://doi.org/10.22495/cocv18i2art11
50. Khosa, A. (2017). Independent directors and firm value of group-affiliated firms. *International Journal of Accounting & Information Management, 25*(2), 217–236. https://doi.org/10.1108/IJAIM-08-2016-0076
51. Kiel, G. C., & Nicholson, G. J. (2003). Board composition and corporate performance: How the Australian experience informs contrasting theories of corporate governance. *Corporate Governance: An International Review, 11*(3), 189–205. https://doi.org/10.1111/1467-8683.00318
52. Klapper, L. F., & Love, I. (2004). Corporate governance, investor protection, and performance in emerging markets. *Journal of Corporate Finance, 10*(5), 703–728. https://doi.org/10.1016/S0929-1199(03)00046-4
53. Klein, A. (2002). Economic determinants of audit committee independence. *Accounting Review, 77*(2), 435–452. https://doi.org/10.2308/accr.2002.77.2.435
54. Krishnan, H. A., & Park, D. (2005). A few good women: On top management teams. *Journal of Business Research, 58*(12), 1712–1720. https://doi.org/10.1016/j.jbusres.2004.09.003
55. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2002). Investor protection and corporate valuation. *The Journal of Finance, 57*(3), 1147–1170. https://doi.org/10.1111/1540-6261.00457
56. Lückerath-Rovers, M. (2013). Women on boards and firm performance. *Journal of Management Governance, 17*(2), 491–509. https://doi.org/10.1007/s10997-011-9186-1
57. Mititean, P. (2022). The impact of corporate governance characteristics on companies' financial performance: Evidence from Romania. *Economic Annals, 67*(233), 113–133. https://doi.org/10.2298/EKA2233113M
58. Morck, R., Shleifer, A., & Vishny, R. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics, 20*, 293–315. https://doi.org/10.1016/0304-405X(88)90048-7
59. Muller, V.-C. (2014). The impact of board composition on the financial performance of FTSE100 constituents. *Procedia — Social and Behavioral Sciences, 109*, 969–975. https://doi.org/10.1016/j.sbspro.2013.12.573
60. Naimah, Z., & Hamidah. (2017). The role of corporate governance in firm performance. *SHS Web of Conferences, 34,* Article 13003. https://doi.org/10.1051/shsconf/20173413003
61. O'Connell, V., & Cramer, N. (2010). The relationship between firm performance and board characteristics in Ireland. *European Management Journal, 28*(5), 387–399. https://doi.org/10.1016/j.emj.2009.11.002
62. O'Connor, T., Kinsella, S., & O'Sullivan, V. (2014). Legal protection of investors, corporate governance, and investable premia in emerging markets. *International Review of Economics & Finance, 29*, 426–439. https://doi.org/10.1016/j.iref.2013.07.003
63. O'Donovan, G. (2003, October 7). Change management — A board culture of corporate governance. *Mondaq.* https://www.mondaq.com/hongkong/operational-performance-management/22795/change-management--a-board-culture-of-corporate-governance
64. Pearce, J. A., & Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies, 29*(4), 411–438. https://doi.org/10.1111/j.1467-6486.1992.tb00672.x
65. Rose, C. (2007). Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review, 15*(2), 404–413. https://doi.org/10.1111/j.1467-8683.2007.00570.x
66. Rosenstein, S., & Wyatt, J. G. (1990). Outside directors, board independence and shareholder wealth. *Journal of Financial Economics, 26*(2), 175–191.https://doi.org/10.1016/0304-405X(90)90002-H
67. Sarkar, J., & Sarkar, S. (2000). Large shareholder activism in corporate governance in developing countries: Evidence from India. *International Review of Finance, 1*(3), 161–194. https://doi.org/10.1111/1468-2443.00010
68. Schultz, E. L., Tan, D. T., & Walsh, K. D. (2010). Endogeneity and the corporate governance-performance relation. *Australian Journal of Management, 35*(2), 145–163. https://doi.org/10.1177/0312896210370079
69. Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance, 52*(2), 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x
70. Shrader, C. B., Blackburn, V. B., & Iles, P. (1997). Women in management and firm financial performance: An exploratory study. *Journal of Managerial Issues, 9*(3), 355–373. https://dr.lib.iastate.edu/handle/20.500.12876/54440
71. Singh, D., & Gaur, A. (2009). Business group affiliation, firm governance and firm performance: Evidence from China and India. *Corporate Governance: An International Review, 17*(4), 411–425. https://doi.org/10.1111/j.1467-8683.2009.00750.x

72. Singh, R. D., & Newberry, S. (2008). Corporate governance and International Financial Reporting Standard (IFRS): The case of developing countries. In *Corporate governance in less developed and emerging economies* (Vol. 8, pp. 483–518). Emerald Group Publishing Limited. https://doi.org/10.1016/S1479-3563(08)08016-X
73. Subrahmanyan, V., Rangan, N., & Rosenstein, S. (1997). The role of outside directors in bank acquisitions. *Financial Management, 26*(3), 23–36. https://www.jstor.org/stable/3666211
74. Terjesen, S., Couto, E. B., & Francisco, P. M. (2016). Does the presence of independent and female directors impact firm performance? A multicountry study of board diversity. *Journal of Management & Governance, 20,* 447–483. https://doi.org/10.1007/s10997-014-9307-8
75. Vafeas, N. (2000). Board structure and the informativeness of earnings. *Journal of Accounting and Public Policy, 19*(2), 139–160. https://doi.org/10.1016/S0278-4254(00)00006-5
76. Xie, B., Davidson, W. N., & DaDalt, P. J. (2003). Earnings management and corporate governance: the role of the board and the audit committee. *Journal of Corporate Finance, 9*(3), 295–316. https://doi.org/10.1016/S0929-1199(02)00006-8
77. Xie, J., Nozawa, W., Yagi, M., Fujii, H., & Managi, S. (2018). Do environmental, social, and governance activities improve corporate financial performance? *Business Strategy and the Environment, 28*(2), 286–300. https://doi.org/10.1002/bse.2224
78. Yermack, D. (1997). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics, 40*(2), 185–211. https://doi.org/10.1016/0304-405X(95)00844-5
79. Zabri, S. M., Ahmad, K., & Wah, K. K. (2016). Corporate governance practices and firm performance: Evidence from top 100 public listed companies in Malaysia. *Procedia Economics and Finance, 35*, 287–296. https://doi.org/10.1016/S2212-5671(16)00036-8
80. Zhou, H., Owusu-Ansah, S., & Maggina, A. (2018). Board of directors, audit committee, and firm performance: Evidence from Greece. *Journal of International Accounting, Auditing and Taxation, 31*, 20–36. https://doi.org/10.1016/j.intaccaudtax.2018.03.002
81. Zhou, J., & Chen, K. Y. (2004). *Audit committee, board characteristics and earnings management by commercial banks.*