

# Board Composition and Firm Performance: Post-Financial-Crisis Evidence

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## Abstract

This paper examines whether corporate governance mechanisms are associated with the financial performance of non-financial firms listed on the Athens Stock Exchange (ASE) in 2019, the first full year after Greece's exit from its adjustment programs and the last pre-pandemic year. Extending crisis-period Greek evidence to the immediate post-crisis setting, 2019 is treated as a transitional post-crisis year in which firms had largely absorbed crisis-era governance reforms, yet their practical implementation and effects on outcomes still warranted empirical scrutiny. Using a cross-sectional sample of ASE-listed firms (financials excluded) and data drawn from 2019 annual reports, the paper examines whether board structure influences firm financial performance. The results indicate a significant association between governance and performance: board independence and the presence of female directors are positively related to performance, whereas CEO duality is negatively related. The findings are obtained using return on assets (ROA) as the performance measure and remain robust when performance is proxied by return on equity (ROE). By examining governance-performance associations in a country-specific setting during the immediate post-crisis period, this study extends the literature beyond crisis-period windows and offers practical implications: managers can prioritize and invest in board configurations associated with better performance, while regulators can use the evidence to refine rules that strengthen governance implementation and effectiveness.

## Keywords

Corporate Governance, Financial Performance, Board of Directors, Financial Crisis, Athens Stock Exchange

## 1. Introduction

This study investigates the relationship between corporate governance and the fi-

nancial performance of firms listed on the Athens Stock Exchange (ASE) in 2019, a period following the Greek sovereign debt crisis. A growing crisis-focused literature underscores why revisiting governance-performance links in turbulent periods is empirically valuable; recent studies examine the relationship between corporate governance and firm performance under financial stress (e.g., [Ahmad et al., 2023](#); [Mansour et al., 2022](#)). Examining this relationship at that juncture is of particular interest, as a “theoretically” developed national market within a euro area (EA) member state had been severely affected in the preceding years by a deep fiscal crisis, followed by a major financial crisis ([Kalemlı-Özcan et al., 2016](#)). This unprecedented episode attracted considerable scholarly attention, with studies focusing on its consequences and on the measures adopted to restructure the Greek financial system, as well as on the responses of non-financial corporations (e.g., [Kosmidou et al., 2015](#)). Beyond the operational and financial repercussions, the crisis also brought about significant changes in corporate governance practices. At the same time, Greece can also be viewed as “developing” country along certain structural dimensions ([Vadasi et al., 2021](#)), and the literature increasingly investigates governance-performance links in developing or emerging settings (e.g., [Abebe Zelalem et al., 2022](#); [Antwi et al., 2021](#); [Miao et al., 2023](#)) and the role of country-specific governance environments in shaping this relationship ([Wu, 2021](#)). Further, recent work underscores both the research salience of the Greek case during the crisis ([Tsiapa, 2022](#)) and the functioning of corporate-governance mechanisms in that period (e.g., [Arvanitis et al., 2022](#); [Kalantonis et al., 2022](#); [Vadasi & Polyzos, 2023](#)). Specifically, Greece exhibits concentrated ownership patterns, weaker institutional enforcement, and limited market discipline, dimensions that can condition how governance mechanisms map into performance.

This study connects directly to prior Greek evidence on corporate governance and performance during the crisis period. It relates to [Bekiaris \(2021\)](#), who analyzes how board structure relates to performance in Greek systemic banks over 2008-2018, and to [Kalantonis et al. \(2023\)](#), who examine listed firms on the Athens Stock Exchange over 2008-2016. Both studies focus on crisis-era conditions and document how board attributes map into performance in the Greek setting. The analysis extends this research agenda by shifting the lens to the immediate post-crisis year and by concentrating on non-financial ASE-listed firms in 2019, thereby assessing whether the crisis-era relationships persist, attenuate, or reverse once extraordinary conditions recede.

The choice of 2019 is deliberate and central to our contribution. It is the first full year after Greece’s exit from its economic adjustment programs (August 2018) and the last pre-pandemic year before large exogenous shocks (COVID-19, supply-chain disruptions, geopolitical tensions, inflation) reshaped corporate outcomes from 2020 onward. Studying 2019 allows us to isolate the legacy effects of the sovereign-debt crisis on governance-performance links without contamination by new global shocks, while also maintaining continuity with the time windows in [Bekiaris \(2021\)](#) and [Kalantonis et al. \(2023\)](#). In this sense, 2019 functions

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as a transitional post-crisis year, a pivotal point between the crisis decade and the subsequent shock-prone period, providing a clean setting to evaluate governance mechanisms in a country specific market.

Importantly, 2019 captures a transitional business and institutional environment. Firms had largely absorbed crisis-era reforms, yet these arrangements had not been “stress-applied” under new adverse conditions; the acceptance of new norms was broadly in place, but their practical implementation, maturation, and measurable impact on performance still required empirical scrutiny. The Greek crisis and its aftermath therefore operate as a natural stress test for corporate-governance theories (agency, resource dependence, stewardship) under tight credit, heightened regulatory oversight, macroeconomic uncertainty, and stronger transparency demands. This context, combined with crisis-era conditionality and supervisory scrutiny that effectively turn regulation into a quasi-experimental policy backdrop, offers evidence on the external validity of governance mechanisms. As the last pre-pandemic year, 2019 provides a clean benchmark with generalizable lessons for jurisdictions experiencing or exiting fiscal, banking, or confidence crises.

At the onset of the crisis, corporate governance in Greece was characterized by numerous laws, legislative acts, regulations, and regulatory decisions (e.g., Law 2190/1920; Law 3016/2002; Law 3601/2007; Law 3606/2007; Law 3864/2010), which, despite their complexity, generally conformed to contemporaneous corporate-governance requirements (Bekiaris, 2021; Nerantzidis & Filis, 2014). However, the effectiveness of these mechanisms was relatively weak compared with international standards (Lazarides & Drimpetas, 2011). Subsequent changes in corporate governance introduced stricter rules for the effective functioning of boards of directors (BoDs), a clear separation among executive, non-executive, and independent board members, and reinforced the independence of the chairpersons of key board committees.

The impact of corporate governance on the performance of firms and financial institutions has attracted considerable scholarly attention (e.g., Alodat et al., 2022; Assenga et al., 2018; Erena et al., 2022; Farooq et al., 2022; Johl et al., 2015; Sarwar et al., 2022; Terjesen et al., 2015). Against this backdrop, this study examines the relationship between corporate governance and the performance of firms listed on the ASE in a post-crisis period, thereby complementing existing research.

In brief, the evidence points to three core results: board independence and female representation are positively associated with firm performance, while CEO duality is negatively related. These patterns hold under a robustness check using ROE, with the independence effect even stronger, indicating that the findings are not proxy-specific.

The remainder of the paper is structured as follows. Section 2 reviews the related literature and develops the hypotheses. Section 3 describes the research design, sample, data collection, and model specification. Section 4 presents the empirical findings and discussion. Section 5 concludes, highlighting implications,

limitations, and avenues for future research.

## 2. Literature Review and Research Hypotheses

Over the past twenty-five years, corporate governance has emerged as a core theme in academic research, initially triggered by high-profile corporate scandals (e.g., Enron, Parmalat, WorldCom) and reinforced by the continuing demand for transparency and accountability. Beyond safeguarding shareholder interests (Shleifer & Vishny, 1997), a persistent question is whether governance structures translate into measurable effects on firm performance. Empirical studies document associations between governance features and economic outcomes (Alodat et al., 2022; Bhagat & Bolton, 2008; Bhagat & Bolton, 2019; Farooq et al., 2022), yet the evidence on specific mechanisms remains inconclusive. Scholars widely acknowledge that no single theoretical framework, whether agency, stewardship, or stakeholder theory, sufficiently captures the heterogeneity of findings (Kiel & Nicholson, 2003). In response, several authors advocate integrative perspectives that combine insights from multiple theories (Gaur et al., 2015; Rodriguez-Fernandez et al., 2014).

A common element in prior research is the emphasis on the significance for firm performance of board-related attributes such as board size, board independence, board diversity, board ownership, internationalization of the board, and potential conflicts arising from overlapping leadership roles. This study focuses on the effect of board composition on the performance of firms listed on the Athens Stock Exchange. In line with this literature, the study follows the variable design of Bekiaris (2021) for the banking sector during the crisis and examines a set of board characteristics largely overlapping with those in Kalantonis et al. (2023), with the distinction that the analysis also includes the presence of foreign directors. Accordingly, the literature links the following board characteristics to performance: 1) board size, 2) board independence, 3) board diversity (gender diversity), 4) board diversity (the presence of foreign directors), and 5) CEO duality.

**Board size.** The effect of board size on firm performance has been the subject of extensive empirical research, yet the evidence remains inconclusive. Larger boards may be beneficial by broadening the pool of expertise, increasing monitoring capacity, and facilitating access to external resources, thereby enhancing performance (Gaur et al., 2015; Johl et al., 2015). From a resource-dependence perspective, directors provide critical linkages to the external environment, and a more populated board can channel diverse knowledge and connections into strategic decision-making (Hillman & Dalziel, 2003; Pfeffer & Salancik, 1978). However, agency theorists caution that overly large boards risk coordination problems, slower decision-making, and diffusion of responsibility, thereby diminishing effectiveness (Jensen, 1993; Pathan & Faff, 2013).

Empirical findings reflect this theoretical ambiguity: some studies document a negative association between board size and performance (Guney, 2020; Miao et

al., 2023), whereas others report a significant positive effect (e.g., Abebe Zelalem et al., 2022; Kapil & Mishra, 2019). Given the conflicting results but drawing on the theoretical expectation that larger boards improve monitoring and resource access, the following hypothesis is formulated:

*H1: Board size is expected to have a positive association with firm performance.*

**Board independence.** The independence of the board of directors has long been regarded as a cornerstone of good governance, yet empirical evidence on its impact remains far from consistent. Several studies document a positive association between the proportion of independent directors and firm performance, highlighting their role in strengthening oversight and constraining managerial opportunism (Farooq et al., 2022; Kalantonis et al., 2023; Mansour et al., 2022; Miao et al., 2023; Shahrier et al., 2020). Other research, however, identifies either negative or insignificant effects: independence has been linked to lower performance in certain contexts (Gaur et al., 2015) and to statistically non-significant outcomes in others (Assenga et al., 2018; Erena et al., 2022; Johl et al., 2015). Systematic reviews likewise underscore this lack of consensus, particularly in emerging markets where institutional environments may shape the governance-performance nexus (Antwi et al., 2021). Despite these divergent findings, agency theory underscores the role of independent directors in strengthening monitoring and limiting managerial entrenchment, while corporate governance codes (e.g., IoD, 2016) reinforce this expectation by formally promoting greater board independence; these arguments support the following hypothesis:

*H2: A greater proportion of independent directors is anticipated to be positively related to firm performance.*

**Gender diversity.** A substantial body of research has examined whether board diversity affects firm outcomes, with much of the evidence indicating a positive association between diversity and financial performance (e.g., Assenga et al., 2018; Erhardt et al., 2003; Lückcrath-Rovers, 2011). Gender diversity has been a particularly prominent dimension of this debate. Adams and Ferreira (2009) argue that female directors can strengthen monitoring and improve board decision-making, thereby enhancing effectiveness. Terjesen et al. (2015) provide supporting evidence, showing that firms with higher female representation tend to perform better across both market-based (Tobin's Q) and accounting-based (ROA) indicators. More recent studies reinforce these findings in country-specific contexts. Arvanitis et al. (2022), examining firms listed on the Athens Stock Exchange, report a positive relationship between gender diversity and performance, and show that corporate outcomes are maximized once female participation reaches roughly one-third of board membership. Bekiaris (2021), analyzing Greek banks during the financial crisis, also identifies a significant positive impact of female directors on performance. Gordini and Rancati (2017), using Italian firms, further demonstrate that gender diversity measured through quantitative indices has a positive and significant effect on Tobin's Q, while the mere presence of one or more women directors without broader representation does not yield significant per-

formance effects. Sarhan et al. (2019) similarly conclude that the benefits of gender diversity are more pronounced in well-governed firms, underscoring its complementarity with other governance mechanisms. Based on the above arguments, the following hypothesis is proposed:

*H3: Higher female representation on the board is expected to be associated with superior firm performance.*

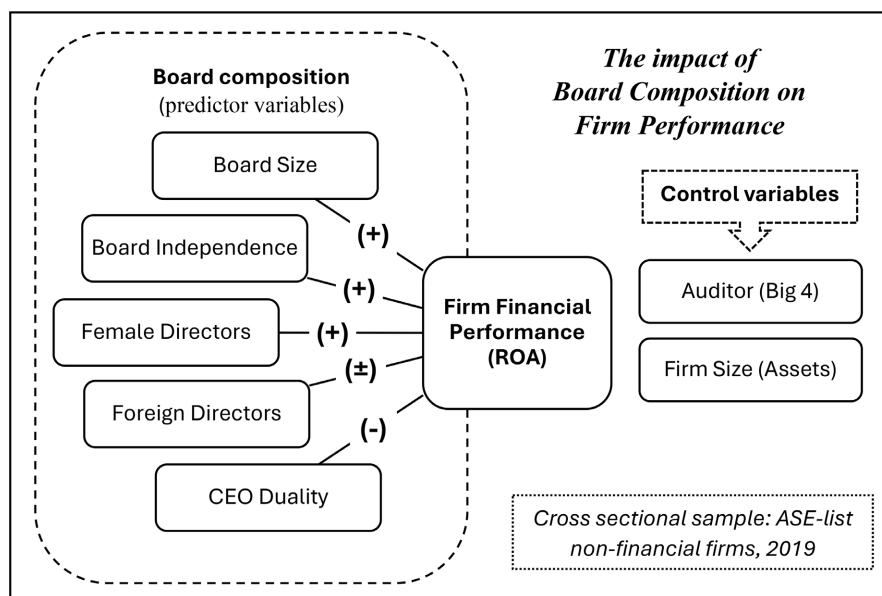
**Foreign directors.** Another salient dimension of board diversity concerns the appointment of foreign directors. Prior studies have reported mixed evidence, with some showing performance gains and others pointing to drawbacks or null effects (Assenga et al., 2018; Masulis et al., 2012; Oxelheim & Randøy, 2003). More recent evidence underscores the context-dependent nature of these effects. In the Greek banking sector, Bekiaris (2021) documents that foreign directors are negatively associated with bank performance, raising concerns about monitoring effectiveness. Oh et al. (2021), studying non-financial firms, show that firm value is affected by changes in the composition of foreign independent directors. Nguyen (2023) shows that foreign directors with strong expertise, experience, and networks are positively associated with firm performance; however, appointing additional foreign members does not necessarily enhance outcomes, as it may generate misunderstandings and slow down decision-making. Beyond purely financial metrics, Wu et al. (2024) find that foreign directors contribute positively to firms' ESG performance, highlighting their broader role in shaping corporate sustainability strategies. Given the conflicting findings, the following hypothesis is proposed:

*H4: Firm performance is either positively or negatively associated with the presence of foreign directors on the board.*

**CEO duality.** Stewardship theory posits that unifying the CEO and chair positions can concentrate authority, accelerate decision-making, and align managerial effort, thereby supporting effective governance (Donaldson & Davis, 1991). By contrast, most corporate governance codes caution that combining the two offices may undermine board independence and monitoring capacity; accordingly, they advocate role separation to mitigate agency risks and protect minority shareholders (HCGC, 2021; IoD, 2016). Empirically, the evidence is mixed: some work reports performance gains under CEO duality (e.g., Gaur et al., 2015) in line with stewardship theory, whereas several studies document penalties, consistent with agency-theoretic predictions. For example, Bhagat and Bolton (2008) find that CEO-chair separation is positively associated with operating performance (i.e., duality underperforms); Assenga et al. (2018) and Shahrier et al. (2020) report negative effects on ROA/ROE in Tanzania and Malaysia, respectively; Bekiaris (2021) shows a negative association between CEO duality and performance in the banking sector; Kapil and Mishra (2019) show that separated role of CEO and Chairman of board of directors is impacting all three performance measures, Tobin's Q, ROA and ROE, positively and significantly. Based on the above, the following hypothesis is proposed:

*H5: CEO duality is expected to be inversely related to firm performance.*

**Figure 1** summarizes the conceptual framework by mapping the research hypotheses (H1 to H5) and the expected signs for each predictor relative to firm financial performance: board size (+), board independence (+), female directors (+), foreign directors ( $\pm$ ), and CEO duality (-).



**Figure 1.** Conceptual framework.

### 3. Methodology and Research Design

#### 3.1. Research Setting and Sample Justification

The Greek business and institutional environment in 2019 remained transitional. By that time, firms had already absorbed the principal reforms introduced during the crisis years, yet these arrangements had not been “stress-applied” under new crisis conditions. Acceptance of new governance norms was broadly in place, but their practical implementation, maturation, and measurable impact on performance remained open empirical questions, making 2019 an informative window to observe outcomes after the dust had settled. The Greek crisis and its aftermath also operate as a natural stress test for corporate governance theories: agency-based monitoring, resource-dependence benefits from board human and social capital, and stewardship-oriented leadership all faced unusual pressures, including tight credit, heavier regulation and oversight, heightened uncertainty, and increased transparency demands. Testing whether the expected theory-to-performance channels continued to function in this setting, and with what sign and magnitude, informs the external validity of these mechanisms outside “normal times”.

Furthermore, crisis-era regulatory conditionality and supervisory scrutiny created a quasi-experimental policy backdrop that spurred upgrades and codification in governance practices. This raises the substantive question of practical impact:

did these changes translate into discernible shifts in board structure, managerial behavior, and disclosure/oversight quality that are observable in firm performance once extraordinary interventions receded? Finally, as the final pre-pandemic year, 2019 offers a useful benchmark with limited contamination from subsequent global shocks and lessons that may generalize to jurisdictions experiencing or emerging from fiscal, banking, or confidence crises. Positioning the analysis in 2019 also preserves comparability with the crisis-period windows examined by Bekiaris (2021) (2008-2018) and Kalantonis et al. (2023) (2008-2016) while shifting the focus to the immediate post-crisis year for listed non-financial firms.

### 3.2. Data and Sample Construction

The sample comprises 120 firms listed on the Athens Stock Exchange (ASE) for the fiscal year ending 31 December 2019. Data were hand-collected primarily from firms' 2019 annual reports and corporate governance statements (published in 2020). The sample excludes: 1) financial institutions (due to distinct business models and prudential/supervisory frameworks that may confound board-performance links), 2) firms under trading suspension, 3) firms with a non-December fiscal year-end, and 4) observations with missing data. **Table 1** reports the step-wise sample selection.

**Table 1.** Sample selection process.

	Firms
Population of Listed Firms on the Athens Stock Exchange in 2019	163
<i>Elimination:</i>	
1. Financial sector	11
2. Under trading suspension	12
3. Different financial statement reporting date	4
4. Missing data	16
<b>Final sample</b>	<b>120</b>

### 3.3. Empirical Model

The following cross-sectional regression model is estimated by ordinary least squares (OLS) for firm  $i$  in fiscal year 2019:

$$ROA_i = \beta_0 + \beta_1 BOARD_i + \beta_2 INDEP_i + \beta_3 FEMALE_i + \beta_4 FOREIGN_i + \beta_5 CEO_i + \beta_6 BIG4_i + \beta_7 \ln(ASSETS_i) + \varepsilon_i$$

where,  $ROA_i$  is return on assets (net income divided by total assets) for firm  $i$  in 2019;  $BOARD$  is board size (number of directors);  $INDEP$  is the proportion of independent directors (in %);  $FEMALE$  is the proportion of female directors (in %);  $FOREIGN$  is the proportion of foreign directors (in %);  $CEO$  equals 1 if the CEO also serves as board chair (duality), 0 otherwise;  $BIG4$  equals 1 if the firm is audited by a Big Four auditor (Deloitte, PwC, EY, or KPMG), 0 otherwise;  $\ln(ASSETS)$  is

the natural logarithm of total assets (firm size); and  $\varepsilon_i$  is the error term.

### 3.4. Variables and Measurement

The model combines corporate governance variables, specifically measures of board size and composition (predictor variables), with firm characteristics (control variables). The predictor variables were used to test the research hypotheses as outlined in Section 2. The control variables (*BIG4* & *ASSETS*) are based on prior literature and capture factors that may potentially influence firm performance. Firm size, typically proxied by total assets, is widely employed as a control variable in governance-performance models, although its impact on outcomes is not uniform across studies. For instance, [Farooq et al. \(2022\)](#) show that larger Pakistani firms derive stronger performance benefits from improved governance practices, while [Kalantonis et al. \(2023\)](#) document a positive association between firm size and Tobin's Q among Greek listed firms. In addition, audit quality, commonly captured by whether a firm is audited by a Big Four auditor, has been linked to superior transparency and financial outcomes. [Mansour et al. \(2022\)](#) incorporate Big Four affiliation as part of their governance quality index and find a positive association with firm performance, supporting its role as a relevant control factor. Although the literature frequently treats financial leverage as a key control in performance regressions, leverage was not included as a control variable because 2019, the first post-crisis year, still reflected atypical debt structures and adjustment legacies across Greek firms. Including leverage would risk capturing crisis-driven distortions rather than stable firm-level financing effects.

The dependent variable is *ROA* (return on assets), calculated as net income divided by total assets, an accounting-based profitability measure indicating how efficiently a firm utilizes its asset base. Board structure is proxied with five predictors: *BOARD* (board size, measured as the number of directors), *INDEP* (board independence, measured as the percentage of independent directors), *FEMALE* (gender diversity, the percentage of female directors), *FOREIGN* (board internationalization, the percentage of foreign directors), and *CEO* (a binary indicator equal to 1 if the CEO also serves as board chair, and 0 otherwise). Control variables include *BIG4* (indicator equal to 1 if the firm is audited by a Big Four auditor, 0 otherwise) and *ASSETS* (firm size, measured as the natural logarithm of total assets). Detailed definitions and measurement of all variables are reported in [Table 2](#).

### 3.5. Estimation Approach and Diagnostics

Ordinary least squares (OLS) regressions are estimated using heteroskedasticity-robust (HC) standard errors. Model significance is assessed with the overall F-statistic; multicollinearity is monitored via variance inflation factors (VIF). Descriptive statistics and pairwise correlations are reported to summarize distributions and bivariate associations. As a robustness check, we re-estimate the model using ROE as the dependent variable.

**Table 2.** Definition and measurement of variables.

Variable	Definition	Measurement
Dependent variable		
<i>ROA</i>	: Firm Performance	ROA (Return on Assets) = Net Income/Total Assets
Predictor variables		
<i>BOARD</i>	: Board Size	Total number of board of directors (BoD) members
<i>INDEP</i>	: Board Independence	Percentage of independent directors on the board
<i>FEMALE</i>	: Female Presence on the Board	Percentage of female directors on the board
<i>FOR-EIGN</i>	: Foreign Presence on the Board	Percentage of foreign directors on the board
<i>CEO</i>	: CEO Duality	Dummy variable equal to 1 if the CEO also serves as the board chairman, 0 otherwise
Control variables		
<i>BIG4</i>	: Audit Firm	Dummy variable equal to 1 if the firm is audited by one of the Big Four auditing firms, 0 otherwise
<i>ASSETS</i>	: Firm Size	Natural logarithm of the firm's total assets

Notes: The variables *INDEP*, *FEMALE*, and *FOREIGN* are expressed as percentages (0 - 100). Independent directors are defined in line with the criteria set by the Hellenic Corporate Governance Code, while *BIG4* indicates whether the statutory auditor of the firm for the fiscal year 2019 (published in 2020) belongs to one of the four largest international audit firms.

## 4. Results and Discussion

### 4.1. Descriptive Statistics

**Table 3** reports summary statistics for the dependent and explanatory variables for  $N = 120$  firm-year observations (2019). The distribution of performance (*ROA*) is clustered near zero (mean = 0.0016), with a slightly higher median (0.0100) and a broad range from  $-1.09$  to  $0.79$ . These figures indicate notable cross-firm variation and are consistent with several firms reporting losses in 2019.

Turning to board structure, boards are moderately sized on average (*BOARD*: mean = 7.73, median = 7, min-max = 4 - 16), while board independence clusters around one-third of seats (*INDEP*: mean  $\approx 32\%$ , median  $\approx 30.4\%$ , min-max = 0% - 90%), implying marked dispersion across firms. In terms of diversity, female representation averages 11.1% (*FEMALE*; median  $\approx 7.0\%$ , min-max = 0% - 50%), which, when combined with the typical board size, suggests that the *modal* board includes zero or one woman. Foreign directors are even less common on average (*FOREIGN*: mean  $\approx 6.3\%$ , median = 0%, min-max = 0% - 71.4%), indicating that at least half of the boards include no foreign members, though a subset of firms exhibits pronounced internationalization.

Regarding governance practices and firm characteristics, CEO duality (*CEO*) is prevalent in just over half of the sample (52% of firms), whereas only 22% are audited by a Big Four audit firm (*BIG4*). Firm size (*ASSETS*), measured as the natural logarithm of total assets, displays considerable dispersion (median  $\approx 4.37$ , min-max = 0.76 - 9.52), signaling wide variation in scale across listed non-financials. Together, these patterns point to significant cross-sectional heterogeneity in governance configurations and firm fundamentals, an aspect accounted for in the multivariate analysis that follows.

**Table 3.** Descriptive statistics results.

	ROA	BOARD	INDEP	FEMALE	FOREIGN	CEO	BIG4	ASSETS
<i>N</i>	120	120	120	120	120	120	120	120
Mean	0.0016	7.73	31.9854	11.0644	6.3218	0.52	0.22	4.6370
Median	0.0100	7.00	30.3846	6.9712	0.0000	1.00	0.00	4.3666
Variance	0.15580	2.218	18.52432	13.18639	16.11951	0.502	0.414	1.81276
Minimum	-1.09	4	0,00	0.00	0.00	0	0	0.76
Maximum	0.79	16	90.00	50.00	71.43	1	1	9.52

Notes: See **Table 2** for variable definitions and measurement.

## 4.2. Correlation Analysis

**Table 4** reports Pearson correlations among all variables. Firm performance (*ROA*) is significantly associated with board independence and female representation (positive) and with CEO duality (negative) at conventional levels, providing preliminary alignment with H2-H3 and H5.

Turning to associations among predictors, board size (*BOARD*) is significantly related to foreign directors (*FOREIGN*), CEO duality (*CEO*), audit firm (*BIG4*), and firm size (*ASSETS*). Board independence (*INDEP*) is significantly correlated with female representation (*FEMALE*) and CEO duality; female representation shows the same pattern. Foreign directors co-vary with board size, audit firm, and firm size, suggesting that more internationalized boards are more common in larger, Big Four-audited firms. Audit firm is in turn correlated with board size, foreign directors, firm size, and CEO duality. Taken together, these associations indicate non-trivial interdependencies among governance attributes and firm characteristics, which are addressed in the multivariate analysis. Importantly, pairwise correlations among regressors remain below conventional multicollinearity thresholds ( $|r| < 0.80$ ), so collinearity is unlikely to pose a material concern for our baseline specifications (Gujarati, 2003).

## 4.3. Regression Analysis

**Table 5** reports estimates from a multiple-regression model with *ROA* as the dependent variable and governance/firm controls drawn from the prior literature. The specification is jointly significant (Prob > F = 0.001), indicating that the

**Table 4.** Correlation results.

		ROA	BOARD	INDEP	FEMALE	FOREIGN	CEO	BIG4	ASSETS
<b>ROA</b>	Pearson	1	0.076	0.292	0.300	0.040	-0.331	0.081	0.085
	Sig.		0.407	0.001	<0.001	0.668	<0.001	0.381	0.357
<b>BOARD</b>	Pearson	0.076	1	-0.132	-0.015	0.337	-0.245	0.448	0.627
	Sig.	0.407		0.150	0.868	<0.001	0.007	<0.001	<0.001
<b>INDEP</b>	Pearson	0.292	-0.132	1	0.279	-0.090	-0.289	-0.134	-0.095
	Sig.	0.001	0.150		0.002	0.330	0.001	0.144	0.300
<b>FEMALE</b>	Pearson	0.300	-0.015	0.279	1	-0.017	-0.244	-0.082	-0.011
	Sig.	<.0001	0.868	0.002		0.850	0.007	0.375	0.901
<b>FOREIGN</b>	Pearson	0.040	0.337	-0.090	-0.017	1	-0.080	0.443	0.229
	Sig.	0.668	<0.001	0.330	0.850		0.384	<0.001	0.012
<b>CEO</b>	Pearson	-0.331	-0.245	-0.289	-0.244	-0.080	1	-0.179	-0.164
	Sig.	<0.001	0.007	0.001	0.007	0.384		0.050	0.074
<b>BIG4</b>	Pearson	0.081	0.448	-0.134	-0.082	0.443	-0.179	1	0.536
	Sig.	0.381	<0.001	0.144	0.375	<0.001	0.050		<0.001
<b>ASSETS</b>	Pearson	0.085	0.627	-0.095	-0.011	0.229	-0.164	0.536	1
	Sig.	0.357	<0.001	0.300	0.901	0.012	0.074	<0.001	
<b>N</b>	120	120	120	120	120	120	120	120	120

Notes: Entries are Pearson correlation coefficients. Two-tailed  $p$ -values are reported below each coefficient.  $N = 120$  for all pairs. All pairwise  $|r|$  among regressors are below 0.80; see VIFs in **Table 5**. Variables are defined in **Table 2**.

**Table 5.** Regression results.

Model	B	Std. Error	Beta	t	Sig.	Confidence Interval for B		Collinearity Statistics VIF
						Lower	Upper	
<b>(Constant)</b>	-0.061	0.070		-0.875	0.383	-0.200	0.077	
<b>BOARD</b>	1.420E-5	0.008	0.000	0.002	0.999	-0.016	0.016	1.866
<b>INDEP</b>	0.002	0.001	0.187	2.002	0.048*	0.000	0.003	1.213
<b>FEMALE</b>	0.002	0.001	0.202	2.240	0.027*	0.000	0.005	1.132
<b>FOREIGN</b>	7.012E-5	0.001	0.007	0.075	0.940	-0.002	0.002	1.304
<b>CEO</b>	-0.065	0.030	-0.210	-2.203	0.030*	-0.124	-0.007	1.261
<b>BIG4</b>	0.024	0.042	0.062	0.562	0.575	-0.059	0.106	1.716
<b>ASSETS</b>	0.003	0.010	0.035	0.298	0.766	-0.017	0.023	1.937

Notes: OLS estimates. Two-tailed  $p$ -values and 95% confidence intervals are reported. Model statistics: Prob > F = 0.001. Collinearity diagnostics: Variance inflation factors (VIF) are shown for each regressor, Mean VIF = 1.13; Max VIF = 1.94.  $N = 120$ . Significance: \* $p < 0.05$ , \*\* $p < 0.01$ . See **Table 2** for variable definitions and measurement; the dependent variable is ROA (net income ÷ total assets).

regressors have explanatory power for ROA in 2019. Collinearity diagnostics are comfortably low (mean VIF = 1.49, max VIF = 1.937), suggesting that the estimated coefficients are not distorted by multicollinearity.

The results lend support to H2 (*INDEP*) and H3 (*FEMALE*): both the proportion of independent directors and female representation on the board are positively associated with firm performance at the 5% level. Interpreted within the agency/resource-based lens developed in the literature review, these estimates imply that boards with a stronger independent component and greater gender diversity are associated with higher firm performance, even after conditioning on the other covariates included in the model. The signs also align with the bivariate evidence in **Table 4**, indicating that these associations persist once observed firm characteristics are controlled for.

Consistent with H5 (*CEO*), CEO duality is negatively related to ROA (5% level). This pattern is in line with the agency-theoretic concern that unifying the CEO and chair roles may weaken board oversight and, on average, be associated with lower firm performance. Again, the sign mirrors **Table 4** correlation and remains when the variables enter jointly.

In contrast, H1 (*BOARD*) and H4 (*FOREIGN*) are not supported in this cross-section. Turning to board size, **Table 5** likewise shows no statistically significant association with ROA, consistent with the mixed evidence in prior work and suggesting that simple headcount may obscure offsetting effects between expanded expertise/monitoring and higher coordination costs. With respect to foreign directors, **Table 5** does not indicate a statistically significant association with ROA. This is consistent with the mixed findings highlighted in the literature and may reflect that the simple share of foreign members does not capture the relevant dimensions (e.g., expertise, networks, or country-of-origin similarity) that could condition any performance effects.

#### 4.4. Discussion of Findings

Placing the results reported above in context, the positive association between ROA and board independence accords with prior evidence reporting beneficial effects of independent directors on firm outcomes (*Mansour et al., 2022; Shahrier et al., 2020*). This pattern is consistent with the agency-theoretic argument that a greater share of independent members enhances monitoring and board objectivity, thereby supporting stronger operating performance, and it is in line with recent evidence from Greece and other emerging markets (*Farooq et al., 2022; Kalantonis et al., 2023; Miao et al., 2023*).

Likewise, the positive association for female representation aligns with earlier work (*Assenga et al., 2018; Terjesen et al., 2015*) and mirrors recent Greek evidence showing performance gains and a critical-mass effect near one-third female participation (*Arvanitis et al., 2022*). The finding is also compatible with European evidence based on diversity indices (*Gordini & Rancati, 2017*) and sectoral results for Greek banks (*Bekiaris, 2021*), all pointing to performance-enhancing boards

when gender diversity is substantive rather than tokenistic.

By contrast, foreign directors do not emerge as a significant explanatory factor for ROA in this setting. This aligns with the mixed evidence in the literature and suggests that a simple headcount of foreign members may not capture the channels through which board internationalization matters, such as directors' expertise, networks, or similarity in levels of economic development (Nguyen, 2023; Oh et al., 2021). It is also notable that foreign directors have been linked to improvements in ESG rather than purely financial metrics in some contexts (Wu et al., 2024), underscoring that the relevant outcome margins may differ. In the Greek context, foreign directors are relatively uncommon and may at times be appointed for compliance or symbolic reasons rather than for specific expertise or strong international networks, which can help explain the absence of a measurable performance effect.

Finally, the negative association between CEO duality and ROA is consistent with the predictions advanced in the literature review (e.g., Assenga et al., 2018; Bekiaris, 2021; Shahrier et al., 2020) and with agency-theoretic concerns that combining the CEO and chair roles weakens board oversight. This stands in contrast to evidence of performance gains under duality in certain settings (Gaur et al., 2015), suggesting that institutional context and governance architecture condition the sign and strength of the relationship.

#### 4.5. Robustness Analysis

To ensure that the main results are not driven by the specific choice of performance metric, a robustness test was conducted by re-estimating the OLS model with Return on Equity (ROE) as the dependent variable instead of Return on Assets (ROA). The specification is jointly significant ( $\text{Prob} > F = 0.001$ ), indicating that the regressors have explanatory power for ROE in 2019. ROE captures profitability from the perspective of shareholders by relating net income to book equity and is widely used in governance-performance studies as a complementary accounting-based indicator (e.g., Kapil & Mishra, 2019; Shahrier et al., 2020).

The robustness specification (using ROE) yields results that are qualitatively consistent with the baseline (ROA) (see **Table 6**). Board independence (INDEP) and female representation (FEMALE) remain positively associated with performance, while CEO duality (CEO) remains negatively associated. Statistical significance is preserved at conventional thresholds: under ROE, independence attains 1% significance ( $p = 0.002$ ), whereas female representation and CEO duality are significant at the 5% level ( $p = 0.023$  and  $p = 0.010$ , respectively); under ROA, all three were significant at the 5% level. Thus, signs are unchanged and the independence effect is even stronger in the alternative specification, reinforcing the interpretation that greater board independence, enhanced gender diversity, and separation of CEO and chair roles are robustly linked to superior firm outcomes.

Other predictors, namely board size (*BOARD*), foreign directors (*FOREIGN*), audit firm (*BIG4*), and firm size (*ASSETS*), do not display significant associations

with ROE, in line with the null results obtained under the ROA specification. Importantly, the collinearity diagnostics confirm that multicollinearity is not a concern in the robustness model, as all VIF values remain comfortably below conventional thresholds. This consistency across alternative dependent variables strengthens confidence in the empirical evidence and supports the external validity of the conclusions.

Overall, the robustness analysis confirms that the main relationships documented in this study are not sensitive to the choice of accounting-based performance measure. Both ROA and ROE lead to the same substantive conclusions: independent and gender-diverse boards enhance firm performance, while CEO duality undermines it, whereas board size and foreign representation do not show detectable performance effects in the Greek post-crisis context.

**Table 6.** Robustness regression results (dependent variable: ROE).

Model	B	Std. Error	Beta	t	Sig.	Confidence Interval for B		Collinearity Statistics VIF
						Lower	Upper	
<b>(Constant)</b>	-0.077	0.098		-0.781	0.437	-0.271	0.118	
<b>BOARD</b>	0.005	0.011	0.048	0.438	0.662	-0.018	0.028	1.866
<b>INDEP</b>	0.003	0.001	0.281	3.155	0.002**	0.001	0.006	1.213
<b>FEMALE</b>	0.003	0.001	0.198	2.301	0.023*	0.000	0.006	1.132
<b>FOREIGN</b>	0.000	0.001	-0.011	-0.120	0.905	-0.003	0.002	1.304
<b>CEO</b>	-0.108	0.041	-0.236	-2.603	0.010*	-0.190	-0.026	1.261
<b>BIG4</b>	0.006	0.059	0.010	0.096	0.924	-0.111	0.122	1.716
<b>ASSETS</b>	-0.002	0.014	-0.014	-0.128	0.899	-0.030	0.026	1.937

Notes: OLS estimates. Two-tailed  $p$ -values and 95% confidence intervals are reported. Model statistics: Prob > F = 0.001. Collinearity diagnostics: Variance inflation factors (VIF) are shown for each regressor, Mean VIF = 1.13; Max VIF = 1.94. N = 120. Significance: \* $p < 0.05$ , \*\* $p < 0.01$ . See **Table 2** for variable definitions and measurement; the dependent variable is ROE (net income ÷ total equity).

## 5. Conclusion

This study examined whether board composition is associated with firm performance in a post-crisis, single-country setting. Using a hand-collected cross-sectional sample of 120 non-financial firms listed on the Athens Stock Exchange (ASE) in 2019, the first full year after Greece's exit from its adjustment programs and the last pre-pandemic year, OLS models were estimated of ROA on a set of board attributes and firm controls. By situating the analysis in 2019 as a transitional post-crisis year, the analysis isolates legacy effects of crisis-era reforms from subsequent global shocks and provides a clean benchmark for governance-performance links in the Greek market.

The empirical results are clear on three dimensions of board structure. First, board independence is positively related to performance, consistent with the view

that a stronger independent component enhances monitoring and board objectivity. Second, female representation on the board is positively associated with performance, aligning with arguments that gender-diverse boards deliberate more effectively and strengthen oversight. Third, CEO duality is negatively related to performance, in line with agency-theoretic concerns that combining the CEO and chair roles weakens the board's monitoring function. By contrast, board size and the share of foreign directors show no statistically significant association with ROA once other covariates are included. A robustness specification using ROE confirms the baseline patterns: signs are unchanged and the independence effect is even stronger (1% level), reinforcing the interpretation that these links are not proxy-specific.

These findings contribute to the literature in several ways. Conceptually, we extend crisis-period Greek evidence to the immediate post-crisis context, testing whether previously observed relationships persist once extraordinary conditions recede (Abebe Zelalem et al., 2022; Antwi et al., 2021; Miao et al., 2023; Wu, 2021). Empirically, the study provides country-specific, post-crisis evidence for ASE-listed non-financials, complementing prior Greek studies on banks and on listed firms conducted during the crisis decade (Bekiaris, 2021; Kalantonis et al., 2023). Substantively, the results identify the board levers most closely associated with firm performance in this environment, namely independence, gender diversity, and the separation of CEO and chair, while documenting null effects for board size and foreign representation once other factors are controlled. These results refine the map of governance mechanisms that appear most salient in the Greek market's transition out of crisis.

There are practical implications for policy and practice. For regulators and standard setters, the evidence is consistent with frameworks that promote board independence, encourage substantive female participation, and separate the CEO and chair roles to preserve board oversight. For boards and investors, the results suggest that board composition choices, in particular, increasing the independent share and building meaningful gender diversity, are associated with better operating performance, whereas simple expansion of headcount or the addition of foreign directors, per se, may not yield detectable gains in this setting. These recommendations are consistent with the 2021 Hellenic Corporate Governance Code (HCGC, 2021), which promotes board independence and includes provisions on gender diversity; our findings align with these provisions by linking them to superior firm outcomes.

This study is also subject to some limitations. First, the design is cross-sectional and single-year, which constrains causal inference and limits our ability to track dynamic adjustments or lagged effects. Second, the analysis is market-specific (ASE-listed, non-financial firms) and may not generalize to other institutional environments. Third, performance is proxied by accounting-based measures (ROA and ROE), which may not capture all dimensions of firm performance. Another limitation concerns potential endogeneity: for example, better-performing firms

may be more likely to attract independent or female directors, implying possible reverse causality that cannot be ruled out within the current cross-sectional design.

These limitations suggest several directions for future research. Panel analyses spanning multiple years (pre-, during, and post-crisis; pre- and post-governance-code updates) would allow researchers to assess dynamics, persistence, and policy effects. Other performance measures, such as market-based metrics (e.g., Tobin's Q), and non-financial outcomes (e.g., ESG), could show which aspects of performance are most affected by governance. Enriching governance measures (board tenure, expertise, committee structure, network centrality) could test mechanisms and boundary conditions, including potential non-linear/threshold effects in diversity variables. Finally, qualitative approaches, such as semi-structured interviews with directors and senior executives or structured surveys of board practices, could elicit complementary "soft" information (e.g., deliberation quality, informal influence, board dynamics) that is not observable in published filings and would enrich the interpretation of the quantitative results.

### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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