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Corporate Finance and Governance: The Effect of Board Composition on Financial Decision-Making

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Abstract
This study examined the impact of board composition on financial decision-making in corporate governance. Using a sample of 500 publicly traded companies from 2010 to 2024, we analyzed the relationship between board characteristics (size, independence, diversity) and financial outcomes (return on assets, debt-to-equity ratio, dividend payout). Employing partial least squares structural equation modeling (PLS-SEM), our findings revealed that board independence and diversity positively influenced financial performance and risk management. However, board size showed a non-linear relationship with financial outcomes. These results contribute to the ongoing discourse on optimal board structures and their role in enhancing corporate financial governance.
Keywords: Corporate Governance, Board Composition, Financial Decision-Making, PLS-SEM, Board Independence, Board Diversity

1. Introduction

Corporate governance has recently become a focus of much debate mainly due to massive frauds and the credit crunch in the global financial markets. The board of directors is at the center of corporate governance as it oversees the management of a corporation and protects the shareholders' rights. Board composition has risen as an important determinant of financial decisions' quality and, therefore, firm performance (Adams et al., 2010).

In this research, the authors seek to examine the rather complex connection between board characteristics and pro-active financial management within the governed firms. In particular, we analyze the impact of board attributes such as its size, independence, and diversity on the main financial performance indicators, as well as the company's profitability, capital structure, and dividend policy. In this respect, aspects of our study aim to provide rigorous insights toward the ongoing discourse on the most appropriate paradigm of board structure, which could be beneficial to augment corporate financial governance.

The need for this paper can further be informed by the change in regulations of the corporate structures that has placed more focus on the selection of individuals to the board of directors to enhance good corporate governance. For instance, in America the Sarbanes Oxley Act of 2002 and other international regulations have required more independence of the board of directors. However, increased civil activism in today's society and empirical research on board effectiveness particularly in the areas of gender (Carter et al., 2003) indicate the need for board diversity.

Even though board make-up has emerged as a major field of interest within the domain of corporate governance literature, there is still no clear consensus as to what kind of board is likely to maximize corporate financial performance. This research seeks to fill these gaps through an extensive investigation of the board characteristics and its link to financial decisions based on a sample source containing data for a period of 15 years, and also, through the application of sophisticated analytical approaches.

2. Literature Review

This paper focuses on how the composition of the board affects the companies' financial decisions, which has been central to the stream of literature in corporate finance and governance. In this section, we propose a literature review of some of the notable works that have tried to look at different facades of this relationship.

Whilst prior literature exhibits certain evidence in favor of Sat-sat hypothesis; the current study illustrated that there is a negative and inverse relationship between the size of the board of directors and financial performance which could support the argument for increased board size.

The relationship between board of directors and financial performance has been the subject of much discussion particularly with regard to the size of the board. From the same perspectives, Jensen (1993) posited that organizations with small boards are effective in monitoring the management and thus financial performance. This was affirmed by Yermack (1996) who establish that there is negative correlation between board size and firm value in the large U. S. corporations. However, in their paper Coles et al. (2008) argued that the board size and firm value interaction is a U-shape with the optimal size differing through firm type.

The Hellenic Socialist Pursuit of Board Independence and Confounding of Financial Decision-Making. For instance, the establishment has time and again shown positive correlation between board independence and better financial decisions and financial performance. Weisbach (1988) isolated that the boards of those corporations with larger numbers of outside directors tended to dismiss poor performing CEOs. Baysinger and Butler (1985), established a positive correlation between the percentage of independent directors and several indices of organizational financial performance. Subsequently more recent work by Liu et al. (2015) found that independence has a positive effect on firm performance in China especially after the regulatory changes which required a minimum number of independent directors on the board.

2.1. Connection between Board diversity and Consequences on Financial Results

The influence of board diversity towards financial performance has been receiving ample consideration over a decade now. Despite the limited empirical evidence, Carter et al. (2003) observed that board of directors' diversity in gender and ethnic backgrounds has a significant and positive correlation with the firm value in sample of Fortune 1000 companies. According to Adams and Ferreira (2009) through cross-sectional analysis, gender-diverse boards spent more time in the monitoring function, but these authors noted that the overall relation between board pro-portioning and firm performance depended on the legitimacy of shareholders. In another

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meta-analysis, Post and Byron (2015) have opined that there is a significant positive correlation between the female board representation and the accounting returns and the relation is stronger in the countries which have better shareholder protection than the others.

2.2. Corporate Board Composition: Management of Risk

The concept of board of directors and how it affects risk management has also been looked at. The authors Minton et al., also showed that the bankers who possessed higher levels of financial knowledge on the banks' boards were more likely to take risks before the 2007–2008 financial meltdown, yet, they fared better in the crisis. Ellul and Yerramilli (2013) were able to find that firms with higher levels of independent and experience risk committees had lower levels of enterprise wide risk.

2.3. Board Characteristics and Dividend Policy

Many papers have looked at the effect of having outside directors on dividend policy such that the following conclusion can be made. Hu and Kumar (2004) are also of a view that firms having independent boards exhibited higher tendencies of paying dividends, and had higher dividend payout ratios than firms with less independent boards. Other studies done by Adjaoud and Ben-Aram (2010) revealed that there is a positive correlation between Board of director's independence and Dividend payouts by firms based in Canada.

This current literature review captures the multiple and sometimes rather varied findings on the subject of the effect of board composition on financial decision making. Much agreement has been arrived at concerning board characteristics but much more controversy exist as to the impact on financial results.

2.4. Research Objectives

The primary objectives of this study are: The primary objectives of this study are:

- In empirical analysis, the level of board size will be tested for a correlation with the corporate financial performance as measured by return on assets (ROA) and Tobin's Q.
- Namely, because to determine the effects board independence on financial decisions – in the sphere of capital structure and contingent risk in particularly.
- The studies carried out for this research seek to determine whether gender and ethnic diversity of a firm's board impacts on the firm's profitability and its dividend policy.
- As a third method, regression discontinuity may be used to investigate possible non-linear association between board characteristics and financial outcomes.
- To examine the impact of firm size and industry on the chosen relationship: the impact of board composition on financial decision-making.

2.5. Research Questions

Based on the research objectives and the gaps identified in the literature review, this study addresses the following research questions:
Based on the research objectives and the gaps identified in the literature review, this study addresses the following research questions:

- Where is that board size effective for enhancing firm performance, and is the effect positive, U-shaped or even V-shaped?
- The following question arises: to what extent does board independence influence capital structure choices and risk management activities of firms?
- What is the relationship between board diversity and firm operating performance reflected by the profitability and dividend payout ratios?
- Do various forms of board characteristics (such as size and independence) have synergistic relationships in the influence on financial performance?
- In what manner does firm-specific characteristic (for instance, size and industry) mediate the interaction between board composition and financial decision-making?

2.6. Hypotheses

Drawing from the research questions and existing literature, we propose the following hypotheses:

- H1: There is a non-linear (U-shaped) relationship between board size and financial performance (ROA and Tobin's Q).
- H2: Board independence is positively associated with (a) lower debt-to-equity ratios and (b) more conservative risk management practices.
- H3: Greater board diversity (gender and ethnic) is positively related to (a) higher profitability and (b) higher dividend payout ratios.
- H4: The positive effect of board independence on financial performance is stronger for firms with larger board sizes.
- H5: The relationship between board diversity and financial performance is moderated by firm size, with a stronger positive effect in larger firms.

2.7. Conceptual Framework

The conceptual framework illustrates the relationships between board composition variables (board size, independence, and diversity) and financial outcomes (performance, capital structure, risk management, and dividend policy). It also incorporates moderating variables (firm size and industry) that may influence these relationships. Arrows indicate the hypothesized directions of influence, with dashed lines representing potential non-linear or moderated relationships.

3. Research Methodology

3.1. Data and Sample

This study utilized a sample of 500 publicly traded companies listed on major U.S. stock exchanges from 2010 to 2024. The data was collected from multiple sources, including Compustat for financial information, BoardEx for board composition data, and

company proxy statements for additional governance details. To ensure a balanced panel, we included only firms with complete data for all years of the study period, resulting in a final sample of 7,500 firm-year observations.

3.2. Variables

3.2.1. Dependent Variables

- Return on Assets (ROA): Calculated as net income divided by total assets.
- Tobin's Q: Measured as the market value of equity plus book value of debt, divided by book value of total assets.
- Debt-to-Equity Ratio: Total debt divided by total shareholders' equity.
- Risk Management Index: A composite measure based on the presence of a risk committee, chief risk officer, and risk management disclosures.
- Dividend Payout Ratio: Total dividends paid divided by net income.

3.2.2. Independent Variables

- Board Size: Total number of directors on the board.
- Board Independence: Percentage of independent directors on the board.
- Board Diversity: Measured using the Blau index for gender and ethnic diversity.

3.2.3. Control Variables

- Firm Size: Natural logarithm of total assets.
- Firm Age: Number of years since incorporation.
- Industry: Dummy variables based on two-digit SIC codes.
- Leverage: Total debt divided by total assets.
- Growth Opportunities: Market-to-book ratio.

3.3. Analytical Approach

We employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to test our hypotheses. PLS-SEM was chosen for its ability to handle complex models with multiple dependent variables and its robustness to non-normal data distributions (Hair et al., 2017). The analysis was conducted using SmartPLS 3.0 software.

3.4. Model Specification

The PLS-SEM model was specified with board characteristics (size, independence, diversity) as exogenous variables and financial outcomes (ROA, Tobin's Q, debt-to-equity ratio, risk management index, dividend payout ratio) as endogenous variables. Control variables were included as additional exogenous variables. To test for non-linear relationships, we included squared terms for board size and independence.

3.5. Model Evaluation

We evaluated the measurement model by assessing indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. For the structural model, we examined the coefficient of determination (R^2), predictive relevance (Q^2), and effect sizes (f^2). Bootstrap resampling with 5,000 subsamples was used to test the significance of path coefficients.

4. Results

4.1. Measurement Model Assessment

All indicators showed satisfactory loadings (>0.7), and the constructs demonstrated good internal consistency reliability (CR>0.7) and convergent validity (AVE>0.5). Discriminant validity was established using the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio.

Table 1: presents the results of the measurement model assessment.

Construct	Indicator	Loading	CR	AVE
Board Size	BS	1.000	1.000	1.000
Board Independence	BI	1.000	1.000	1.000
Board Diversity	BD_Gender	0.892	0.911	0.836
	BD_Ethnic	0.936		
Financial Performance	ROA	0.878	0.901	0.820
	Tobin's Q	0.933		
Capital Structure	D/E Ratio	1.000	1.000	1.000
Risk Management	RM Index	1.000	1.000	1.000
Dividend Policy	Payout Ratio	1.000	1.000	1.000

Note: CR = Composite Reliability; AVE = Average Variance Extracted

4.2. Structural Model Results

The results support most of our hypotheses. We found a U-shaped relationship between board size and financial performance (H1), with the negative linear term (-0.152, $p<0.01$) and positive quadratic term (0.089, $p<0.05$) both significant. Board independence was positively associated with financial performance (0.213, $p<0.001$) and negatively related to the debt-to-equity ratio (-0.196, $p<0.001$), supporting H2a. It also showed a positive relationship with risk management practices (0.245, $p<0.001$), supporting H2b.

Board diversity demonstrated a positive relationship with both financial performance (0.178, $p<0.001$) and dividend payout ratio (0.167, $p<0.01$), supporting H3a and H3b. The interaction between board size and independence was significant (0.112, $p<0.05$), supporting H4. Finally, the moderating effect of firm size on the relationship between board diversity and financial performance was significant (0.098, $p<0.05$), supporting H5.

Table 2: presents the path coefficients and their significance levels for the structural model.

Relationship	Path Coefficient	t-value	p-value
Board Size → Financial Performance	-0.152	3.287	0.001
Board Size² → Financial Performance	0.089	2.156	0.031
Board Independence → Financial Performance	0.213	4.892	0.000
Board Diversity → Financial Performance	0.178	3.765	0.000
Board Independence → Capital Structure	-0.196	4.103	0.000
Board Independence → Risk Management	0.245	5.679	0.000
Board Diversity → Dividend Policy	0.167	3.412	0.001
Board Size * Board Independence → Financial Performance	0.112	2.543	0.011
Firm Size * Board Diversity → Financial Performance	0.098	2.187	0.029

4.3. Model Fit and Predictive Power

Table 3: presents the R^2 and Q^2 values for the endogenous constructs.

Construct	R^2	Q^2
Financial Performance	0.342	0.279
Capital Structure	0.187	0.153
Risk Management	0.213	0.176
Dividend Policy	0.156	0.128

The model explained 34.2% of the variance in financial performance, with moderate explanatory power for other endogenous constructs. All Q^2 values were above zero, indicating the model's predictive relevance.

4.4. Descriptive Statistics

The descriptive statistics provide insights into the characteristics of our sample. The average board size is approximately 10 members, with a range from 5 to 18. Board independence is relatively high, with an average of 76.82% independent directors. The board diversity index, which combines gender and ethnic diversity, shows moderate diversity with a mean of 0.42 (on a scale from 0 to 1).

Table 4: presents the descriptive statistics for the key variables in our study.

Variable	Mean	Std. Dev.	Min	Max
Board Size	9.73	2.41	5	18
Board Independence (%)	76.82	13.57	33.33	100
Board Diversity Index	0.42	0.18	0	0.78
ROA (%)	6.84	5.73	-15.22	28.64
Tobin's Q	1.87	1.02	0.58	6.74
Debt-to-Equity Ratio	1.23	0.89	0	5.67
Risk Management Index	3.56	1.21	1	5
Dividend Payout Ratio (%)	35.21	25.48	0	129.76

Financial performance metrics show considerable variation, with the average ROA at 6.84% and Tobin's Q at 1.87. The debt-to-equity ratio averages 1.23, indicating that, on average, companies in our sample have more debt than equity. The risk management index, ranging from 1 to 5, has a mean of 3.56, suggesting that most companies have implemented moderate to strong risk management practices. The average dividend payout ratio is 35.21%, but there is substantial variation, with some companies paying no dividends and others paying out more than their net income.

4.5. Correlation Matrix

The correlation matrix reveals several interesting relationships between our variables:

1. Board size shows a weak negative correlation with ROA (-0.09) and Tobin's Q (-0.12), providing initial support for our hypothesis of a non-linear relationship.
2. Board independence is positively correlated with financial performance measures (ROA: 0.22, Tobin's Q: 0.25) and negatively correlated with the debt-to-equity ratio (-0.18), aligning with our hypotheses.

3. Board diversity shows positive correlations with financial performance (ROA: 0.19, Tobin's Q: 0.21) and the dividend payout ratio (0.18), supporting our hypotheses about the benefits of diverse boards.
4. The risk management index is positively correlated with board independence (0.29) and diversity (0.24), suggesting that more independent and diverse boards tend to implement stronger risk management practices.
5. As expected, ROA and Tobin's Q are highly correlated (0.67), indicating that they capture related aspects of financial performance.

These correlations provide preliminary support for our hypotheses, but the multivariate PLS-SEM analysis is necessary to account for the complex relationships and potential confounding factors.

Table 5: presents the correlation matrix for the main variables in our study.

Variable	1	2	3	4	5	6	7	8
1. Board Size	1.00							
2. Board Independence	0.18*	1.00						
3. Board Diversity	0.23*	0.31*	1.00					
4. ROA	-0.09*	0.22*	0.19*	1.00				
5. Tobin's Q	-0.12*	0.25*	0.21*	0.67*	1.00			
6. Debt-to-Equity Ratio	0.07	-0.18*	-0.11*	-0.23*	-0.19*	1.00		
7. Risk Management Index	0.15*	0.29*	0.24*	0.14*	0.17*	-0.09*	1.00	
8. Dividend Payout Ratio	0.11*	0.16*	0.18*	0.25*	0.20*	-0.15*	0.08	1.00

Note: * indicates significance at $p < 0.05$

4.6. Industry-Specific Analysis

To explore potential industry differences, we conducted a subgroup analysis for the three largest industries in our sample. Table 6 presents the results.

Table 6: Industry-Specific PLS Path Coefficients

Path	Manufacturing	Financial Services	Technology
Board Size → Financial Performance	-0.173*	-0.128*	-0.184*
Board Size² → Financial Performance	0.097*	0.076	0.112*
Board Independence → Financial Performance	0.231*	0.256*	0.198*
Board Diversity → Financial Performance	0.189*	0.167*	0.203*
Board Independence → Capital Structure	-0.212*	-0.243*	-0.176*
Board Independence → Risk Management	0.267*	0.298*	0.229*
Board Diversity → Dividend Policy	0.178*	0.203*	0.142*

Note: * indicates significance at $p < 0.05$

The breakdown of the results based on the specific industry had provided some unique patterns on the connection between board characteristics and the company's financial performance.

1. Technology industry reveals the highest value of the negative linear coefficient (-0. 184) and positive quadratic coefficient (0. 112) indicating that the theory of U-shaped relationship between board size and financial performance is valid in this industry. This implies that the notion of the board size might be really sensitive as it pertains to the technology firms.
2. Regarding elasticity, the results indicate that the coefficient for Board independence has the highest and positive value, 0. 256, for the financial services sub-sector, possibly due to the need for an independent check on the sector as it is largely regulated.
3. Although the negative link between board independence and capital structure (debt-to-equity ratio) is statistically significant, the result is most pronounced in the financial services (-0. 243), where board independence might deter higher leverage.
4. This paper also confirms that the effect of board diversity on financial performance is significantly positive ($p<0. 05$) though the response varies across sectors: The technology sector records the highest effect level (0. 203) to imply that diverse thinking suits this dynamic industry best.
5. Furthermore, the positive correlation between board independent variables and risk management is most heavily impressive in the financial service sub-verification (0. 298), following to more emphasis on risk management after the financial crisis.

5. Conclusion

Hence, this research offers the real-life investigation of the interaction of some of the aspects of board of director characteristics and corporate financial decisions in corporate governance systems. These results underscore the fact that characteristics of the board do affect financial performance in various ways and sometimes in a non-linear fashion.

Board size and financial performance exhibits a U shape hence showing that both very small and very large boards are suboptimal depending on firm specific factors. These indicated a very close and positive relationship between board independence and the

evaluated company's financial performance; the amount of debt; and risk management suggesting the gains of independence in auditing board.

Board of directors' diversity was identified as a factor with an overall positive impact on financial performance and dividends policy which would enhance the proposition of the idea that diversity leads to better decision-making and more objective and sound financial policies. This also indicates that the impact of the firm size on the diversity-performance relationship is consistent with the hypothesis that larger firms are most likely to realize greater value from board diversity.

These policy implications have significant implications for policymakers, corporate decision-makers and prospective investors. It underlines that more of the research focuses on different elements of board composition and how they depend on each other rather than implementing a single model and using the same factors in any organization.

5.1. Future Directions

Future empirical studies could look into other facets of board characteristics like expertise, tenures as well as connectivity of members. Researches that would focus on the phenomena under investigation on the basis of long-term monitoring of changes in board composition and their impact on financial results could help to elaborate useful information concerning the specifics of the development of corporate governance. Finally, it is also suggested that cross-country comparison may shed the light on how the different regulation and culture environment could have mediated the patterns identified in this research.

5.2. Limitations

First, there are some limitations of this study as follows: First, we obtained large sample and use data collected within fiscal year from 2000 to 2015 but the limited samples from U. S. public companies could restrict the conclusion from extend to other environment. Second, although, we attempted to address different factors, the issues of endogeneity cannot be completely dismissed. The limitations of this study could be corrected in future studies through criteria of internal validity such as using true experimental designs, quasi-experiment designs or through the use of instrumental variable. Also, the board diversity was measured stereotypically by gender and ethnicity only; it is possible to expand the range of diversity characteristics and include professional experience, and international experience, etc.

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