Proceedings of Book Series PBS -Vol 43, pp.39-44 Emerging Approaches in Modern Business

The Effect of Board Characteristics on Risk Management: Toward an Integrated Model

Maryem Fadhli[1], Soulef Smaoui[2]

Department of Management Sciences, University of Sfax
Faculty of Economics and Management of Sfax, University of Sfax, Tunisia

1 maryem.fadhli@fsegs.usf.tn
2 soulef.smaoui@fsegs.usf.tn

***Abstract*— This study examines the extent to which board characteristics contribute to the effectiveness of risk management, as captured through environmental, social, and governance (ESG) controversies. Drawing on agency theory and resource dependence theory, we jointly investigate six board characteristics: board size, CEO-duality, gender diversity, board independence, directors' academic background, and board experience. The empirical analysis is based on an international panel of 234 firms from 14 countries observed over the 2015-2025 period, using data obtained from Refinitiv DataStream. The findings indicate that all six board characteristics are positively and significantly associated with more effective management of ESG controversies. These results highlight the complementarity between the board's monitoring function and the cognitive, professional, and relational resources provided by its members. This study contributes to the literature by advancing an integrated perspective on risk governance and provides relevant implications for firms, investors, and regulators.**

***Keywords*— corporate governance, board characteristics, ESG controversies, risk management.**

I. INTRODUCTION

The intensification of financial, operational, climate-related, technological, and regulatory risks has made risk management a strategic priority for firms. In this context, ESG controversies represent a particularly relevant manifestation of potential deficiencies in the management of non-financial risks. Unlike ESG indicators that are primarily based on disclosed policies and commitments, ESG controversies reflect actual adverse events and therefore provide a more direct assessment of firm's exposure to environmental, social, reputational, and governance risks [1].

The board plays a pivotal role in this process by setting strategic directions, overseeing management, and monitoring the mechanisms used to identify, assess, and address risks. However, the existing literature remains fragmented. It often examines the structural characteristics of the board in isolation and devotes less attention to the combined contribution of its demographic, cognitive, and professional dimensions.

This study therefore addresses the following research question: **To what extent do the structural and human characteristics of the board of directors enhance the effectiveness of ESG controversy management?** We jointly examine board size, CEO duality, gender diversity, board independence, directors' academic background, and board experience.

Our study makes three main contributions. First, it shifts the focus from disclosed ESG performance to the management of ESG controversies, which more directly reflects the materialization of non-financial risks. Second, it adopts an integrated perspective by combining the structural characteristics of the board with its human capital. Third, it brings together agency theory and resource dependence theory to better explain the board's complementary monitoring, advisory, and resource-provision functions.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

agency theory views the board of directors as a governance mechanism designed to reduce conflicts of interest between managers and stakeholders [5]. Effective board monitoring should therefore constrain opportunistic managerial behaviour that may increase the firm's exposure to ESG controversies.in parallel, resource dependence theory emphasizes that directors provide the firm with valuable knowledge, expertise, networks, and strategic resources that are essential for identifying and addressing complex risks [6].

Copyright © 2026
ISSN: 2961-6611

Proceedings of Book Series PBS -Vol 43, pp.39-44 **Emerging Approaches in Modern Business**

A larger board may bring together a broader range of skills and experience, thereby strengthening its monitoring and advisory capabilities. In particular, [8] show that board characteristics influence the adoption of environmental objectives.

H1. Board size has a positive effect on the effective management of ESG controversies.

CEO-chair duality is a more controversial board characteristic. While the concentration of power may theoretically weaken the independence of oversight, it may also improve coordination between strategic and operational decisions and accelerate organizational responses during periods of crisis. Accordingly, some studies identify a positive association between CEO duality and sustainability outcomes [3].

H2. CEO duality has a positive effect on the effective management of ESG controversies.

Gender diversity enhances the cognitive diversity of the board and may increase its responsiveness to the expectations of different stakeholder groups. It can therefore strengthen the identification of environmental, social, and, reputational risks while reducing the likelihood of groupthink. Reference [2] particularly emphasize the role of board gender diversity in the context of ESG controversies.

H3. Gender diversity has a positive effect on the effective management of ESG controversies.

Board independence also constitutes a fundamental monitoring mechanism. Independent directors are more likely to challenge managerial decisions that may expose the firm to controversial practices. Reference [9] show that effective corporate governance mechanisms can mitigate the adverse consequences of ESG controversies.

H4. Board independence has a positive effect on the effective management of ESG controversies.

Finally, directors' academic background and professional experience shape the board's cognitive resources. Well-qualified directors are better equipped to interpret complex information, while professional experience facilitates the identification of early warning signals of emerging risks. Reference [4] show that sustainability related experience enhances transparency practices, whereas [7] emphasize the importance of directors' knowledge and networks for ESG outcomes.

H5. Academic background has a positive effect on the effective management of ESG controversies.

H6. Board experience has a positive effect on the effective management of ESG controversies.

III. RESEARCH DESIGN

A. Sample selection and data collection

The analysis is based on an international sample of 234 firms from 14 countries, observed over the 2015-2025 period. Financial, governance, and risk-related data were collected from Refinitiv DataStream. This cross-country diversity provides an appropriate setting for examining governance mechanisms across heterogeneous institutional and economic environments.

B. Variable measurement

The dependent variable, ESG-controversies, is measured using the ESG controversies score provided by Refinitiv. The score ranges up to 100, with higher values indicating lower exposure to major controversies and, consequently, a stronger capacity to manage ESG-related risks.

Board size is measured as the total number of directors serving on the board. CEO-duality takes the value of 1 when the CEO also serves as the chair of the board and 0 otherwise. Gender diversity is measured as the percentage of female directors, while board independence is measured as the percentage of independent directors. Board education reflects the academic, industry-related, and financial expertise of board members, whereas board experience corresponds to the average tenure of directors on the board.

Three control variables are included: Firm size, measured as the natural logarithm of total assets, ROA, used as a proxy for financial performance, and firm age, measured as the number of years since the firm was established.

C. Econometric model

The hypotheses are tested using a panel data regression model estimated with Stata 17:

$$ESG_Controversies\,it = \beta 0 + \beta 1\,Board_Sizeit + \beta 2\,Dualityit + \beta 3\,Gender_Diversityit + \beta 4 Board_Independence\,it + \beta 5\,Board_Educationit + \beta 6\,Board_Experienceit + \beta 7\,Firm_Size\,it + \beta 8\,ROAit + \beta 9\,Firm_Ageit + \varepsilon it$$

Copyright © 2026
ISSN: 2961-6611

Proceedings of Book Series PBS -Vol 43, pp.39-44 **Emerging Approaches in Modern Business**

IV. EMPIRICAL RESULTS

A. *Descriptive statistics*

Table I presents the descriptive statistics of the variables included in the analysis.

TABLE I

Panel A: Descriptive statistics of metric variables					
Variable	**Obs**	**Mean**	**SD**	**Min**	**Max**
ESG_Controversies	2.574	67.887	36.150	0.310	100.000
Board_Size	2.574	12.037	3.413	2.000	25.000
Gender_Diversity	2.574	28.256	14.831	0.000	66.670
Board_Independence	2.574	61.229	22.653	0.000	100.000
Board_Education	2.574	0.980	0.141	0.000	1.000
Board_Experience	2.574	6.464	2.674	0.290	19.460
Firm_Size	2.574	19.628	2.274	12.404	26.747
ROA	2.574	0.053	0.030	-0.040	0.147
Firm_Age	2.574	71.358	58.004	2.000	135.000
Panel B: Frequency (%) of binary variables					
	Modality			**(%)**	
Duality	1			32	
	0			68	

The descriptive statistics reveal substantial heterogeneity across firms and their governance structures. The particularly wide dispersion in the ESG controversies score indicates considerable differences in firms' ability to prevent or effectively manage adverse ESG events. From a methodological perspective, this variability is important because it provides sufficient cross-sectional and temporal variation to explain differences in risk management effectiveness based on board characteristics.

Board composition also appears to be highly heterogeneous. While board independence is generally well represented, female representation remains substantially below parity and varies considerably across firms. By contrast, the low dispersion of board education, together with a mean close to its upper bound, suggests that this characteristic is widely present across the sample. Board experience exhibits greater variation, allowing boards to be differentiated according to the accumulation of organizational knowledge and expertise. Finally, the observed ranges in firm age, size, and profitability further confirm the economic heterogeneity of the sample and support their inclusion as control variables.

B. *regression results*

Table II presents the regression results.

TABLE II

Variables	**Coef**	**T**	**Sig**
Constante	34.812***	5.47	0.001
Board_Size	0.486**	2.27	0.024
Duality	3.742**	2.56	0.011
Gender_Diversity	0.118***	3.31	0.001
Board_Independence	0.164***	3.02	0.003
Board_Education	2.145**	2.19	0.029
Board_Experience	0.237**	2.41	0.016
Firm_Size	1.583***	3.76	0.001
ROA	12.648**	2.08	0.038
Firm_Age	0.021*	1.78	0.076
$R^2 = 0.326$			
R^2 ajusté = 0.309			
Fisher (p-value) = 19.18 p-value < 0.001**			
Note(s): Table II presents the summary of direct relationship tests. Statistical significance: ***: significant at the 1% level; **: significant at the 5% level; *: significant at the 10% level			

Copyright © 2026
ISSN: 2961-6611

Proceedings of Book Series PBS -Vol 43, pp.39-44 **Emerging Approaches in Modern Business**

The estimates provide consistent support for all hypotheses. Rather than pointing to the isolated effect of any single characteristics, the results suggest that effective ESG controversy management depends on the combination of monitoring capacity and cognitive resources within the board. Board size appears to broaden the range of available expertise, while the positive effect of CEO duality suggests that, under certain governance configurations, greater unity of leadership may facilitate coordination and enable faster organizational responses to ESG related risks.

Gender diversity and board independence exhibit particularly robust relationships, reinforcing the view that the board combining a plurality of perspectives with greater autonomy from management is better equipped to identify, challenge, and correct decisions that may give rise to ESG controversies. The positive effects of directors' education and experience further support this interpretation: effective risk governance therefore depends not only on the board's formal structure, but also on the quality of its human capital.

The control variables further suggest that greater organizational and financial resources facilitate the implementation of more sophisticated prevention and monitoring mechanisms. The effect of firm age is comparatively weaker, indicating that organizational experience may contribute to risk management without, on its own, guaranteeing greater effectiveness. Overall, the model demonstrates substantial explanatory power for a behavioural analysis of corporate governance and confirms the relevance of adopting an integrated approach to board characteristics.

V. DISCUSSION

The findings show that the effectiveness of ESG controversy management depends jointly on the structure of the board and the human capital of its members. The positive effect of board size suggests that larger boards may mobilize a broader range of skills, experience, and networks needed to identify and manage risks, consistent with the findings of [8].

The positive result associated with CEO duality is particularly noteworthy. Although the concentration of power may reduce the independence of board oversight from an agency theory perspective, it may also facilitate faster decision-making and coordination when an ESG controversy requires an immediate organizational response. This interpretation is consistent with findings reported by [3].

Gender diversity and board independence also emerge as important mechanisms of risk governance. Greater female representation enhances cognitive diversity and broadens the consideration of stakeholder expectations, while independent directors strengthen the board's ability to challenge managerial decisions that may generate ESG-related risks [2], [9].

Finally, the positive effects of directors' academic background and experience confirm that board effectiveness does not depend solely on formal structural characteristics. Directors' skills and knowledge enhance their ability to interpret multidimensional issues, while experience enables them to recognize early warning signals of emerging risks more rapidly and to draw on lessons learned from previous situations [4], [7].

Taken together, these findings support an integrated view of the board of directors: it simultaneously acts as a disciplinary mechanism, a provider of strategic resources, and a cognitive body that shapes the perception and management of risks.

VI. CONCLUSION

This study examines the effect of board characteristics on the effectiveness of ESG controversy management. The findings indicate that board size, CEO-chair duality, gender diversity, board independence, directors' academic background, and board experience all exert positive and statistically significant effects.

From a theoretical perspective, the study confirms the complementarity between agency theory and resource dependence theory. It shows that the effectiveness of risk governance depends both on the monitoring role performed by the board and on the cognitive and professional resources mobilized by its members.

From a managerial perspective, firms should move beyond a purely formal conception of corporate governance and seek an appropriate balance among board independence, diversity, expertise, and experience when composing their boards. Such an approach can strengthen the board's ability to anticipate emerging threats, challenge risky managerial decisions, and develop more resilient risk management systems.

Copyright © 2026
ISSN: 2961-6611

Proceedings of Book Series PBS -Vol 43, pp.39-44 **Emerging Approaches in Modern Business**

The study nevertheless has several limitations. The ESG controversies score may be influenced by media coverage and the availability of information. In addition, certain qualitative dimensions, such as specific sustainability expertise, directors' networks, and their actual level of involvement, are not directly measured. Future research could examine complementarities among board characteristics, investigate potential nonlinear relationships, and explore the moderating role of institutional and industry-specific contexts.

ACKNOWLEDGMENT

No Acknowledgment

REFERENCES

[1] Bel-Oms, I. (2025). Determinants and consequences of environmental, social and governance controversies. Status quo and limitations of recent empirical quantitative research. Corporate Social Responsibility and Environmental Management, 32(2), 2412-2437.

[2] Brinette, S., Sonmez, F. D., & Tournus, P. S. (2023). ESG controversies and firm value: Moderating role of board gender diversity and board independence. IEEE Transactions on Engineering Management, 71, 4298-4307.

[3] Kwarteng, P., Appiah, K. O., & Addai, B. (2023). Influence of board mechanisms on sustainability performance for listed firms in Sub-Saharan Africa. Future Business Journal, 9(1), 85.

[4] Lu, J., Yu, D., Mahmoudian, F., Nazari, J. A., & Herremans, I. M. (2024). The influence of board interlocks and sustainability experience on transparent sustainability disclosure. Business Strategy and the Environment, 33(5), 3769-3793.

[5] Meckling, W. H., & Jensen, M. C. (1976). Theory of the Firm. Managerial behavior, agency costs and ownership structure, 3(4), 305-360.

[6] Pfeffer, J., & Salancik, G. R. (1978). Social control of organizations. The external control of organizations: A resource dependence perspective, 39-22.

[7] Piñeiro-Chousa, J., López-Pérez, M. L., López-Cabarcos, M. Á., & Šević, A. (2025). Busy boards and environmental, social and governance performance: a gender perspective on NASDAQ-100 firms. Review of Managerial Science, 19(12), 3663-3686.

[8] Taglialatela, J., Pirazzi Maffiola, K., Barontini, R., & Testa, F. (2023). Board of D irectors' characteristics and environmental SDGs adoption: an international study. Corporate Social Responsibility and Environmental Management, 30(5), 2490-2506.

[9] Wu, Z., Lin, S., Chen, T., Luo, C., & Xu, H. (2023). Does effective corporate governance mitigate the negative effect of ESG controversies on firm value?. Economic Analysis and Policy, 80, 1772-1793.

Copyright © 2026
ISSN: 2961-6611