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The impact of corporate governance on firms' propensity to innovate - multidimensional and cross-country analysis

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Abstract. The study examines the correlation between corporate governance ratings, a crucial element of the Environmental, Social, and Governance (ESG) index provided by Thomson Reuters, and companies' inclination towards innovation. Employing a cross-country analysis, the research explores how governance ratings influence corporate innovation decisions. The results reveal a positive association between corporate governance scores and the implementation of innovative practices. Notably, board effectiveness, commitment, vigilance, and compensation structure significantly impact firms' innovation levels. The study further demonstrates that the positive relationship between ESG ratings and innovation is particularly pronounced in companies with larger, more diverse boards, active audit committees, and well-structured compensation systems. This

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research enhances our understanding of how robust corporate governance frameworks can drive innovation by fostering transparency, accountability, and a positive work environment. Such governance structures mitigate risks, deter unethical behavior, and promote long-term corporate sustainability. Consequently, the study suggests that organizations should prioritize strong corporate governance practices to bolster their innovation capabilities. The findings underscore the pivotal role of corporate governance in shaping firms' innovative potential, contributing valuable insights to the intersection of governance and innovation in the corporate landscape.

Keywords: corporate governance rating, innovations, board effectiveness, board commitment and vigilance, board compensations.

JEL Classification: G3, M1, O3

1. INTRODUCTION

In our rapidly evolving world, where technological advancements are constant, corporate innovation has become a cornerstone of modern business (Belloc, 2012). This focus on innovation stems from the recognition that it's not merely about maintaining competitiveness; it's crucial for achieving long-term success (Porter & Heppelmann, 2014). While the potential benefits of innovation are undeniable, it also introduces challenges, particularly increased risk and vulnerability. Navigating this complex landscape requires a delicate balance between fostering creativity and mitigating potential risks. A key principle in this endeavor is the adoption of robust corporate governance practices, which proactively explore and implement innovative models contributing to an organization's enduring success (Morschett et al., 2015).

Corporate governance transcends a mere set of rules; it's the intricate system that guides and governs an organization's trajectory (Ananzeh et al., 2022). It plays a fundamental role in cultivating an environment conducive to innovation (Scherer & Voegtlin, 2020). A well-designed corporate governance framework serves as a compass for organizations, facilitating informed decision-making throughout the complex phases of innovation. It guides the identification, evaluation, and prioritization of uncertainties linked to innovation while devising strategies to mitigate or transfer associated risks (Gonzales-Bustos & Hernández-Lara, 2016).

This meticulously crafted governance framework establishes clear guidelines and criteria for evaluating potential impacts on strategic objectives, financial performance, and reputation. It acts as a vigilant guardian, adept at identifying and managing innovation-related risks, whether navigating intellectual property intricacies or averting reputational pitfalls. Moreover, a robust corporate governance framework becomes the foundation for fostering an innovation culture by providing a clear structure for decision-making and accountability. By delineating roles and responsibilities for innovation projects, organizations ensure stakeholder alignment and work towards common goals, reducing conflicts of interest and maintaining strategic alignment.

Effective corporate governance manifests through strong leadership, transparent practices, ethical considerations, and valuable stakeholder relationships. These elements cultivate a corporate culture valuing creativity, adaptability, and strategic alignment. It requires committed leadership that encourages innovation, creativity, and calculated risk-taking. The board of directors must function efficiently, making prompt, well-informed decisions. Transparency and accountability are crucial, requiring companies to keep stakeholders informed about objectives, strategies, and progress while operating ethically and sustainably (Freeman, 2010; Clark et al., 2015). This involves considering environmental, social, and economic impacts and taking

appropriate mitigating measures. Ultimately, effective corporate governance aligns executive incentives with innovation objectives, influencing decision-makers' priorities and actions (Bass & Rigg, 2006).

Stakeholder engagement is vital in the innovation process, enabling companies to better understand the needs and expectations of customers, employees, suppliers, and other external stakeholders (Freeman, 2010; Tidd & Bessant, 2019). It's a dynamic process that breathes life into organizations, tapping into a wellspring of creativity and tailoring products and services to meet evolving market needs. Effective stakeholder engagement relies on governance structures that champion open communication, collaboration, and transparency (Chen, 2014). Beyond fostering innovation, meaningful stakeholder engagement acts as a protective shield, preventing reputational damage and legal entanglements while ensuring alignment with broader societal values such as environmental sustainability, social responsibility, and human rights.

Governance plays a pivotal role in strategic planning, serving as an indispensable compass for organizations navigating change. Strategic planning, encompassing goal-setting, strategy formulation, and resource allocation, is crucial for achieving objectives. Effective governance ensures that strategic planning aligns with the organization's mission and objectives while considering the unpredictable terrain associated with innovation. It delineates clear guidelines and frameworks for decision-making, weaving a tapestry of accountability, transparency, and a culture of continuous learning and improvement. By providing a roadmap for innovation, strategic governance empowers organizations to navigate risks while nurturing and championing the exploration of novel ideas and approaches.

This research aims to serve as a practical guide for companies refining their governance structures to better support innovation. It seeks to deepen our understanding of how governance intricacies shape the innovation landscape, highlighting the pivotal role of governance in fostering a culture of innovation and shaping organizational flexibility and adaptability. Governance frameworks incorporating flexibility enable companies to swiftly react to emerging opportunities or challenges (Teece, 2018). This adaptability includes promoting experimentation and learning from failures - essential aspects of cultivating continuous innovation (Edmondson, 2018).

The temporal dimension of governance and innovation is crucial. Governance structures prioritizing long-term perspectives play a vital role in fostering sustainable innovation (Hitt et al., 2011). Corporate governance practices emphasizing long-term value can incentivize executives to invest in research and development, cultivate innovation-driven cultures, and commit to socially responsible practices resonating with employees and customers (Barnea & Rubin, 2010). However, Asaensio-Lopez et al. (2019) note the lack of consensus on the relationship between corporate governance and innovation, calling for further research to clarify this relationship.

The study is structured as follows: Section 2 encompasses the literature review and hypothesis development, Section 3 presents the methodology and data collection procedures, and Section 4 scrutinizes and discusses the findings.

2. LITERATURE REVIEW & HYPOTHESES DEVELOPMENT

In today's business landscape, success and longevity are intricately linked to the dynamic interplay between corporate governance and innovation. This symbiotic relationship has garnered attention from scholars, practitioners, and policymakers, spurring extensive research to unravel the complex connections between these crucial factors. This literature review aims to provide a comprehensive understanding of the nuanced correlation between corporate governance performance and companies' propensity to innovate, with a particular focus on evidence from diverse countries. By meticulously examining global governance practices, this study offers valuable insights into these intricate relationships, exploring both the overall

impact of corporate governance performance on corporate innovations and the effects of specific governance mechanisms.

Numerous studies have investigated the relationship between corporate governance and innovation, examining various aspects of governance and their influence on innovative practices (Chemmanur & Tian, 2017; Samlal, 2020). Jensen and Meckling's (1976) groundbreaking work stands as one of the earliest scholarly contributions linking governance mechanisms to innovation. They posited that governance, encompassing a spectrum of disciplinary mechanisms, is inherently connected to innovation, necessitating the equitable allocation of authority and decision-making responsibilities across all organizational levels. Subsequent research collectively suggests that corporate governance significantly influences innovation, with specific mechanisms such as board characteristics and R&D investment playing crucial roles (Fenwick et al., 2022; Asni & Agustia, 2022; Lin et al., 2023; Chemmanur & Tian, 2017; Samlal, 2020).

Corporate governance, as a comprehensive system, encompasses various critical factors including board structures, processes, and relationships, all of which are vital in guiding and supervising organizations. Key elements such as board composition, executive compensation, shareholder rights, transparency, and ethical considerations are recognized as integral components of effective corporate governance (Adams & Ferreira, 2009; Shleifer & Vishny, 1997). These dimensions collectively shape organizational culture, foster risk-taking propensity, and influence strategic decision-making processes - all crucial in creating an environment conducive to innovation.

Optimizing board size, maximizing the role of independent directors, and controlling large shareholders are necessary to encourage innovation practices (Atallah et al., 2020). Rabi and Hassan (2010) found that board compensation and meeting frequency are key determinants of innovation investment effectiveness in Malaysian companies. Yameen et al. (2019) revealed that board composition and diligence significantly impact financial performance. Sapra et al. (2012) developed a theory predicting a U-shaped relationship between innovation and external takeover pressure, supported by empirical evidence. Zhang et al. (2014) further explored R&D investment's role, finding that it mediates the relationship between corporate governance and firm performance in the Chinese IT industry.

Aghion, Van Reenen, and Zingales (2005) established a connection between institutional ownership and a firm's inclination toward innovation. Family factors, such as commitment to business continuity and clear control, influence corporate governance effectiveness in family firms' innovation (Ong & Menkhoff 2023). In Chinese state-owned enterprises, corporate party organizations play a governance role in reducing management myopia and R&D over-investment, leading to positive innovation outputs (Lin et al., 2023). Global perspectives on corporate governance and innovation are also examined, acknowledging variations in practices across countries as elucidated by La Porta et al. (1998) and Ananzeh et al. (2022). These cross-country differences underscore the influence of regulatory environments, cultural norms, and legal frameworks on governance mechanisms and their subsequent impact on innovation outcomes.

2.1. Corporate governance and innovation link

The concept of governance encompasses both "constraining" and "enabling" functions, recognizing the need for control and flexibility in managing organizations (Samlal, 2020; Zona et al., 2013). Effective governance requires a delicate balance between rules and autonomy, discipline and creativity, and stability and change. This equilibrium is crucial for creating a governance framework that upholds accountability, transparency, and ethical conduct while nurturing innovation, learning, and adaptability (Samlal, 2020; Adams & Ferreira, 2009; Shleifer & Vishny, 1997).

The constraining function of governance, as delineated by Samlal (2020), refers to the role of rules, regulations, and policies in steering and regulating individual and organizational behavior. This perspective

views governance as a mechanism to ensure adherence to established norms, prevent misconduct, and curb unethical behavior. It underscores the significance of monitoring, enforcement, and punitive measures in maintaining order and stability within an organization.

Conversely, the enabling function of governance, as described by Samlal (2020) and Alegre-Vidal et al. (2004), focuses on cultivating an environment conducive to learning, collaboration, and the generation of novel ideas and capabilities. This perspective emphasizes the importance of fostering a culture of trust, openness, and innovation, which is essential for encouraging creativity and supporting the development of new ideas.

From a cognitive perspective, a firm is perceived as a dynamic entity in constant interaction with its environment, adapting to evolving circumstances (Samlal, 2020; Alegre-Vidal et al., 2004; Zona et al., 2013). Knowledge and competencies are recognized as pivotal resources that enable organizations to comprehend and respond effectively to challenges and opportunities. Governance mechanisms play a crucial role in facilitating the acquisition, creation, sharing, and application of knowledge within the organization, establishing structures, processes, and incentives that encourage learning, experimentation, collaboration, and continuous enhancement of capabilities (Zona et al., 2013).

Effective corporate governance, as argued by Samlal (2020) and Akpan (2022), constructs a framework that guides the behavior and decision-making of organizational leaders. By delineating clear lines of accountability and transparency, governance ensures that leaders are held responsible for their actions and accountable to stakeholders (Alegre-Vidal et al., 2004). Consequently, effective corporate governance not only mitigates risks and prevents unethical behavior but also sets ethical standards, promotes integrity, and ensures that leaders align their actions with the company's values and objectives (Adams & Ferreira, 2009; Akpan, 2022).

Effective corporate governance enables efficient resource utilization, resulting in higher returns on assets and demonstrating the capacity for resource allocation towards profitable and innovative activities. When leverage is managed effectively under rigorous governance, it can facilitate necessary capital for innovation while avoiding excessive debt. The maintenance of adequate liquidity through robust governance structures ensures that a company can invest in innovation without compromising operational stability. Thus, corporate governance becomes a pivotal mechanism motivating organizational leaders to act in the best interests of the company and its stakeholders, ultimately enhancing the company's tendency to innovate.

Furthermore, corporate governance should ensure that innovation outcomes are socially acceptable, align with sustainable development principles, and are delivered efficiently. To ensure resulting innovations benefit society and the environment, they must be developed within a governance framework supporting sustainable and ethical practices (Scherer & Voegtlin, 2020).

Based on this literature review, the following hypothesis is formulated:

H1: The overall corporate governance performance positively affects the firm's tendency to innovate.

This hypothesis is supported by the idea that a well-structured governance framework, encompassing both constraining and enabling functions, not only enforces discipline and ethical behavior but also fosters an environment where innovation can thrive. Corporate governance is a highly intricate and multifaceted construct requiring a comprehensive understanding of its various components and dimensions (Kędziora & Penttinen, 2021; Akpan et al., 2022). While empirical research demonstrates the prevalence of different mechanisms, this study focuses on specific mechanisms, including board effectiveness, board committees and commitment, and board compensation, as critical factors in enhancing a firm's tendency to innovate.

2.2. Board impact on innovation – board effectiveness

The board of directors plays a crucial role in supporting decision-making and serving as a mechanism for monitoring and control (Akpan et al., 2022). From the perspective of agency theory, the board acts as the primary internal control mechanism for overseeing and managing executives (Fama & Jensen, 1983), thereby influencing the firm's innovative capabilities. The board contributes to fostering innovation by facilitating the development and implementation of strategies, ideas, and policies, as well as by nurturing a culture of innovation within the organization (Lin et al., 2023; Chemmanur & Tian, 2017; Samlal, 2020; Akpan et al., 2022). Additionally, it plays a vital role in energizing, educating, mediating, and organizing interactions among various stakeholders (Samlal, 2020; Akpan, 2022). This involvement enhances the company's capabilities, expertise, and overall innovation potential (Zona, 2016). A strong and knowledgeable board, equipped with sound management and performance judgment, is essential for fostering competitiveness and achieving high performance (Adams & Ferreira, 2009; Shleifer & Vishny, 1997), while also mitigating potential negative consequences (Scherer & Voegtlin, 2020).

Research by Iyengar and Sundararajan (2020) suggests that firm size, capital expenditure growth, and industry concentration significantly influence a firm's innovation efforts. They also find that younger CEOs are more prone to innovation compared to their older counterparts. Belloc (2012) indicates that diverse and independent boards are associated with increased R&D expenditure and a greater propensity to innovate, while concentrated ownership structures can lead to resource misallocation and adversely impact innovation rates.

Chatjuthamard et al. (2023) find a significant correlation between the proportion of independent directors and innovation efficiency, noting that firms required to increase board independence experienced a marked increase in innovation compared to those that did not alter their board composition. Furthermore, board size has been identified as a significant factor affecting innovation (Asni & Agustia, 2022). Vafaei et al. (2021) also report a positive correlation between board diversity and innovation activity, particularly when female directors are present on the board.

Based on the findings of this literature review, it is possible to analyze the board in several ways:

1. Board size: the total number of directors
2. Board independence: the proportion or percentage of independent directors
3. Board diversity: in terms of gender, nationality, and other factors

Given these considerations, the following hypotheses are proposed:

H2a: Board size is likely to affect firm innovation.

H2b: Board diversity is likely to affect firm innovation.

H2c: Board independence is likely to affect firm innovation.

2.3. Board commitment & vigilance

In the realm of company innovation, board commitment significantly influences an organization's ability to harness resources and capabilities. Committed board members actively engage in bringing external resources, such as industry knowledge, networks, and partnerships, into the company, thereby enhancing the innovation process (Akpan, 2022). Furthermore, board commitment fosters a culture of innovation within the organization. By acting as exemplars and advocates for innovation, committed board members establish an organizational tone that inspires employees at all levels to embrace new ideas, take calculated risks, and engage in creative thinking (Olori & Sylva, 2017; Akpan, 2022; Samlal, 2020). Such a culture not only values innovation but actively encourages it, thereby enhancing the firm's innovative output (Sierra-Morán et al., 2021).

Moreover, the depth of board commitment is pivotal in enhancing innovation-related decision-making. Board members contribute diverse perspectives and expertise, facilitating informed and strategic choices regarding innovation strategies, investments, and partnerships. Their extensive understanding of the industry, market trends, and the competitive landscape enables well-informed decisions that reduce the likelihood of costly errors and increase the probability of successful innovation outcomes (Akpan, 2022; Samlal, 2020; Sierra-Morán et al., 2021).

In this context, the audit committee plays a critical role by overseeing financial controls and risk management, ensuring that innovation projects are financially viable and within acceptable risk parameters. This oversight is crucial for efficient resource allocation and management of financial risks associated with new initiatives (Akpan, 2022; Kedziora & Penttinen, 2021). The audit committee's vigilant oversight contributes directly to the strategic alignment and success of innovation efforts.

The frequency of board meetings significantly influences the board's effectiveness in supporting innovation. Regular meetings provide continuous engagement with and oversight of innovation strategies, enabling the board to offer timely guidance, monitor progress, and adapt strategies as necessary. This regular interaction ensures that the board remains well-informed and proactive in its governance role, closely aligning with the firm's strategic goals and fostering a dynamic environment for innovation (Sierra-Morán et al., 2021).

Board commitment is also essential in the implementation and execution of innovative initiatives. Through active involvement and oversight, board members provide invaluable guidance, support, and accountability throughout the innovation process. They play a critical role in ensuring that innovative concepts are effectively translated into tangible outcomes, overcoming barriers and challenges that may arise during the implementation phase (Akpan, 2022; Sierra-Morán et al., 2021). This aligns with the resource and capabilities theory, which posits that board members act as conduits for accessing external resources not readily available within the organization, suggesting that when these resources are effectively developed, they can transform into dynamic capabilities such as innovation (Barney, 1991; Chen, 2014; Sierra-Morán et al., 2021).

Based on these considerations, the following two hypotheses are developed:

H3a: The audit committee is likely to affect firm innovations.

H3b: The number of board meetings is likely to affect firm innovations.

Given the availability of data in the study, it was assumed that the number of board meetings acknowledged in hypothesis H3b would be represented by the average overall percentage of attendance at board meetings reported by the company (Table 2).

2.3. Board compensation

The correlation between board compensation levels and organizational innovation has been established in previous research. Drawing from Jensen and Murphy's (1990) work, we propose that organizations offering competitive and performance-based compensation packages to their boards are more inclined to cultivate an environment fostering innovation. Their research, demonstrating the connection between executive compensation and organizational performance, implies that well-compensated boards are motivated to actively participate in strategic decision-making processes driving innovation.

Additionally, Bebchuk and Fried's study (2004) on long-term performance pay further supports our hypothesis. Their emphasis on aligning compensation structures with organizational objectives and performance outcomes highlights the potential of compensation packages to stimulate long-term innovation

strategies. Boards incentivized for sustained innovation are likely to prioritize and advocate for initiatives contributing to the organization's long-term innovative success.

The principal-agent theory suggests that agency costs between shareholders and managers can be minimized by implementing appropriate compensation incentive mechanisms (Hartzell and Starks, 2003). This mechanism facilitates the alignment of shareholders with the enterprise's future development, allowing them to partake in benefits and interests alongside the managerial team. The executive compensation structure, acting as a safeguarding incentive, ensures that executives' fundamental material needs are met.

Consequently, boards endowed with competitive compensation packages are better positioned to steer strategic decisions that prioritize and propel innovation, fostering an organizational environment capable of adapting and responding to evolving market demands. Moreover, by offering appealing compensation packages, boards can attract top-tier talent possessing the requisite skills and knowledge crucial for steering innovation. These adept individuals, in turn, play a pivotal role in shaping and executing effective strategies that bolster innovation within the organization.

Furthermore, the allure of competitive compensation packages contributes to retaining these skilled individuals, thereby ensuring the stability of a knowledgeable workforce capable of sustaining innovation in the long term. In light of these considerations, the following hypothesis is formulated:

H4: Board compensation is likely to affect firm innovation.

The subsequent sections of this paper will present a more detailed examination of the specific factors within corporate governance that may influence a company's capacity for innovation.

3. DATA AND METHODOLOGY

3.1. Study sample and data

The researchers utilized the Thomson Reuters Eikon database, a comprehensive financial repository offering access to diverse financial and economic data spanning from 2010 to 2020. It's important to note that this dataset may not fully reflect current corporate governance and innovation practices due to the inability to obtain more recent data from the Thomson Reuters ESG database.

While using more up-to-date data would increase the practical significance of the results, the 2010-2020 period was characterized by significant developments in both corporate governance systems and innovation approaches. During this decade, organizations enhanced corporate governance mechanisms to improve effectiveness, particularly in areas of disclosure, accountability, and stakeholder communication. Simultaneously, innovation practices evolved, with increased emphasis on sustainability, digitalization, and co-creation. The knowledge gained from this period remains valuable for analyzing the relationship between governance structures and innovation likelihood. Firms that adopted sound governance systems were typically better positioned to promote innovation by containing risks and channeling resources to innovation projects. Moreover, these findings provide important historical background for current and future research. By analyzing the role of established governance practices in corporate innovation evolution, researchers and practitioners can identify key factors determining positive innovation outcomes. This understanding is particularly crucial as organizations navigate a constantly changing business environment, where the relationship between governance and innovation remains a key driver of competitive advantage and organizational resilience.

The database served as a valuable resource for collating information on corporate governance practices, including board composition, executive compensation, shareholder rights, and disclosure practices. To ensure a well-rounded depiction, the researchers intentionally selected a diverse range of countries,

encompassing both developed and developing economies, aiming to foster a nuanced comprehension of governance practices within distinct contextual settings.

Following data collection, a meticulous analysis process was undertaken to mitigate potential biases. This involved data cleansing and systematic organization, scrutiny for outliers and inconsistencies, and application of statistical analyses to unveil discernible patterns and trends. The researchers addressed possible data limitations, such as measurement errors or missing data, implementing appropriate methodologies to rectify these concerns. Sensitivity analyses were conducted to assess the resilience of their findings. Countries with insufficient data were excluded from the final sample to uphold the reliability and validity of the study's conclusions. The resultant sample, comprising 53 countries, furnished a robust and representative dataset for the study's inquiries (Table 1). These countries are believed to ensure a diverse and representative analysis of the relationship between corporate governance and innovation. The selection of countries was guided by data availability. Only countries with comprehensive and reliable data on corporate governance ratings and firm-level innovation metrics available for the entire study period (2010-2020) from the Thomson Reuters ESG database were included in the sample.

Table 1

Tabulation of the study sample

Region	Country	Percent
North America	United States of America	20.28%
	Canada	2.41%
	Mexico	1.18%
Europe	United Kingdom	8.75%
	Germany	3.01%
	France	2.87%
	Switzerland	2.36%
	Netherlands	1.20%
	Sweden	2.29%
	Austria	0.51%
	Belgium	0.74%
	Denmark	0.98%
	Finland	0.96%
	Ireland; Republic of	0.95%
	Italy	0.73%
	Greece	0.35%
	Portugal	0.22%
	Luxembourg	0.22%
	Malta	0.05%
	Norway	0.65%
	Hungary	0.10%
	Poland	0.38%
Israel	0.19%	
Asia	China	7.52%
	Japan	9.66%
	South Korea	3.41%
	Hong Kong	2.66%
	India	2.50%
	Malaysia	1.32%

	Indonesia	1.01%
	Taiwan	1.92%
	Philippines	0.58%
	Kazakhstan	0.01%
	Cambodia	0.01%
	Kuwait	0.01%
	Singapore	1.10%
	Thailand	0.45%
	Turkey	0.88%
	United Arab Emirates	0.10%
Latin America	Brazil	1.61%
	Argentina	0.01%
	Chile	0.52%
	Colombia	0.19%
	Peru	0.10%
Africa	South Africa	2.60%
	Egypt	0.12%
Middle East	Saudi Arabia	0.21%
	Qatar	0.10%
Caribbean	Bermuda	0.22%
Oceania	Australia	7.23%
	New Zealand	0.72%
Other	Russia	1.02%

3.2. Research models

In examining the relationship between governance rating and corporate innovations, this study employs Model 1 and utilizes the Pooled Ordinary Least Squares (OLS) regression approach to assess the research hypotheses. This methodological framework facilitates the exploration of the governance rating-corporate innovations nexus while accounting for other pertinent factors. The chosen approach aligns with previous research in the domain of corporate governance and its influence on, as well as its relationship with, various other factors, including corporate social responsibility (Kabir & Thai, 2017) and performance (Wang et al., 2020).

A significant methodological consideration addressed in this analysis is heteroscedasticity, which denotes the non-uniform variances of error terms in the regression model. To mitigate this concern, the OLS regression is clustered at the country level, effectively grouping the data by country and conducting the regression analysis independently for each country. This clustering technique serves to ameliorate potential heteroscedasticity issues, yielding more precise estimates of the relationship between governance rating and corporate innovations. Furthermore, the analysis incorporates a sector-fixed effect to accommodate sector-specific variances that may influence firms' innovations due to their unique characteristics, thus controlling for distinct sector-specific differences in innovation levels.

To account for temporal effects, a dummy variable for each year is integrated into the regression model. This enables an examination of how the relationship between governance rating and corporate innovations may evolve over time, capturing any time-specific influences. To scrutinize the potential presence of multicollinearity, diagnostic tests, including the variance inflation factor (VIF) and tolerance, are conducted. The VIF, which gauges the extent to which the variance of estimated regression coefficients is elevated due to multicollinearity, was found to be below 5 for all variables, indicating an absence of multicollinearity.

concerns. Similarly, tolerance values, measuring the proportion of variance in a predictor variable not explained by other predictors, were all above 0.2, further affirming the absence of multicollinearity. Additionally, visual assessments of relationships between variables are conducted through scatterplots and partial correlation plots. A comprehensive correlation matrix, as presented in Table 2, aids in examining the variables under study. The findings from this matrix are utilized to ascertain the presence of multicollinearity, with a coefficient of approximately eight indicative of its existence. The results affirm that multicollinearity is not violated in this specific study.

Model 2 of this research expands upon prior literature by incorporating multiple forms of corporate governance to examine their unique effects on corporate innovation. Board size is considered, as large boards are generally believed to possess more diverse experience and perspectives, potentially leading to more creative solutions (Coles et al., 2008). Gender diversity on the board has been found to enhance creativity and problem-solving skills in the boardroom, thereby improving innovation. Diverse boards bring different approaches and backgrounds, resulting in more thorough assessments of new concepts and approaches (Miller & Triana, 2009). Independent directors are expected to bring impartiality to their functioning and are considered one of the most effective solutions to agency costs arising from the separation of ownership and control (Coles et al., 2008; Miller & Triana, 2009). Their independence from management allows them to question the status quo and provide input on new ideas that may serve the company's long-term interests. An active audit committee is associated with better financial controls and risk management, potentially creating a stable environment conducive to innovation. Audit committees are responsible for ensuring the integrity of financial reporting and compliance, which can minimize the risks associated with innovative projects (Abbott et al., 2004). The number of board meetings held is an indicator of the board's activity and monitoring capabilities. Regular meetings enable the board to stay informed about the company's operations and innovation activities, allowing them to offer timely guidance and support (Brick & Chidambaran, 2010). Compensation designs that align board members' incentives with those of shareholders are crucial for innovation (Zhou et al., 2021). Non-fixed compensation, such as stock options, may encourage board members to support riskier, innovative projects with potentially high returns.

Several control variables are included in the model to account for factors that may influence corporate innovation. Firm size is considered, as larger firms typically have more resources to invest in innovation, including R&D, talent acquisition, and technology. However, they may also face bureaucratic challenges that impede innovation. The literature provides mixed evidence on the impact of firm size on innovation, making it an important control variable (Zhou et al., 2021). Profitability is included as it provides the financial capacity to support innovation. Firms with higher profitability are more likely to invest in innovative activities due to their ability to bear the associated costs and risks (Jung & Kwak, 2018). In the proposed model, profitability is measured by the ratio of net income to total assets, offering a more focused analysis of how profit generation is linked directly to the assets employed in the business. The level of debt in a firm's capital structure, or leverage, can influence innovation. High leverage may constrain a firm's ability to invest in innovation due to financial distress or the need to service debt. Conversely, some theories suggest that moderate leverage can discipline management and reduce agency costs, potentially fostering innovation (Zhou et al., 2021). Liquidity, which measures a firm's ability to meet short-term obligations, is crucial for maintaining operational flexibility (Jung & Kwak, 2018). Firms with higher liquidity may be better positioned to finance innovative projects without resorting to external financing. By incorporating these variables, the model provides a comprehensive framework for analyzing the complex relationship between corporate governance and innovation, while controlling for other influential factors.

(Model 1)

$$INV_{it} = \beta_0 + \beta_1 Gov_{it} + \beta_2 Size_{it} + \beta_3 PROF_{it} + \beta_4 Lev_{it} + \beta_5 Liq_{it} + Year + Sector + \varepsilon_{it}$$

(Model 2)

$$INV_{it} = \beta_0 + \beta_1 Bsize_{it} + \beta_2 Bdiv_{it} + \beta_3 Bind_{it} + \beta_4 Audt_{it} + \beta_5 Bmet_{it} + \beta_6 Bcomp_{it} + \beta_7 Size_{it} + \beta_8 PROF_{it} + \beta_9 Lev_{it} + \beta_{10} Liq_{it} + Year + Sector + \varepsilon_{it}$$

A comprehensive overview of variables used in the models is provided in Table 2.

Table 2

Measurement of the study variables

Variable	Symbol	Measure
Corporate innovations	INV	The ratio of research and development (R&D) investment to operation income
Governance Score	Gov	The governance rating based on Thomson Reuters
Board size	Bsize	The total number of board members
Board diversity	Bdiv	The representation of female directors on the board
Board independence	Bind	The representation of non-executive directors on board
Board meeting	Bmet	The average overall attendance percentage of board meetings as reported by the company.
Audit Committee	Audt	1 is assigned if the firm has an audit committee
Board Compensation	Bcomp	The natural logarithm of board compensation
Firm size	Size	The log value of the company's total assets
Return on assets	Prof	Net income to total assets
Leverage	Lev	Total debt to total assets
Liquidity	Liq	The ratio of current assets to current liabilities

Table 3 presents the results of the correlation analysis conducted on the variables included in the models.

Table 2

Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) INV	1.000											
(2) Gov	0.105	1.000										
(3) Bsize	0.144	0.121	1.000									
(4) Bdiv	-0.024	0.223	0.081	1.000								
(5) Bind	-0.084	0.225	-0.145	0.279	1.000							
(6) Audt	-0.026	0.046	-0.012	0.148	0.290	1.000						
(7) Bmet	0.071	0.149	-0.079	-0.014	-0.272	-0.125	1.000					
(8) Bcomp	-0.042	0.150	0.186	0.217	0.445	0.231	-0.275	1.000				
(9) Size	0.225	0.251	0.476	0.071	-0.009	-0.046	-0.060	0.195	1.000			
(10) PROF	0.013	-0.004	-0.008	-0.008	-0.000	0.002	-0.001	-0.005	0.004	1.000		
(11) Lev	-0.223	-0.141	-0.241	-0.115	0.060	-0.023	-0.072	-0.004	-0.349	0.007	1.000	
(12) liq	0.154	0.059	0.150	0.056	0.069	0.044	-0.083	0.105	0.295	-0.015	-0.374	1.000

Source: own study.

3.3. Measurement of the study variables

Independent variable.

In the realm of assessing a company's sustainability, ESG rating scores have garnered significant attention in academic research. Thomson Reuters, for instance, has crafted an ESG score to evaluate a company's sustainability performance, incorporating three crucial pillars: environmental, social, and

governance (Al Amosh et al., 2023). Drawing from a curated selection of 178 fields organized into ten primary categories, this score calculates ESG indicators. The substantial weight of 30.5% assigned to governance factors underscores their importance in the weighting system. This meticulously constructed proxy provides investors, researchers, and stakeholders with profound insights into a company's sustainability efforts, facilitating well-informed decision-making. Consequently, this variable functions as a valuable tool for indicating the governance rating in our study.

Dependent variable.

Despite the prevalence of research and development (R&D) expenditure as a metric for assessing innovation, challenges arise in its accurate reflection, particularly for large firms, as highlighted by Dachs et al. (2007). The discrepancy stems from large firms with significant R&D investments, where their substantial net sales or revenues might cause R&D expenditures to appear disproportionately small. To address this, Dachs et al. (2007) propose scaling R&D expenses by total operating expenses, offering a more precise evaluation of R&D intensity.

Corporate innovation, denoting the development and implementation of new ideas, technologies, and products within a company, plays a pivotal role in technological advancements and product improvements. A quantitative measure of a company's commitment to innovation involves examining the ratio of R&D investment to operational income (Tian et al., 2020; Sukumar et al., 2020). This metric gauges the financial dedication a company allocates to innovation through its R&D initiatives. The calculation of this metric extends to dividing a company's R&D expenses by its net sales and revenues (Becker & Dietz, 2009; Guidara & Boujelbene, 2016). This ratio signifies the proportion of a company's income directed toward R&D activities, with a higher ratio indicating a more substantial commitment to innovation. Dachs et al. (2007) highlight a potential flaw in evaluating R&D investments, especially for larger firms, proposing a solution that involves scaling R&D expenses by total operating expenses. This approach yields a more accurate evaluation of R&D intensity, representing the proportion of total operating expenses allocated to R&D activities. This metric offers valuable insights into how organizations prioritize and allocate resources to their R&D endeavours, aiding companies in assessing their level of investment in innovation and making informed comparisons with industry benchmarks or competitors.

Control variable

The present investigation meticulously examines various firm indicators that have been identified in prior studies.

4. EMPIRICAL ANALYSIS

4.1. Descriptive statistics

The descriptive statistics of the study variables reveal a diverse range of values, providing insights into the characteristics of the dataset. The dependent variable, INV, which serves as a proxy for a company's commitment to fostering innovation, is determined by the ratio of R&D investment to operational income. It exhibits a mean of 0.467, indicating a positive average, with a standard deviation of 0.762, suggesting notable variability around this mean. The governance performance (GOV) variable demonstrates a mean of 48.786, with a wide distribution as evidenced by a standard deviation of 22.749.

Regarding board characteristics, the average Board Size (Bsize) of 9.911 suggests that companies in the dataset typically have approximately 10 board members, with moderate variability ranging from 5 to 15 members. Board Diversity (Bdiv) presents a mean of 14.256, indicating a notable level of diversity on company boards, with scores ranging from 0 to 33.333. Board Independence (Bind) shows an average of 57.163, suggesting moderate levels of independence, albeit with considerable variability (scores ranging from

8.333 to 90). Board Meeting Frequency (Bmet) exhibits a high average of 88.959, indicating frequent board meetings, with scores ranging from 0 to 100. The presence of an Audit Committee (Audt) is prevalent, with a mean of 0.92, while Board Compensation (Bcomp) shows an average of 13.634, ranging from -0.45 to 21.721, indicating moderate compensation levels with limited variability.

Among the control variables, firm size (Size) presents an average of 18.659, suggesting moderate company sizes in the dataset, with scores ranging from 14.053 to 22.068. Return on Assets (Prof) exhibits considerable variability in profitability, with a mean of -0.072 and a substantial standard deviation of 19.836. The Leverage (Lev) variable shows an average value of 2.238, with moderate variability ranging from 0.293 to 5.981. Liquidity (Liq) demonstrates an average value of 0.193, with limited variability ranging from 0 to 0.517.

These descriptive statistics collectively offer a comprehensive understanding of the dataset, encompassing the central tendencies, variabilities, and ranges for each variable in the study. Such insights are crucial for contextualizing the subsequent analyses and understanding the characteristics of the companies included in the research.

Table 4

Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
INV	.467	.762	-1.282	1.892
Gov	48.786	22.749	.104	99.376
Bsize	9.911	2.888	5	15
Bdiv	14.256	11.467	0	33.333
Bind	57.163	25.579	8.333	90
Audt	.92	.271	0	1
Bmet	88.959	11.735	0	100
Bcomp	13.634	1.229	-.45	21.721
Size	18.659	2.264	14.053	22.068
PROF	-.072	19.836	-2509	3689
Lev	2.238	1.69	.293	5.981
liq	.193	.18	0	.517

Source: own study.

4.2. Results and discussion

Table 5 presents the results of a regression analysis investigating the relationship between corporate governance rating and corporate innovation. The estimated coefficients for each cell are provided, along with the corresponding t-statistics in parentheses. To ensure accurate conclusions, the study included control variables for corporate innovation in the first column and added Gov to the model in the second column.

The coefficient for Gov emerged as statistically significant at the 0.10% level, revealing a positive correlation with the dependent variable. This finding underscores the pivotal role of governance performance in shaping innovation practices, suggesting that an enhanced Gov score is associated with favorable impacts on innovation practices.

Successful implementation of corporate governance fosters trust and confidence among investors and the public. When leaders adhere to ethical standards and prioritize the long-term sustainability of the organization, it augments the company's reputation and credibility (Alegre-Vidal et al., 2004; Adams & Ferreira, 2009). This, in turn, attracts more investors and stakeholders, resulting in increased financial

stability and growth opportunities for the organization (Samlal, 2020). Furthermore, effective corporate governance aids in preventing conflicts of interest and ensures fair treatment of all stakeholders. The establishment of clear guidelines and decision-making procedures reduces the likelihood of biased or self-serving actions by leaders (Adams & Ferreira, 2009). This cultivates a culture of fairness and equality within the organization, promoting employee satisfaction and loyalty (Akpan, 2022). Moreover, it encourages open communication and collaboration between leaders and employees, fostering a positive work environment and enhancing overall organizational performance (Samlal, 2020).

This proactive approach to risk management helps prevent financial crises and ensures operational continuity, even in challenging economic conditions (Adams & Ferreira, 2009). In conclusion, effective corporate governance establishes a framework guiding leaders' behavior and decision-making, promoting accountability and transparency, mitigating risks, preventing unethical behavior, building trust and confidence, ensuring fair treatment of stakeholders, fostering a positive work environment, and contributing to the long-term sustainability and resilience of the organization. Therefore, organizations must prioritize the implementation of effective corporate governance practices to achieve their innovation goals. Additionally, effective corporate governance promotes innovation and adaptability, as leaders are encouraged to explore new opportunities and make informed decisions aligned with the organization's strategic objectives (Akpan, 2022).

The study unveiled that firm size significantly impacts innovation practices, evidenced by statistically significant coefficients at the 0.01% level compared to control variables. This implies that larger firms, indicated by higher log values of total assets, exert a positive influence on innovation practices. The statistical analysis also reveals a positive and statistically significant relationship between profitability and innovation, with coefficients significant at the 0.01% level. Furthermore, the coefficient for Lev is highly significant at the 0.01% level, indicating that increased leverage has a negative impact on innovations. Additionally, Liquidity exhibits statistical significance at the 0.10% level, suggesting a positive association between liquidity and innovations.

Table 5

The relationship between Gov rating and corporate innovations

VARIABLES	(1)	(2)
	INV	INV
Gov		0.00704* [1.72]
Size	0.0521*** [2.71]	0.101*** [4.39]
Prof	0.00448*** [3.99]	0.00362*** [3.73]
Lev	-0.0578*** [-7.08]	-0.0670*** [-12.23]
Liq	0.281** [2.48]	0.159* [1.73]
Constant	-0.476 [-1.11]	-1.497*** [-2.88]
Observations	28,733	28,733
R-squared	0.081	0.123

Source: own study.

The study conducted a separate regression analysis to examine the impact of board effectiveness, commitment, vigilance, and compensation on innovation practices. The results, as presented in Table 6, reveal that board size is positively correlated with innovation, suggesting that larger boards are more likely to foster innovative practices. This association is statistically significant at the 0.01% level. Furthermore, the presence of female directors on the board, a key indicator of diversity, is also found to positively influence innovation, with a significance level of 0.05%. However, no statistically significant effect was observed for board independence.

The role of the board of directors is essential, both in providing strategic guidance and serving as a mechanism for oversight and control. According to Akpan et al. (2022), the board ensures that management's decisions align with the interests of the company and its stakeholders. The board's contributions extend beyond governance; it offers valuable expertise and insights to the management team, enabling more informed decision-making that contributes to the organization's long-term success.

From the perspective of agency theory, the board serves as a safeguard against conflicts of interest within the corporate structure. Fama and Jensen (1983) argue that the separation of ownership and control creates a principal-agent problem, wherein managers may prioritize their own interests over those of shareholders. In this context, the board acts as a critical accountability mechanism, ensuring that the management team remains aligned with shareholders' objectives.

The board's role in fostering firm innovation is strategic, entailing the development and implementation of strategies, ideas, and policies under its supervision, as outlined by Lin et al. (2023). It plays a guiding role in identifying and pursuing innovative opportunities, while cultivating an environment where innovation can flourish. Chemmanur and Tian (2017) further highlight the board's influence in providing resources, supporting innovation projects, allocating funds, building networks, and promoting an atmosphere conducive to experimentation and risk-taking. This proactive approach helps ensure that the company maintains its competitive advantage and adapts to changing market conditions. Samlal (2020) emphasizes the significance of diversity in board composition, noting that a range of backgrounds and perspectives can stimulate creativity and innovation by introducing new ideas and approaches.

In addition to these key responsibilities, an effective board ensures legal and ethical compliance, protecting the interests of shareholders and stakeholders, as noted by Samlal (2020). This stewardship requires a comprehensive understanding of the company's operations, risks, and opportunities, as well as awareness of the broader economic and social context. By promoting long-term sustainability, the board advocates for responsible and sustainable business practices, including environmental stewardship, social responsibility, and ethical governance, as emphasized by Zona (2016). This holistic approach not only enhances the company's reputation but also attracts socially conscious investors and customers, while mitigating risks associated with environmental and social challenges.

In conclusion, the role of an efficient board of directors is pivotal in enhancing organizational effectiveness, competitiveness, and sustainability. Through strategic oversight, leadership, and guidance, a competent board enables the company to navigate complex challenges while capitalizing on opportunities for growth and innovation.

Table 6

The impact of corporate governance mechanisms on corporate innovations

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	INV	INV	INV	INV	INV	INV	INV
Bsize	0.00909* [1.70]						0.00861** [2.50]
Bdiv		0.00302** [2.22]					0.00108** [1.26]
Bind			-0.0209 [-3.01]				-0.00733 [-1.29]
Audt				0.0965** [2.32]			0.0234** [0.91]
Bmet					0.00145 [0.97]		0.00198 [2.24]
Bcomp						0.0338*** [4.11]	0.0220*** [3.08]
Size	0.0956*** [5.90]	0.109*** [5.86]	0.105*** [6.72]	0.104*** [5.53]	0.0523*** [2.79]	0.111*** [7.54]	0.0980*** [7.47]
Prof	0.000370*** [3.93]	0.000358*** [3.69]	0.000369*** [3.84]	0.000368*** [3.80]	0.000448*** [3.97]	0.000336*** [3.49]	0.000343*** [3.72]
Lev	-0.0665*** [-11.13]	-0.0708*** [-14.04]	-0.0673*** [-12.41]	-0.0689*** [-13.32]	-0.0572*** [-7.74]	-0.0637*** [-11.95]	-0.0618*** [-10.12]
Liq	0.155 [1.56]	0.150 [1.53]	0.187** [2.06]	0.172* [1.80]	0.288*** [2.71]	0.157 [1.64]	0.175* [1.85]
Constant	-1.419*** [-3.52]	-1.592*** [-3.72]	-1.398*** [-3.80]	-1.418*** [-3.13]	-0.615 [-1.61]	-1.169*** [-2.97]	-1.249*** [-3.14]
Observations	28,733	28,733	28,733	28,733	28,733	28,733	28,733
R-squared	0.121	0.122	0.126	0.122	0.082	0.135	0.138

Source: own study.

Regarding board commitment and vigilance, the study finds a statistically significant positive association between the presence of an audit committee and innovation, with a significance level of 0.05%. However, the frequency of board meetings does not demonstrate statistical significance, as none of the variations exceed the critical threshold.

The board's commitment to fostering firm innovation extends beyond statistical metrics, actively shaping the strategic direction of the organization. Dedicated board members play a crucial role in the formulation and implementation of innovation strategies, ensuring that these initiatives are in alignment with the organization's overarching goals and objectives (Olori & Sylva, 2017). Their insights into emerging trends, market opportunities, and innovation potential, as highlighted by Akpan (2022), are essential in maintaining the organization's competitive edge. By proactively guiding innovation, the board helps the company adapt to shifting market dynamics, thereby enhancing its competitiveness.

Additionally, a board committed to innovation acts as a key driver in attracting and retaining top talent. Recognizing that human capital is central to innovation, dedicated board members advocate for talent development and retention programs (Samlal, 2020). They support the creation of an inclusive, collaborative environment that encourages experimentation and continuous learning, as emphasized by Sierra-Morán et

al. (2021). By attracting skilled and innovative individuals, the company fosters a culture that supports and sustains innovation, while also retaining key personnel.

The board's commitment also impacts the organization's interactions with external stakeholders. Committed board members engage actively with stakeholders, including customers, suppliers, and investors, to gather valuable feedback and insights on innovation initiatives, reflecting the perspectives noted by Akpan (2022). This stakeholder engagement enables the company to navigate the complexities of innovation while incorporating external viewpoints into the innovation process. Moreover, committed boards leverage these relationships to establish strategic partnerships and collaborations, which can enhance the organization's innovation capabilities (Olori & Sylva, 2017). This collaborative approach broadens the company's access to external resources and expertise, while also reinforcing its reputation as an innovative and forward-thinking entity.

Board commitment further strengthens the decision-making process related to innovation. With a range of diverse perspectives and expertise, committed board members contribute to more informed and strategic decision-making. Their deep understanding of industry trends, market shifts, and the competitive landscape enables them to make well-grounded decisions on innovation strategies, investments, and partnerships (Akpan, 2022; Samlal, 2020; Sierra-Morán et al., 2021). As a result, this reduces the risk of costly missteps and increases the likelihood of successful innovation outcomes.

Moreover, board commitment plays a central role in the execution of innovative initiatives. Committed board members provide support, guidance, and accountability throughout the innovation process (Akpan, 2022). They ensure that the necessary resources are allocated, monitor the progress of innovation projects, and hold management accountable for achieving innovation objectives (Sierra-Morán et al., 2021). Their active involvement helps overcome challenges that may arise during the implementation phase, ensuring that innovative ideas are successfully brought to fruition. This aligns with the resource-based view (Barney, 1991), which posits that organizations with access to unique resources and capabilities are better positioned to drive innovation (Chen, 2014). According to this theory, board members act as conduits to external resources that may not be readily available within the company (Sierra-Morán et al., 2021).

The analysis also reveals a statistically significant positive relationship between board compensation and innovation, with a significance level of 0.01%. This finding can be understood through the lens of agency theory, which suggests that executives and board members, motivated by self-interest, are likely to act in ways that enhance their personal wealth and well-being. By offering competitive compensation, organizations align the interests of board members with those of the company, reducing conflicts of interest and creating an environment conducive to innovation. Adequate compensation ensures that board members' material needs are met, allowing them to focus on driving the organization's long-term strategic objectives, including innovation. Furthermore, attractive compensation packages help attract and retain highly skilled individuals who are more likely to contribute to the development and execution of effective innovation strategies. This stability within the board contributes to sustained innovation, as a knowledgeable and experienced workforce is more capable of driving long-term growth and adaptability.

5. CONCLUSION

This comprehensive study offers valuable insights into the relationship between corporate governance ratings and corporate innovation. The findings demonstrate a significant positive correlation between corporate governance ratings and innovation, indicating that organizations with strong governance practices are more likely to engage in innovative activities. In essence, effective corporate governance establishes a framework that guides leadership behavior and decision-making, fosters accountability and transparency, mitigates risks, prevents unethical conduct, builds trust, ensures fair treatment of stakeholders, and cultivates

a positive work environment. Ultimately, it contributes to the long-term sustainability and resilience of the organization. For organizations to achieve their innovation goals, the implementation of effective corporate governance practices is crucial.

Effective corporate governance not only sets the groundwork for guiding leadership behavior but also promotes transparency, accountability, and a positive organizational culture. By committing to ethical standards and strategic decision-making, organizations create an environment conducive to innovation and adaptability. Leaders are encouraged to explore new opportunities and make informed decisions that align with the organization's broader strategic objectives.

Board effectiveness plays a pivotal role in determining a firm's propensity to innovate. A proactive, strategic, and forward-looking board is more likely to encourage and support innovation. This includes having board members who possess deep industry knowledge and an understanding of the firm's competitive landscape. Board diversity also emerges as a critical factor in fostering innovation. Organizations with diverse boards tend to display stronger innovation outcomes, benefiting from a broader range of perspectives, experiences, and expertise, which contribute to innovative thinking and decision-making.

Board commitment and vigilance are equally significant in promoting innovation. Audit committees, through their active engagement in discussions, challenging of the status quo, and provision of constructive feedback, help cultivate a culture of innovation. Their commitment to staying informed about emerging trends and technologies plays a critical role in identifying new innovation opportunities. Additionally, the presence of audit committees strengthens the firm's innovative capacity by ensuring reliable financial reporting and robust internal controls.

Moreover, the compensation offered to board members can influence an organization's inclination toward innovation. Competitive compensation packages that are aligned with the firm's performance and innovation goals attract experienced and capable board members who are motivated to drive innovation. Well-structured compensation also serves as an incentive for board members to support and take risks on innovative initiatives.

The study highlights the positive link between corporate governance ratings and innovation, underscoring the central role of governance in fostering innovative practices within organizations. The implications of the study extend to the board's critical role in shaping a firm's innovation trajectory, emphasizing the importance of a proactive, strategic, and diverse board. Board diversity, commitment, and vigilance—particularly through the work of audit committees—are identified as essential components for fostering a culture of innovation. These elements contribute to open discussions, challenge established norms, and promote transparency and trust, all of which are crucial for creating an environment where innovation can thrive.

Organizations are, therefore, strongly encouraged to implement robust corporate governance practices to advance their innovation objectives. In addition, the compensation provided to the board emerges as a key influence, suggesting that thoughtfully designed compensation packages aligned with innovation goals can attract and motivate experienced board members to drive innovation and support strategic initiatives. Overall, these findings underscore the integral role of corporate governance, board dynamics, and compensation structures in shaping an organization's innovation landscape.

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