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Corporate innovation in eco-aware companies in the ASEAN region: Does the CEO's educational background matter?

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Abstract

Purpose – Corporate innovation has become an undisputed imperative for organizational success, especially for eco-aware companies in a sustainability-focused global landscape. This research aims to investigate the relationship between a chief executive officer (CEO) with reputable university education and corporate innovation in eco-aware companies in the Association of Southeast Asian Nations (ASEAN) region and predicts a positive association between a CEO with reputable university education and corporate innovation.

Design/methodology/approach – This study examines publicly listed eco-aware companies in the ASEAN region. We use regression analysis and conduct a Heckman two-stage and propensity score matching method as robustness analyses.

Findings – The findings indicate a positive association between CEOs with reputable university education and corporate innovation. Additionally, this positive association is significantly stronger in companies that exhibit superior Environmental, Social and Governance (ESG) risk management capabilities and in those operating under higher financial leverage.

Practical implications – The findings suggest that boards should prioritize CEOs with reputable university education to signal credibility in high-leverage firms and strengthen internal ESG infrastructure to effectively translate a CEO's cognitive advantages into tangible innovation.

Originality/value – This study advances upper echelons theory by integrating signaling theory to explain how a CEO with reputable university education facilitates innovation in eco-aware ASEAN firms. We identify critical

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boundary conditions, revealing that this relationship is contingent on internal ESG governance and external financial leverage.

Keywords CEO, Corporate innovation, Eco-aware companies, Governance, Reputable university
Paper type Research article

1. Introduction

Corporate innovation is an ongoing topic in the business field. The advantages it offers make it a frequent subject of discussion. Existing literature highlights the importance of corporate innovation in ensuring a company's survival while meeting stakeholders' demands (Morched *et al.*, 2023). However, in the contemporary business landscape, the scope of corporate innovation has expanded significantly to address global environmental imperatives (Wagner, 2010; Xu *et al.*, 2021). Consequently, accelerating targeted technological innovation has become a critical mechanism to support organizations in achieving a high-quality low-carbon transition (Xia *et al.*, 2025; Xie and Lin, 2026). This highlights the value of fostering innovation for environmental goals by going beyond traditional approaches. This emphasizes how this topic remains relevant even as the goals and focus expand to include sustainability issues. Accordingly, understanding who enables sustainability-oriented innovation has become increasingly important, particularly for firms facing high legitimacy pressure and stakeholder scrutiny.

By moving beyond traditional approaches, innovation emerges as a critical factor in achieving corporate sustainability goals. As the central point of transformation, integrating sustainability into traditional business strategies enables companies to foster sustainable competitive advantage and capitalize on the opportunities presented by changing environments (Sapsanguanboon *et al.*, 2025). This indicates that innovation enables businesses to adopt environmentally friendly practices. As a result, this transformation positions "eco-aware companies" as pioneers in sustainability. Organizations that integrate sustainability into their operations can derive valuable insights by evaluating the framework of eco-aware companies concerning ecological stewardship. Thus, recognizing the essential factors that are associated with innovation in these environmentally conscious firms is crucial for both scholarly research and practical strategy development. In eco-aware firms, innovation is typically pursued amid tighter financial and strategic constraints, which amplifies the importance of leadership-related resources in sustaining innovation efforts (Nguyen and Do, 2025).

Recent management literature emphasizes that innovative organizations rely on leaders who can demonstrate resilience, adapt to dynamic shifts and cultivate an environment conducive to continuous innovation (Hariyani *et al.*, 2025; Nyamboga, 2025). Furthermore, prior literature supports the notion that corporate governance plays a crucial role in promoting corporate innovation. Corporate governance serves as the actor that could create such a mechanism that allows the innovation environment in the company (Rizki *et al.*, 2024; Zhang *et al.*, 2023). Within this governance framework, the chief executive officer (CEO) emerges as the central figure whose distinct attributes substantially influence the firm's strategic direction and capacity for innovation (Nguyen *et al.*, 2023).

We integrate upper echelons theory (UET), specifically the refined framework of Hambrick (2007), with signaling theory to examine the dual mechanism of CEO influence. While UET suggests that a CEO's cognitive framework drives internal strategic choices, signaling theory elucidates how these attributes function as credible external cues to mobilize resources for high-risk innovation. Prior research has explored how CEO attributes, including gender, power, facial characteristics, experience and educational background, are associated with corporate innovation (Cao *et al.*, 2022; Shao *et al.*, 2020; Zaman *et al.*, 2020). Despite research linking various CEO attributes to innovation, the specific role of a CEO with reputable university education remains underexplored as literature primarily focuses on education level and major. This study addresses this gap by investigating how a CEO with reputable university education serves as a strategic signal of competency and network access, which is crucial for

sustaining innovation within the complex stakeholder environments of Association of Southeast Asian Nations (ASEAN) eco-aware firms.

Based on the concept of university rank, the tendency of which university the person attends is an important matter. Reputable universities are often widely recognized for providing high-quality education as their top-tier rankings function as a credible proxy for academic excellence and the ability to deliver superior knowledge (Boholano *et al.*, 2021; Selten *et al.*, 2020). Although the emerging concept of education may seem outdated, some individuals still regard it as a top priority. For instance, policymakers across Southeast Asia are actively implementing policy guidelines to strategically align and enhance their tertiary education institutions (Postiglione and Wright, 2016). By attending prestigious institutions, CEOs gain valuable exposure to intellectual growth and networking opportunities (Aini *et al.*, 2024) that can profoundly influence their perspectives when navigating strategic challenges and opportunities, even amid changing circumstances. In this study, we argue that in eco-aware firms, CEOs with reputable university education can matter less as a "better schooling" story and more as a bundle of mechanisms that helps CEOs mobilize resources under sustainability pressures providing (1) a credible signal of managerial competence to navigate the intense stakeholder scrutiny associated with corporate sustainability (Forcadell *et al.*, 2023) and (2) cognitive imprint and/or human capital that shapes opportunity recognition and risk tolerance for innovation (Wang *et al.*, 2022). Therefore, this research predicts a positive correlation between CEO reputable university education and corporate innovation.

We also expect these mechanisms to be most relevant when resource frictions are higher and governance demands are stronger, such as in firms facing tighter financing constraints or a more developed environmental, social and governance (ESG) risk-management infrastructure. Building on this rationale, we extend our theoretical framework to develop two additional hypotheses that examine the boundary conditions under which a CEO with reputable university education exerts a stronger effect on corporate innovation. Specifically, we hypothesize that this relationship is amplified in firms with stronger ESG risk management capabilities and in firms operating under higher financial leverage. These boundary conditions are theoretically grounded in the complementary roles of organizational conversion capacity and external signaling effectiveness, respectively. This research tests the hypothesis using data from eco-aware companies in the ASEAN region, obtained from Sustainalytics' website for 2022, which includes 411 observations. The findings suggest that a CEO with reputable university education is positively associated with corporate innovation. To address potential endogeneity concerns, a robustness test was performed, yielding strong results. Moreover, further analysis was conducted to examine how this relationship may vary in different contexts.

This study contributes significantly to the literature on executive leadership and corporate strategy in three primary ways. First, it provides a theoretical synthesis by integrating the refined UET with signaling theory. We move beyond simple executive characteristics to explain how a CEO with reputable university education serves as both an internal cognitive driver for opportunity recognition and as an external symbolic signal that reduces information asymmetry and mobilizes innovation resources. Second, we address the modest direct effects often found in leadership studies by establishing a contingency-based empirical framework. We demonstrate that the conversion capacity of a CEO's intellectual capital does not automatically convert into value. Instead, it is strategically unlocked only when it aligns with certain organizational traits. Our findings show that the link to innovation is strongest in firms with robust ESG risk management and higher financial leverage. This highlights the critical role of leadership in managing resource friction. Third, the study offers nuanced, nongeneric practical insights for boards and investors. We specify that recruiting CEOs with reputable university education is a strategic imperative for high-leverage firms to mitigate financing frictions, provided that internal ESG governance infrastructure is robust enough to translate the CEO's strategic foresight into tangible innovation outcomes.

The remainder of this paper is organized as follows. Section 2 reviews the pertinent literature, lays out the theoretical framework and formulates testable hypotheses. Section 3 presents the research methodology and empirical model, including variable construction, data

sources and estimation strategy. Section 4 provides the results and discussions, evaluates robustness through alternative specifications and sensitivity analyses and explores additional analyses that probe mechanisms and heterogeneity. Lastly, Section 5 wraps up the paper by summarizing contributions, acknowledging limitations and outlining promising directions for future research and practice.

2. Literature review and hypothesis development

2.1 Education, reputable university, and ASEAN context

Education has long been acknowledged as a fundamental driver of human development, societal advancement and economic prosperity (Woessmann, 2016). Within higher education frameworks, integrating structured problem analysis is argued to be essential for cultivating students' ability to navigate complexities and uncertainties beyond mere knowledge acquisition (Thomassen and Stentoft, 2020). Specifically within corporate practice, education provides individuals with the critical competencies required to facilitate effective management and complex strategic decision-making (Schank *et al.*, 2025). In executive settings, educational credentials can serve as observable signals of underlying quality and legitimacy, shaping stakeholder assessments when managerial capability is difficult to observe (Connelly *et al.*, 2011; Spence, 1973). Recent scholarship emphasizes that reputable university education can fast-track career trajectories toward top management positions (Salimi *et al.*, 2025) as reputable institutions provide sophisticated human capital signals pivotal for organizational legitimacy and performance (Bessagnet, 2026).

Attending higher education institutions with global recognition has increasingly become a critical indicator of both educational quality and institutional reputation (Escandon-Barbosa and Salas-Paramo, 2023). In reference to the concept of the university ranking system, among the numerous evaluators using various methodologies to obtain scores, there exists a generally accepted benchmark for educational quality and employability. University rankings serve as criteria for evaluating excellence based on factors such as academic and employer reputation, faculty-to-student ratio, research output and internationalization. Elevated rankings are frequently regarded as indicators of quality education, access to advanced research and robust alumni and faculty networks. Beyond instructional quality, reputable universities can operate as symbolic capital that enhances legitimacy and grants access to elite alumni networks, facilitating resource mobilization and coordination in organizational settings (Guo *et al.*, 2025). Recent evidence suggests that prestige reflects the interplay between human and structural capital, helping graduates use their university's reputation to reduce information gaps and boost organizational performance (Bessagnet, 2026).

A preconceived notion has emerged questioning the absolute necessity and value of higher education, suggesting that a university degree is no longer the sole or most important determinant of success. This notion also questions the worth, cost and effort involved in pursuing higher education in a money-making context (Cook *et al.*, 2019). However, in the Asian context, this idea remains somewhat isolated as "the Asian value" still regards education as a key factor in success, and pursuing education from reputable universities holds significant cultural and societal importance (Yeung and Li, 2021). Driven by the demands of a knowledge-based economy, governments across the region have aggressively reformed their higher education systems to elevate their global standing (Mok, 2015). Within the ASEAN context specifically, several member states have made notable progress, with an increasing number of universities consistently breaking into and climbing global top rankings (Moussa Omar *et al.*, 2025). This highlights the growing recognition of a skilled and well-educated workforce as essential for achieving the region's sustainable development goals, promoting innovation-driven economies and improving global competitiveness. However, institutional heterogeneity across the ASEAN region implies that reliance on credibility signals and network-based coordination may vary across countries, potentially amplifying the practical value of a CEO with reputable university education in some environments more than others.

2.2 Innovation in eco-aware companies

Corporate innovation has become an essential necessity for organizational success across all industries. As technology advances, the need for effective and efficient business processes grows even more (Calder *et al.*, 2024). In this dynamic landscape, the convergence of technical leadership and strategic management is increasingly crucial as executives must possess the cognitive capacity to align complex technical innovations with broader corporate sustainability goals (Danesh, 2026). This highlights that innovation is no longer just a strategic choice but a requirement for survival, competitiveness and long-term growth. Specifically, innovation fosters operational resilience, allowing companies to continuously update their products, streamline operations and adapt to unpredictable market changes, thereby ensuring their sustainable corporate longevity (Irawan *et al.*, 2021). Consequently, innovation is a crucial factor in every business sector. In sustainability-oriented settings, innovation warrants separate consideration because it generates "double externality" and creates private benefits while reducing external environmental costs (Holzner and Wagner, 2022). Recent evidence suggests that firms often face a green investment dilemma, where the uncertainty of environmental projects requires strong signaling mechanisms to align corporate actions with emerging environmental norms (Shu *et al.*, 2026). Such investments also tend to involve long innovation cycles and higher uncertainty, increasing financing frictions and making sustained eco-innovation more dependent on complementary external resources and cross-organizational support (Gloria, 2025; Hao *et al.*, 2022).

Alongside the demand for innovation, environmentally conscious companies have become essential in proactively addressing global environmental challenges, marking a significant shift in corporate responsibility (Bae and Kim, 2022; Shah *et al.*, 2020). These companies go beyond just following environmental rules but also actively integrate environmental concerns into their core business strategies, operations and product development. They view environmental responsibility not just as a regulatory obligation or cost but as a strategic opportunity to create long-term value, enhance brand reputation and gain a competitive advantage. For these companies, corporate innovation is a crucial tool. Strong innovation enables them to develop more resource-efficient production methods, create eco-friendlier products and services, stay ahead of evolving green technologies and reduce environmental risks (Arranz *et al.*, 2020; Siedschlag and Meneto, 2022). Therefore, a company's commitment to innovation is essential for improving environmental performance, achieving sustainability goals and maintaining long-term viability and leadership in the green economy. Because eco-innovation is often pursued to build or sustain legitimacy with investors and exchange partners, and because its long-horizon returns heighten exposure to financing constraints, leadership-linked social and cognitive resources may be particularly consequential in eco-aware firms (Yu *et al.*, 2021).

2.3 Theoretical framework and hypothesis development

Drawing upon UET developed by Hambrick (2007), firm outcomes reflect top executives' cognitive bases, values and experiences, which shape strategic choices, including innovation-related decisions. In high-stakes environments where information asymmetry is prevalent, the reputation of a CEO's reputable education serves as a potent signal of quality and competence (Gounopoulos *et al.*, 2021). Prior research links executive attributes, such as gender, educational background, facial features and experience, to corporate financial performance as well as sustainability and innovation outcomes (Alderman *et al.*, 2022; Cao *et al.*, 2022; Hrazdil *et al.*, 2021; Kind *et al.*, 2023; Li *et al.*, 2019; Octavio *et al.*, 2025; Rizki *et al.*, 2024; Zaman *et al.*, 2020). Recent CEO–innovation studies show that executive attributes and incentives shape innovation outcomes, including evidence from private sector settings (Lin *et al.*, 2011), individual life experiences (Sunder *et al.*, 2017) and culturally rooted CEO orientations (Gao *et al.*, 2023).

In this context, educational backgrounds may matter not only because they reflect superior cognitive resources and strategic capacity but also because they serve as credible external signals that reduce information asymmetry and help firms obtain support from investors, creditors and strategic partners. Integrating UET and signaling theory, we propose that this prestige signal functions as a bridge to the firm's capital structure by acting as a proxy for risk management competence. Specifically, it reduces the perceived default risk among external creditors, thereby facilitating higher financial leverage. Such external support is especially valuable for innovation, given its uncertainty, long gestation period and dependence on sustained resource commitment. Consequently, by addressing these layered mechanisms, this research fills a critical gap as existing literature still pays limited theoretical attention to how a CEO with reputable university education influences innovation-relevant strategic choices through financial resource mobilization.

Effective leadership is crucial for driving organizational change and fostering a culture of innovation. Leaders who can adapt to new challenges, demonstrate resilience through uncertainties and think critically are more likely to boost corporate innovation (Calder *et al.*, 2024). Based on this idea, a CEO with reputable university education is believed to significantly contribute to developing these essential leadership qualities. Reputable university education builds a strong cognitive foundation, providing leaders with better analytical skills, strategic foresight and interdisciplinary thinking skills necessary for recognizing and exploiting complex innovation opportunities, including considerations of sustainable development. As key decision-makers, CEOs play a vital role in shaping a company's innovation path.

Building a layered theoretical framework, we argue that a CEO with reputable university education relates to eco-innovation through three complementary channels. First, drawing on signaling theory, reputable university education can function as an observable cue of executive credibility and legitimacy, shaping how external audiences evaluate the firm and reducing perceived uncertainty around sustainability-oriented investments and long-horizon innovation commitments (Saeed and Wiredu, 2025). This is particularly vital in green finance, where positive market signals have been shown to significantly reduce financing costs and information asymmetry, thereby attracting specialized green capital (Khalid *et al.*, 2025; Li *et al.*, 2026). Critically, this signaling mechanism serves as a bridge between a CEO with reputable university education and the firm's innovation. From a signaling perspective, a CEO with reputable university education acts as a proxy for superior risk management competence, which reduces the perceived default risk among external creditors (Gounopoulos *et al.*, 2021). This credibility facilitates higher financial leverage, allowing eco-aware firms to secure the substantial debt financing required to sustain capital-intensive innovation projects that would otherwise be hindered by financing frictions (Khalid *et al.*, 2025; Li *et al.*, 2026). Second, reputable university education can shape executives' cognitive bases, problem-framing capacity and strategic risk preferences, thereby supporting opportunity recognition and sustainability-oriented innovation (Hambrick, 2007). The specialized training provided by reputable universities enhances a leader's ability to manage high-uncertainty research and development projects. It effectively reduces the perceived risk associated with radical eco-innovation investments (Gounopoulos *et al.*, 2021). CEOs with reputable university educations may be better equipped to process complex information, evaluate emerging environmental opportunities and make forward-looking strategic decisions under uncertainty. At the same time, to provide a balanced argument, behavioral theories warn that an over-reliance on prestige-related cues can generate trade-offs; specifically, "prestige bias" can distort objective judgment and lead to the adoption of maladaptive risks (Jiménez and Mesoudi, 2019). One important potential downside is managerial overconfidence. While recent evidence demonstrates that CEOs with reputable university education are highly capable of creating positive shareholder value during complex strategic expansions, such as mergers and acquisitions (Nguyen *et al.*, 2025), there remains a theoretical concern that their elite status may simultaneously foster hubris. This overconfidence can encourage executives

to overestimate the potential benefits of high-risk investments while underweighting downside risks, leading to overly ambitious initiatives. Indeed, recent innovation literature highlights the paradoxical effects of executive hubris: While CEO overconfidence can spur exploratory experimentation and strengthen the initial incentives to invest in radical innovation, it can also become detrimental by undermining the internal effectiveness of the innovation process, making the net organizational outcome theoretically ambiguous ex ante (Howard *et al.*, 2024). Thus, this research predicts a positive association as attending reputable universities allows CEOs to leverage their advanced intellectual capital and networks to identify cutting-edge green technologies, forge partnerships for sustainable development and steer the organization through strategic shifts needed for eco-innovation.

H1. There is a positive relationship between CEOs with reputable university education and corporate innovation in eco-aware companies.

2.3.1 The role of organizational ESG risk management capabilities. While H1 establishes a direct positive effect of CEOs with reputable university education on corporate innovation, this relationship likely varies across organizational contexts. UET (Hambrick, 2007) posits that executive cognitive resources must be channeled through corporate processes to produce tangible outcomes. In this regard, a firm's internal governance infrastructure acts as a critical conversion mechanism. We argue that ESG risk management capabilities constitute one such mechanism that amplifies the positive impact of CEOs with reputable university education on corporate innovation.

These capabilities reflect an organization's capacity to identify, assess and mitigate ESG-related risks systematically. Firms with superior ESG risk management possess the governance infrastructure, data systems and stakeholder protocols necessary to support complex, long-horizon innovation projects (Li and Li, 2024; Ma *et al.*, 2022). This infrastructure reduces internal frictions that impede strategic execution; without these systems, even a cognitively sophisticated CEO may be constrained in evaluating and executing sustainability-oriented initiatives.

This interplay can also be explained via signaling theory. While a CEO with reputable university education signals managerial quality externally to enhance legitimacy and capital access, this signal requires substantiation by internal governance. External stakeholders interpret executive education as a genuine indicator of innovation quality only when robust ESG risk management confirms the firm's sustainable commitments (Forcadell *et al.*, 2023). Thus, ESG governance serves as an internal validator that reinforces the CEO's external signaling value.

Importantly, ESG risk management is highly relevant to our eco-innovation context. Unlike generic governance metrics, it directly captures how an organization manages the specific environmental and social risks that eco-innovation aims to address (Siedschlag and Meneto, 2022). Prior evidence confirms that robust ESG governance improves green innovation quality by mitigating resource misallocation and aligning investments with long-term sustainability (Ma *et al.*, 2022).

Consequently, this synergistic effect heavily depends on the firm's actual ESG performance level. In firms with weak ESG capabilities, the lack of operational infrastructure invalidates the managerial signal, weakening the CEO's capacity to drive innovation. Conversely, in firms exhibiting exemplary environmental and social performance, the alignment between executive cognitive capacity and organizational readiness peaks. We therefore expect this positive relationship to be most pronounced within these high-capability firms.

H2. The positive relationship between CEOs with reputable university education and corporate innovation is stronger in firms with superior ESG risk management capabilities.

2.3.2 The role of financial leverage context. A second contingency affecting the impact of a CEO with reputable university education on corporate innovation relates to the firm's capital

structure, specifically its financial leverage. Financial leverage, the debt-to-equity ratio or total assets, determines a firm's financial flexibility, cost of capital and exposure to creditor monitoring (Botta, 2020; Brusov and Filatova, 2023). Grounded in signaling theory, we argue that the innovative effect of a CEO with reputable university education is amplified under heightened financial leverage.

Highly leveraged firms face intense scrutiny from debt holders seeking assurance that management can service debt while pursuing long-term, risky strategic investments (Gounopoulos *et al.*, 2021). In these settings, information asymmetry between the firm and capital providers constrains the financing of capital-intensive research and development (R&D). CEOs with reputable university education mitigate this asymmetry by providing a credible, observable signal of managerial quality. This educational credential serves as a proxy for risk-management competence, reducing perceived default risk and securing the debt financing necessary to sustain innovation (Khalid *et al.*, 2025; Li *et al.*, 2026).

Leverage plays a unique role as an external financing constraint that simultaneously demands credible leadership signaling and pressures strategic investment. Capital structure theory notes an inherent tension between immediate debt obligations and the uncertain, long-horizon nature of R&D (Hao *et al.*, 2022). A CEO with reputable university education resolves this tension by reinforcing executive credibility with lenders, thereby maintaining R&D funding even under distress. Conversely, low-leverage firms face fewer financing frictions, rendering the signaling value of executive education less critical.

From an upper echelon's perspective, the cognitive and strategic acumen developed at reputable universities is particularly valuable under high leverage, which demands sophisticated risk assessment and creditor negotiation. Highly educated CEOs are better equipped to navigate these complex environments and optimize constrained resources. This mechanism implies an asymmetry based on debt exposure. In low-leverage firms where financial pressure is minimal, the marginal utility of educational signaling diminishes. However, as financial constraints intensify, reliance on credible leadership becomes paramount to preserve creditor confidence and safeguard R&D allocations. Together, these internal and external mechanisms suggest that the positive relationship between a CEO with reputable university education and corporate innovation is most pronounced within high-leverage firms.

H3. The positive relationship between a CEO with reputable university education and corporate innovation is stronger in firms with higher financial leverage.

3. Methodology

3.1 Sample selection and data sources

This study uses a sample of publicly traded companies in the ASEAN region rated by Sustainalytics in 2022. These companies are referred to as "eco-aware companies," a designation based on Sustainalytics, a third-party ESG rating agency. Employing a third-party validated measure of a firm's dedication to sustainability ensures methodological rigor in our sample selection. The choice of Sustainalytics as the assessing organization reflects a strategic and proactive integration of environmental factors aimed at reducing future liabilities and enhancing long-term value. The selected year was chosen based on the availability of data. Because Sustainalytics only provides updated data, the study uses observations corresponding to the year in which the data were collected. The initial data gathered consisted of 575 observations. After removing the observations with missing values, the final sample comprises 411 observations. The applicable sample criteria used to obtain the final sample are provided in Table 1.

Table 2 displays the data tabulation for this research. Panel A illustrates the distribution of CEOs with reputable university education (CEO_RU) across various countries. Notably, less than half of the sample comprises CEOs with reputable university education. Specifically, only

Table 1. Sample selection criteria

Description	Total
Listed companies rated by Sustainalytics in ASEAN	575 observations
Less	
Missing data: CEO from Reputable University	63 observations
Missing data: Control variables	101 observations
Final sample	411 observations

Source(s): Authors' own work

Table 2. Data tabulation

Panel A: Distribution of CEOs from reputable universities across the country

	CEO_RU Nonreputable university		Reputable university		Total
Country					
Indonesia	84	80%	21	20%	105
Malaysia	59	58%	43	42%	102
Philippines	28	70%	12	30%	40
Singapore	12	27%	33	73%	45
Thailand	101	87%	15	13%	116
Vietnam	2	67%	1	33%	3
Total	286	70%	125	30%	411

Panel B: Distribution of CEOs from reputable universities across the industry

	CEO_RU Nonreputable university		Reputable university		Total
Industry (SIC)					
SIC 0: Agriculture, forestry, fishing	10	59%	7	41%	17
SIC 1: Mining and construction	37	77%	11	23%	48
SIC 2: Manufacturing (1)	40	71%	16	29%	56
SIC 3: Manufacturing (2)	37	69%	17	31%	54
SIC 4: Transportation and public utilities	50	76%	16	24%	66
SIC 5: Wholesale trade	28	76%	9	24%	37
SIC 6: Financial services	56	60%	38	40%	94
SIC 7: Services (1)	14	70%	6	30%	20
SIC 8: Services (2)	13	72%	5	28%	18
SIC 9: Public administration	1	100%	0	0%	1
Total	286	70%	125	30%	411

Source(s): Authors' own work

125 out of 411 (30%) of the CEOs attended reputable universities, while 286 out of 411 (70%) graduated from nonreputable universities. The distribution indicates that Singapore has the highest percentage of CEOs with reputable university education. In total, 33 out of 45 CEOs in Singapore (73%) attended reputable universities. Singapore invests heavily in education, fostering academic excellence and attracting top talent to both local and global universities. The high proportion of CEOs with reputable university education reflects its advanced educational infrastructure, its status as a global business hub and its focus on sectors requiring academic rigor and professional credentials. In contrast, Indonesia and Thailand rank as the lowest two countries for CEOs with reputable university education, with only 20% and 13%, respectively.

Panel B of Table 2 illustrates the distribution of CEOs with reputable university education across various industries. In the sectors defined by the Standard Industrial Classification (SIC), the Agriculture, Forestry and Fishing industry (SIC 0) emerges as the sector with the highest proportion of CEOs with reputable university education, accounting for 7 out of 10 (41%) CEOs. This trend may occur because modern agriculture and its related fields are considerably more complex than traditional farming. Reputable universities often offer leading programs in agricultural science, providing advanced education to students (Soam *et al.*, 2023). Following this, the financial service industry ranks second, with 38 out of 94 (40%) CEOs holding reputable university education. In contrast, the public administration occupies the last position, with no CEOs holding reputable university credentials.

3.2 Variable definition and measurement

Dependent variable. Corporate innovation served as the dependent variable for this study. Following prior research, corporate innovation is measured by R&D intensity, calculated using the ratio of R&D expense divided by total assets, which is then represented by RNDTA. Before conducting the division, the value of R&D is set to 0 when the original value is not identifiable in the report. Koh and Reeb (2015) explained how some companies do not report R&D due to factors like managerial discretion, where firms may not classify certain expenditures as R&D, especially if activities are outside formal units or strategically concealed to protect proprietary information. Additionally, immateriality judgments and joint ventures in R&D can lead to treating missing R&D as zero.

Independent variable. The independent variable is a dummy variable representing the extent to which a CEO holds reputable university education (CEO_RU) (Aini *et al.*, 2024). Adapting the measurement approach from prior literature, we utilize the 2022 QS World University Rankings (QS WUR) as the global benchmark to identify reputable institutions. A CEO is assigned a value of 1 if their alma mater is recognized within the QS WUR and 0 otherwise. While the rankings encompass approximately 1,300 institutions worldwide, this binary approach is specifically designed to distinguish globally recognized universities from those without international ranking status. In the ASEAN context, inclusion in the QS WUR serves as a high-threshold signal of institutional quality and academic rigor compared to nonglobal institutions. Data are collected manually from the company's annual report, website and LinkedIn profile.

Control variables. Several control variables were utilized in this study to account for various factors that might be associated with the relationship. First, the governance factor is controlled using the CEO's age (AGE) and auditor choices (BIG4). Second, firm characteristics are controlled using the size (FSIZE) and age (FAGE) of the firm. Third, the financial factor is controlled using the tangibility ratio (TANG), return on equity and cash ratio (CASHEQ). Fourth, the contextual setting of eco-aware companies is controlled using the ESG risk score achieved by the firm by Sustainalytics (SCORE). Lastly, the country-level factor is controlled using gross domestic product. In addition, the differences in industry and country are controlled using fixed effects (FE). A summary of the variables used in this study is provided in Appendix I.

3.3 Research design

This study adopts a multistaged identification strategy to rigorously test the hypothesis. The baseline analysis uses ordinary least squares (OLS) regression with country- and industry-fixed effects to control for unobserved heterogeneity. Prior to estimation, all continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers (Reifman and Garrett, 2010). To address potential endogeneity concerns inherent in cross-sectional data and the absence of lagged variables, this study uses a rigorous econometric framework beyond OLS. We use the Heckman two-stage method to reduce sample selection bias. We also use propensity score matching (PSM) to ensure that associations are not

influenced by systematic differences in firm characteristics. This supports the validity of the relationship between CEOs with reputable university education and corporate innovation. The equation model is constructed as follows:

$$RNDTA_i = \alpha + \beta_1 CEO\_REP_i + \beta_{2-9} CONTROLS_i + Industry\ FE + Country\ FE + \varepsilon$$

4. Results and discussion

4.1 Descriptive statistics and univariate analysis

The results of the descriptive analysis of the sample are presented in Table 3. The independent variable, CEOs with reputable university education, has a mean of 0.312, indicating that 31.2% of the CEOs in the sample hold a degree from a reputable university. This finding suggests that CEOs with reputable university education is not a majority characteristic among the top leadership in these firms. Meanwhile, corporate innovation shows a mean of 0.001, which indicates that, on average, companies in the sample allocate only 0.1% of their total assets to R&D activities.

Table 4 presents the Pearson correlation matrix for the entire sample, highlighting the relationships between variables before conducting regression analysis. The correlation between RNDTA and CEO_RU is positive and statistically significant at the 10% level ($coeff = 0.083$, $p < 0.1$), suggesting a weak but positive association between CEOs with reputable university education and corporate innovation. Therefore, in the subsequent analysis, the control variable should be included. Furthermore, the correlation coefficients among the explanatory variables do not exceed 0.5, suggesting that multicollinearity is unlikely to be a concern. This is further supported by the variance inflation factor values, which are all below the conventional threshold of 5, indicating that multicollinearity does not pose a serious issue in the regression model.

Table 5 displays the results of an independent *t*-test comparing companies with CEOs holding reputable university educations to those without. There were significant differences in corporate innovation between the two groups. Regarding eco-aware companies, the risk rating scores differ significantly. Companies led by CEOs with reputable university education have a mean score of 25.382, while those led by nonreputable CEOs score 28.667. This suggests that companies with CEOs with reputable university education tend to manage their ESG-related risks more effectively.

Table 3. Descriptive statistics

Variables	Mean	Median	Minimum	Maximum
CEO_RU	0.312	0.000	0.000	1.000
RNDTA	0.001	0.000	0.000	0.166
AGE	4.033	4.043	3.497	4.477
BIG4	0.761	1.000	0.000	1.000
FSIZE	21.105	20.997	16.543	24.918
FAGE	33.146	30.000	1.000	135.000
TANG	0.278	0.255	0.000	0.908
ROE	0.131	0.095	−1.010	4.845
CASHEQ	0.135	0.098	0.000	0.899
SCORE	27.346	26.800	6.200	54.600
GDP	13.253	13.054	10.308	14.092

Source(s): Authors' own work

Table 4. Matrix correlation

		[1]	[2]	[3]	[4]	[5]
[1]	*CEO_RU*	1.000				
[2]	*RNDTA*	0.083*	1.000			
		(0.091)				
[3]	*AGE*	−0.187***	−0.047	1.000		
		(0.000)	(0.343)			
[4]	*BIG4*	0.019	0.016	−0.059	1.000	
		(0.697)	(0.750)	(0.234)		
[5]	*FSIZE*	0.035	0.113**	0.046	0.231***	1.000
		(0.481)	(0.022)	(0.354)	(0.000)	
[6]	*FAGE*	−0.054	0.109**	0.168***	0.090*	0.173***
		(0.272)	(0.027)	(0.001)	(0.069)	(0.000)
[7]	*TANG*	−0.133***	0.020	0.033	−0.002	−0.053
		(0.007)	(0.680)	(0.507)	(0.960)	(0.281)
[8]	*ROE*	−0.085*	0.206***	0.055	0.046	0.114**
		(0.083)	(0.000)	(0.268)	(0.350)	(0.020)
[9]	*CASHEQ*	0.065	−0.016	−0.107**	−0.048	−0.069
		(0.186)	(0.746)	(0.030)	(0.331)	(0.160)
[10]	*SCORE*	−0.160***	−0.078	0.143***	−0.126**	−0.058
		(0.001)	(0.112)	(0.004)	(0.011)	(0.240)
[11]	*GDP*	−0.154***	0.061	−0.083*	−0.169***	−0.080
		(0.002)	(0.217)	(0.090)	(0.001)	(0.105)

		[6]	[7]	[8]	[9]	[10]	[11]
[6]	*FAGE*	1.000					
[7]	*TANG*	−0.144***	1.000				
		(0.003)					
[8]	*ROE*	0.064	0.063	1.000			
		(0.195)	(0.200)				
[9]	*CASHEQ*	−0.089*	−0.113**	0.078	1.000		
		(0.070)	(0.022)	(0.115)			
[10]	*SCORE*	0.049	0.226***	−0.008	0.052	1.000	
		(0.318)	(0.000)	(0.869)	(0.295)		
[11]	*GDP*	0.033	0.127**	0.077	0.074	0.228***	1.000
		(0.509)	(0.010)	(0.120)	(0.135)	(0.000)	

Note(s): *p*-values are given in parentheses
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source(s): Authors' own work

4.2 Baseline regression results

Using the OLS regression method, the baseline regression analysis was conducted, with the results displayed in Table 6. Column 1 shows the regression result for only the two primary variables of this study (CEOs with reputable university education and corporate innovation), indicating no significant relationship between them. However, Column 2 shows a significant change: After incorporating a set of control variables, a positive association emerges at the 10% significance level (coefficient = 0.002, *t*-statistic = 1.82). Furthermore, Column 3 presents the results after incorporating both the control variables and the fixed effects; the positive association remains significant at the 10% level (coefficient = 0.002, *t*-statistic = 1.76). In economic terms, the coefficient indicates that firms led by CEOs from reputable universities exhibit a 0.2% higher corporate innovation, as measured by R&D intensity. When compared to the sample mean R&D intensity of 0.1% (see Table 3), this represents a twofold increase, suggesting that a reputable university education is a meaningful

Table 5. Independent *t*-test

	CEO_RU Reputable university	Nonreputable university	Coeff	*t*-value
RNDTA	0.002	0.001	0.002*	1.695
AGE	3.984	4.052	−0.068***	−3.866
BIG4	0.768	0.750	0.018	0.390
FSIZE	21.249	21.148	0.101	0.706
FAGE	33.000	35.396	−2.396	−1.099
TANG	0.250	0.317	−0.067***	−2.712
ROE	0.096	0.139	−0.043*	−1.738
CASHEQ	0.151	0.133	0.018	1.325
SCORE	25.382	28.667	−3.286***	−3.280
GDP	13.173	13.333	−0.160***	−3.160

Source(s): Authors' own work

Table 6. Baseline regression analysis

Variables	(1) *RNDTA*	(2) *RNDTA*	(3) *RNDTA*
CEO_RU	0.001	0.002*	0.002*
	(1.52)	(1.82)	(1.76)
AGE		−0.003	−0.003
		(−1.14)	(−0.86)
BIG4		−0.001	−0.001
		(−0.76)	(−0.75)
FSIZE		0.001	0.001*
		(1.52)	(1.68)
FAGE		0.000**	0.000**
		(2.19)	(2.05)
TANG		0.002	0.002
		(1.10)	(0.73)
ROE		0.008***	0.009***
		(4.11)	(4.00)
CASHEQ		−0.001	−0.003
		(−0.40)	(−0.68)
SCORE		−0.000	−0.000
		(−1.38)	(−1.46)
GDP		0.168	0.001
		(1.38)	(0.29)
Constant	0.001	0.001	−0.023
	(1.21)	(0.09)	(−0.32)
Industry FE	*Excluded*	*Excluded*	*Included*
Country FE	*Excluded*	*Excluded*	*Included*
R^2	0.005	0.079	0.102
Adjusted R^2	0.003	0.058	0.049
Observations	411	411	411

Note(s): *t*-statistics are given in parentheses
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source(s): Authors' own work

driver of innovation commitment in resource-constrained eco-aware firms. While the R^2 of 10.2% reflects that leadership attributes account for a specific share of innovation variance, the

results underscore the necessity of accounting for unobserved heterogeneity to reveal the true influence of executive background. This pattern offers initial support for our integrated theoretical framework, suggesting that CEOs with reputable university education may serve as a strategic signal for resource mobilization.

The findings reveal a positive link between CEOs with reputable university education and corporate innovation, aligning with an integrated framework of UET and signaling theory. Internally, reputable university education enhances a CEO's cognitive capacity and strategic foresight, enabling them to navigate complex innovation challenges, as suggested by the upper echelon's perspective. Externally, a CEO with reputable university education functions as a powerful signaling mechanism that reduces information asymmetry, thereby securing the stakeholder trust and resource mobilization necessary to sustain high-risk innovation. Accordingly, these empirical results provide indicative evidence to support our hypothesis, suggesting that a CEO with reputable university education is associated with higher levels of corporate innovation.

4.3 Robustness analysis

To address potential self-selection bias arising from the nonrandom nature of executive-firm matching, we implemented a Heckman two-stage selection method (Table 7). In the first stage, we use the industry-median CEO overseas experience (Med_CEORU) as an instrumental variable, defined as the median overseas experience among all CEOs in the same industry within a given year. This isolates the influence of a CEO with reputable university education from firm-specific selection factors. The positive and significant association between Med_CEORU and CEO_RU at the significant level of 1% (coeff = 1.306, *t*-statistics = 2.868) indicates that the instrument is strongly correlated with the endogenous variable CEO_RU, which influences the sample selection for corporate innovation data.

The second stage examines the relationship between CEO_RU and RNDTA, accounting for potential sample selection bias. The findings reveal that CEO_RU is positively and significantly related to corporate innovation at a 10% significance level (coefficient = 0.002, *t*-statistic = 1.68), supporting the baseline regression results. The insignificance of the inverse Mills ratio (MILLS) indicates that, although sample selection was modeled, there is no statistically significant evidence of selection bias affecting the relationship between CEO_RU and RNDTA. Therefore, this supports the robustness of the results.

To reduce bias from differences between firms we cannot observe directly (unobserved heterogeneity), we use PSM, a method that pairs each treated company with one similar untreated company using 1:1 matching (105 observations per group). Panel A of Table 8 shows that the matched sample exhibits comparable characteristics across all control variables, indicating that systematic differences between the two groups are substantially reduced. Panel B of Table 8 further shows that CEO_RU remains positively associated with corporate innovation, confirming the robustness of our baseline findings. Figure 1 presents the kernel density distribution of propensity scores before and after matching, showing a substantial reduction in differences between the treatment and control groups. In addition, Figure 2 illustrates the covariate balance before and after matching, providing further evidence that the matching procedure effectively improves comparability between the groups. Overall, these results suggest that our findings are unlikely to be driven by self-selection bias.

4.4 Additional analysis

4.4.1 Top eco-aware companies. To further examine the main finding and test H2, this additional analysis explored whether the positive link between a CEO with reputable university education and corporate innovation differs across various levels of a company's sustainability performance. The sample was split into groups based on their Sustainalytics' ESG Risk Ratings to assess if a CEO with reputable university education has a different association with innovation in firms with strong versus weak ESG risk management. Table 9

Table 7. Heckman two-stage test

Variables	First stage *CEO_RU*	Second stage *RNDTA*
CEO_RU		0.002*
		(1.68)
Med_CEORU	1.306***	
	(2.868)	
MILLS		−0.002
		(−0.47)
AGE	−1.537***	−0.001
	(−3.364)	(−0.17)
BIG4	0.021	−0.001
	(0.114)	(−0.74)
FSIZE	−0.010	0.001*
	(−0.163)	(1.67)
FAGE	−0.003	0.000**
	(−0.723)	(2.10)
TANG	−0.056	0.002
	(−0.139)	(0.75)
ROE	−0.726*	0.010***
	(−1.812)	(3.20)
CASHEQ	0.762	−0.003
	(1.294)	(−0.81)
SCORE	−0.021**	−0.000
	(−2.335)	(−0.83)
GDP	−0.123	0.002
	(−0.177)	(0.35)
Constant	7.707	−0.032
	(0.774)	(−0.44)
Industry FE	*Included*	*Included*
Country FE	*Included*	*Included*
R^2 *(Pseudo* R^2*)*	0.210	0.103
N	411	411

Note(s): *t*-statistics are given in parentheses
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source(s): Authors' own work

presents the results of this analysis. Column 1 shows the sample of companies with top ESG scores, revealing a positive relationship between CEO_RU and RNDTA at the 10% significance level (coeff = 0.008, $t = 1.73$). In contrast, Column 2, which represents the low-score sample, indicates no significant association between CEO_RU and RNDTA.

The differences observed between the "top-score" and "low-score" subsamples offer an important nuance to our main conclusion, providing support for H2. They indicate that the positive link between a CEO with reputable university education and corporate innovation depends on the company's existing ESG risk management capabilities. From an upper echelon's perspective, the cognitive and strategic advantages gained from a reputable university education are most effective when the organization possesses the internal "conversion capacity," specifically strong governance, to translate a CEO's strategic foresight into tangible innovation. Simultaneously, through the lens of signaling theory, while a CEO with reputable university education serves as a credible signal of quality to external investors, this signal is most potent when backed by robust internal ESG infrastructure that validate the firm's commitment to sustainable growth. Consequently, the external reputational and network advantages associated with a CEO with reputable university education are more likely

Table 8. Propensity score matching (PSM)

Panel A: Balance test and matching results

Variables	Mean Treated (n = 105)	Control (n = 105)	%bias	t-value	p-value
AGE	4.010	4.005	2.96	0.2141	0.831
BIG4	0.762	0.829	−16.49	−1.195	0.233
FSIZE	21.236	21.229	0.55	0.040	0.968
FAGE	34.114	35.143	−4.85	−0.352	0.725
TANG	0.257	0.280	−10.30	−0.747	0.456
ROE	0.099	0.093	3.46	0.251	0.802
CASHEQ	0.147	0.131	11.40	0.826	0.410
SCORE	26.208	26.293	−0.92	−0.067	0.946
GDP	13.195	13.201	−1.27	−0.092	0.927

Panel B. Results using matched sample

Variables	(1) *RNDTA*
CEO_RU	0.003*
	(1.66)
Constant	−0.075
	(−0.85)
Controls	*Included*
Industry and country FE	*Included*
R^2	0.226
Adjusted R^2	0.148
Observations	210

Note(s): ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. t-values of the regression coefficients appear in parentheses

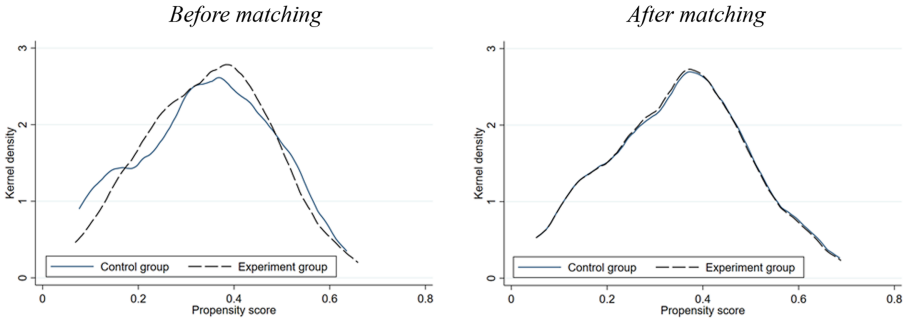

Figure 1. Kernel density curve

to reduce information asymmetry and mobilize resources when the firm's internal systems are proficient at channeling those advantages into effective, high-quality innovation outcomes (Li and Li, 2024; Ma *et al.*, 2022).

4.4.2 Leverage ratio level. The source of funding is a crucial factor that could determine the innovation level in the company. A company's capital structure profoundly influences its financial flexibility, cost of capital and ability to undertake such strategic investments (Botta, 2020; Brusov and Filatova, 2023). To explore if the financial constraints could differ in the role

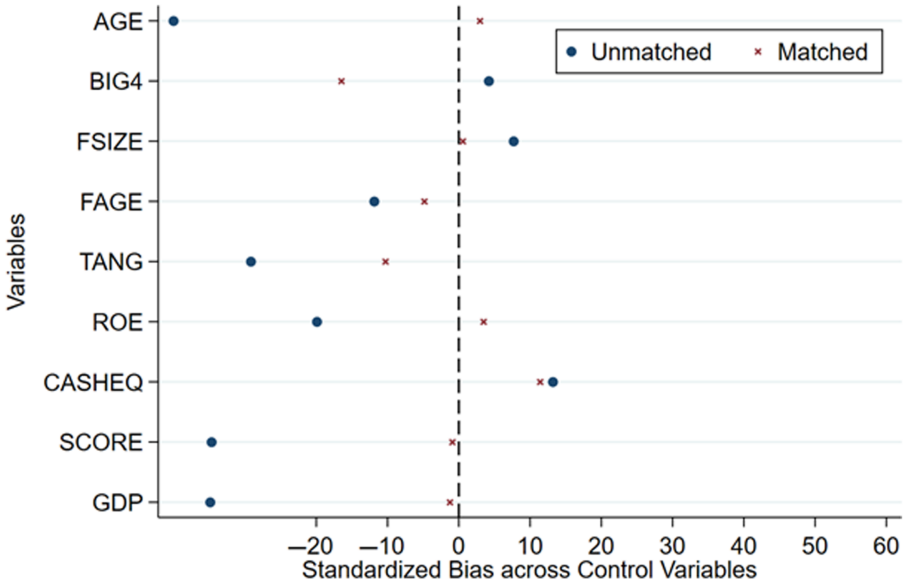

Figure 2. Covariate bias before and after propensity score matching

of a CEO with reputable university education in corporate innovation, the sub sample analysis is conducted by dividing the sample into high and low levels of leverage ratio. Table 10 presents the results of this analysis. Column 1 shows the sample of companies with top ESG scores, revealing a positive relationship between CEO_RU and RNDTA at the significance level of 10% (coeff = 0.008, t = 1.73). In contrast, Column 2, representing the low-score sample, indicates no significant association between CEO_RU and RNDTA.

The different results seen at various leverage levels offer support for H3 and provide a glimpse into when a CEO with reputable university education truly benefits a company's innovation efforts. It is notable that the positive link between a CEO with reputable university education and innovation is only pronounced in firms with high leverage. This suggests that the leadership qualities, in line with upper echelon's perspectives, developed through a reputable university education become especially valuable when companies are dealing with more financial constraints or higher debt levels. During such times, a CEO with reputable university education can be a significant asset in helping navigate financial challenges. Their increased credibility, strategic insights and broad networks have become especially helpful in securing and managing long-term R&D investments, particularly when external pressures and financial risks are high. Consistent with signaling theory, a CEO with reputable university education may reduce financing frictions by strengthening the CEO's credibility in the eyes of capital providers, a mechanism that is particularly valuable for high-leverage firms seeking to sustain long-horizon innovation.

5. Conclusion

This study examines the relationship between a CEO with reputable university education and corporate innovation in eco-aware companies in the ASEAN region. The findings suggest that in eco-aware companies, a CEO with reputable university education is positively associated with increased innovation (H1). This finding aligns with UET, highlighting that CEOs' educational backgrounds shape innovation-related strategic choices and resource allocation. Furthermore, the results of the additional analyses provide evidence supporting the two

Table 9. Additional analysis – top sustainable companies

Variables	RNDTA (1) Top-score	(2) Low-score
CEO_RU	0.008*	0.000
	(1.73)	(0.68)
AGE	−0.009	−0.001
	(−0.75)	(−0.53)
BIG4	−0.003	0.000
	(−0.65)	(0.09)
FSIZE	0.001	0.000
	(0.91)	(1.12)
FAGE	0.000	0.000
	(1.10)	(0.30)
TANG	0.011	−0.000
	(0.93)	(−0.12)
ROE	0.031***	−0.001
	(3.64)	(−0.81)
CASHEQ	−0.004	−0.001
	(−0.27)	(−0.35)
SCORE	0.000	−0.000
	(0.30)	(−1.12)
GDP	0.005	0.000
	(0.70)	(0.04)
_cons	−0.085	−0.001
	(−0.69)	(−0.02)
Industry FE	Yes	Yes
Country FE	Yes	Yes
r2	0.342	0.063
r2_a	0.150	−0.011
N	94	317

Note(s): *t*-statistics are given in parentheses
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source(s): Authors' own work

boundary conditions. First, consistent with H2, the positive association between a CEO with reputable university education and corporate innovation is significantly stronger in firms with superior ESG risk management capabilities, underscoring the role of organizational "conversion capacity" in translating a CEO's cognitive advantages into tangible eco-innovation. Second, consistent with H3, the relationship is also amplified in high-leverage firms, highlighting the critical signaling role of a CEO with reputable university education in reducing information asymmetry with creditors and sustaining innovation under financial pressure. The analysis was further supported by robustness checks, which provided consistent support for these main results.

This research offers important insights for both academic and practical fields by suggesting that a CEO with reputable university education is a potential driver of corporate innovation, functioning as a strategic mechanism for legitimacy-building and resource mobilization. Theoretically, this study advances UET by proposing that reputable institutions serve as rigorous filters for complex information-processing capabilities, challenging the conventional view that field experience alone is sufficient to manage innovation uncertainty. By further identifying ESG risk management capabilities and financial leverage as key boundary conditions, this study establishes a theoretically grounded contingency framework that specifies when a CEO with reputable university education exerts the greatest innovating effect, contributing to a more nuanced understanding of the CEO and innovation nexus. Practically,

Table 10. Additional analysis – capital structure

Variables	RNDTA (1) High leverage	(2) Low leverage
CEO_RU	0.007*	−0.000
	(1.80)	(−0.43)
AGE	−0.010	−0.000
	(−0.92)	(−0.14)
BIG4	−0.001	−0.001
	(−0.30)	(−0.90)
FSIZE	0.001	0.001**
	(1.06)	(2.41)
FAGE	0.000	0.000
	(1.46)	(0.54)
TANG	0.015	−0.001
	(1.62)	(−0.61)
ROE	0.010*	−0.000
	(1.97)	(−0.07)
CASHEQ	−0.005	0.000
	(−0.31)	(0.08)
SCORE	−0.000	−0.000
	(−0.94)	(−0.73)
GDP	0.002	0.002
	(0.12)	(0.46)
_cons	−0.016	−0.038
	(−0.08)	(−0.66)
Industry FE	Yes	Yes
Country FE	Yes	Yes
r2	0.251	0.062
r2_a	0.068	−0.017
N	113	298

Note(s): *t*-statistics are given in parentheses
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Source(s): Authors' own work

our findings offer initial considerations for nomination and remuneration committees. Boards might look beyond traditional experience and prioritize academic rigor as an indicator of the cognitive capacity required to steer innovation. However, we caution that recruiting a CEO with reputable university education is not a "magic bullet"; firms should consider strengthening their internal ESG governance infrastructure to ensure that the CEO's cognitive advantages are effectively absorbed and converted into tangible green innovation. Furthermore, for high-leverage firms, hiring leaders with reputable university education may serve as a deliberate strategy to signal credibility to creditors and investors, thereby reducing financing frictions and ensuring that long-term innovation projects remain viable even under tight financial constraints. To maximize this potential, boards should balance their structure with directors possessing strong operational backgrounds to execute the innovative visions brought by these CEOs.

We acknowledge several limitations in this research. First, the reliance on cross-sectional data limits the ability to establish long-term causal inference as the model fails to account for potential time-variable endogeneity. Second, we acknowledge that educational background is an imperfect proxy for cognitive ability; while it is a standard measure in the literature, it inherently fails to isolate specific psychological micro-foundations, such as professional boldness or risk appetite, that could independently drive innovation outcomes. Future research

should prioritize longitudinal panel data to examine the stability of the "prestige effect" across various conditions. Furthermore, scholars should employ psychometric analysis to determine whether the driver of innovation is true cognitive skill, whereby the CEO innovates through intelligent risk calculation, or professional boldness, whereby the CEO innovates simply due to a higher risk tolerance or superior self-confidence.

Supplementary material

The supplementary material for this article can be found online.

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