

Are Younger CEOs Better for Sustainability? Moderating Roles of Education and Experience in Emerging Markets

Ria Karina^{1*}, Teddy Jurnal², Anderson Anderson³, Erna Wati⁴

Universitas Internasional Batam, Batam, Indonesia^{1,2,3,4}

ria@uib.ac.id^{1*}, teddy@uib.ac.id², 2042127.anderson@uib.edu³, erna.wati@uib.ac.id⁴



Article History

Received on 05 April 2026

1st Revised on 14 April 2026

2nd Revised on 21 April 2026

3rd Revised on 26 May 2026

4th Revised on 16 June 2026

Accepted on 17 June 2026

Abstract

Purpose: This study aims to examine the effect of young Chief Executive Officer (CEO) on sustainability performance and investigate the moderating roles of CEO education and experience.

Methodology: This study employs a quantitative research approach using panel data from companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. The sample consists of 189 companies that published annual and sustainability reports, resulting in 128 firm-year observations that were analyzed using StataMP 17 and panel regression analysis.

Results: The findings show that young CEOs do not directly improve sustainability performance. However, CEO education and international experience strengthen their ability to implement sustainability-oriented strategies.

Conclusions: This study concludes that the effectiveness of young CEOs in enhancing sustainability performance depends on the quality of their managerial human capital, particularly their education and international experience. These findings support the Upper Echelons Theory by demonstrating that executive characteristics shape sustainability-related strategic decisions.

Limitations: This study may face selection bias because it only includes firms that published both annual and sustainability reports during 2019–2023, potentially excluding less-transparent firms. In addition, the use of quantitative methods limits the deeper exploration of qualitative factors such as CEO values, stakeholder pressure, and organizational culture.

Contributions: This study extends Upper Echelons Theory by examining the moderating effects of CEO education and international experience on the relationship between young CEOs and sustainability performance. The findings provide practical insights for firms and policymakers in developing effective sustainability leadership strategies.

Keywords: *CEO Age, CEO Education, CEO Experience, Sustainability Performance, Young CEO*

How to Cite: Karina, R., Jurnal, T., Anderson, & Wati, E. (2026). Are Younger CEOs Better for Sustainability? Moderating Roles of Education and Experience in Emerging Markets. *Studi Akuntansi, Keuangan, dan Manajemen*, 6(1), 143-160.

1. Introduction

Indonesia grapples with significant sustainability challenges, primarily driven by deforestation, pollution, and the loss of biodiversity (Sloan et al., 2019). The rapid expansion of palm oil plantations, logging, and agricultural activities has resulted in one of the highest deforestation rates globally, threatening the country's rich biodiversity and contributing to climate change (Sumarga, Hein, Hooijer, & Vernimmen, 2016). This reflects the Indonesian government's commitment to sustainable development. However, Indonesia's position in the Environmental Performance Index (EPI) has shown a decline over time (Purwantini, Faisal, Januarti, & Dwiatmoko, 2018). In 2022, Indonesia ranked 164th, but by 2024, it had improved to 163rd (Hicham, Soumeia, Fatima, Mohamed, & Amine, 2024; Kussumardianadewi, Latief, & Ilyas, 2024). This indicates that challenges remain in implementing

sustainable practices in Indonesia to support the achievement of the 2030 Agenda for Sustainable Development ([Gunawan & SeTin, 2019](#); [Itan, Laudeciska, Karjantoro, & Chen, 2023](#)).

The implementation of sustainability in a company depends on the characteristics of the Chief Executive Officer (CEO) who leads the corporate strategy ([Bhaskar, Bansal, Abbassi, & Pandey, 2023](#); [Li, Hang, Shah, Akram, & Ozturk, 2020](#); [Ratri, Harymawan, & Kamarudin, 2021](#)). This is because a CEO's experience influences the strategy and perspective in making corporate decisions ([Azam, Boari, & Bertolotti, 2018](#)). Younger CEO increasingly prioritize sustainability as a core aspect of their business strategies ([Waddock & Lozano, 2013](#)). This is because younger CEO tend to care about global trends and follow global developments [Canton \(2019\)](#), thus enabling them to survive in a competitive industry with a dynamic environment ([Deshati, 2023](#)). Recognizing the pressing challenges posed by climate change, resource depletion, and social inequality, they understand that sustainable practices are not only ethically responsible but also crucial for long-term profitability ([Balon, Kottala, & Reddy, 2022](#)).

The differences in opinions within the literature create a research gap in analyzing the influence of younger CEO on sustainability performance. Several studies indicate that the presence of younger CEO does not necessarily lead to improved sustainability performance ([Hussain, Tian, Ashraf, Khan, & Ying, 2023](#); [Sales & Hayashi, 2025](#); [Y. Zhang, Khan, Lee, & Salik, 2019](#)). However, other studies support the idea that young leaders can have a positive impact because of their openness to innovation and environmental awareness ([Fixen, 2020](#); [Loock & Phillips, 2020](#)). To address this research gap, this study investigates the influence of young CEO on sustainability performance. In addition, this study includes CEO experience and education as moderating variables to clarify the relationship between young CEO and sustainability performance by examining the role of CEO's capacity in strengthening the relationship.

The education and experience of a CEO significantly influence their approach to sustainability performance [Shahab et al. \(2019\)](#), especially among younger CEO. Practical experience is crucial. Younger CEO who have previously worked in roles focused on Corporate Social Responsibility (CSR) or sustainability initiatives are likely to be more committed to these values ([Alkayed, Shehadeh, Yousef, & Hussainey, 2024](#)). They understand the operational challenges and opportunities involved in implementing sustainable practices ([Klingenberg & Rothberg, 2020](#)). This combination of education and experience fosters a proactive mindset, encouraging innovation and the adoption of best practices in sustainability, ultimately leading to improved performance and accountability within their organizations ([Zhou, Wang, & Zhao, 2020](#)). As such, young CEO with better education and experience strongly influence the sustainability performance of the organization.

This study offers various contributions to practice and literature. This study provides new empirical evidence and knowledge on how younger CEO influence sustainability performance if they have better education and experience as important factors in this relationship. For organizations, the findings highlight key traits and backgrounds that make younger CEO effective in driving sustainability, providing guidance for leadership development and recruitment. For policymakers, this study supports the creation of governance policies that promote the appointment of young, well-educated, and experienced leaders to improve long-term sustainability results.

2. Literature Review and Hypotheses Development

Sustainability performance management integrates the environmental, social, and economic aspects of corporate management, linking them to business strategy and reporting ([Schaltegger & Wagner, 2006](#)). It reflects an organization's ability to balance financial objectives with broader stakeholder and sustainability concerns through measurable, qualitative, and quantitative indicators ([Leignel, Ménager, & Yablonski, 2019](#)). Previous studies have emphasized that sustainability performance encompasses the three main dimensions of sustainability: economic, environmental, and social performance ([Farchi, Touzi, Farchi, & Mousrij, 2021](#)). Prior research also demonstrates that strong sustainability performance is associated with various organizational benefits, including innovation capability, customer retention, operational efficiency, and employee satisfaction ([Gadenne, Sands, & Mia, 2012](#)). However, achieving

sustainability objectives requires strategic leadership and managerial commitment, making executive characteristics important determinants of sustainability outcomes.

2.1 Young CEO and Sustainability Performance

Although some studies highlight the potential advantages, several findings suggest that CEO Age may have a significant negative impact on company performance. Their limited experience and tendency to prioritize rapid growth can undermine long-term strategic planning and sustainability goals ([Suherman, Mahfirah, Usman, Kurniawati, & Kurnianti, 2023](#)). Research has also shown that firms, particularly state-owned enterprises and large asset-based companies, prefer cognitively mature and experienced CEOs, as they tend to enhance firm value and reinforce CSR initiatives ([Li et al., 2020](#)). Moreover, companies often achieve stronger performance under older CEOs because of their broader industry experience, which instills greater investor confidence in their leadership ([Emestine & Setyaningrum, 2019](#)). While younger CEO may contribute to certain aspects of organizational success, they remain only one factor among many, and their effectiveness is frequently limited by gaps in leadership maturity and strategic alignment ([Aithal, 2023](#); [Belenzon, Shamshur, & Zarutskie, 2019](#)). Based on previous research, the hypothesis developed in this study is as follows:

H₁: Young CEO has a significant negative effect on sustainability performance

2.2 The Moderating Role of CEO Education

Previous empirical studies by [Silvina, Robin, and Yuwono \(2022\)](#) found that CEOs with business and management educational backgrounds improve company performance. CEOs with business and management educational backgrounds can utilize their specialization to make the right decisions to improve company performance ([Jaggia & Thosar, 2021](#)). CEO education is important for corporate decision-making, and the results of these decisions reflect the CEO's competence ([Setiawan & Gestanti, 2022](#)). CEO's higher level of education will make them more motivated to take risky decisions to obtain a higher level of compensation ([J. Zhang, Xue, & Zhang, 2022](#)). CEOs with a master's degree in business receive higher compensation ([Setiawan & Gestanti, 2022](#)). Although CEO education may complement the influence of young CEO on firm performance, it is only one of many factors that contribute to organizational success ([Suherman et al., 2023](#)). A holistic understanding of CEO capabilities, coupled with a consideration of broader organizational dynamics, is necessary to accurately assess their overall impact on company performance ([Wilhelm & Talaulicar, 2019](#)). Building upon prior research, the hypothesis formulated for this study is as follows:

H₂: CEO education moderates the relationship between Young CEO and sustainability performance

2.3 The Moderating Role of CEO Experience

Research over the past five years has consistently shown that CEO experience, particularly in an international context, can significantly impact company performance. [Huong and Vu \(2023\)](#) found that CEOs with overseas experience tend to lead higher-performing companies, and this relationship is further strengthened by CEO tenure. Similarly, [Xu \(2023\)](#) shows that CEOs with more general work experience are more likely to engage in foreign direct investment, which is a key aspect of corporate globalization. However, the impact of young CEO on company performance is mixed. Although [Suherman et al. \(2023\)](#) found that CEO Age can increase or decrease firm performance, [Belenzon et al. \(2019\)](#) argued that older CEOs tend to prioritize organizational survival over higher profits and faster growth. These findings underscore the complex interactions between CEO experience, age, and firm performance, with international references providing valuable insights ([Belenzon et al., 2019](#); [Huong & Vu, 2023](#); [Suherman et al., 2023](#); [Xu, 2023](#)). CEO experience can serve as an important managerial resource that strengthens younger CEOs' capability to implement sustainability-oriented strategies. Drawing from the existing research, the hypothesis constructed for this study is as follows:

H₃: CEO experience moderates the relationship between Young CEO and sustainability performance

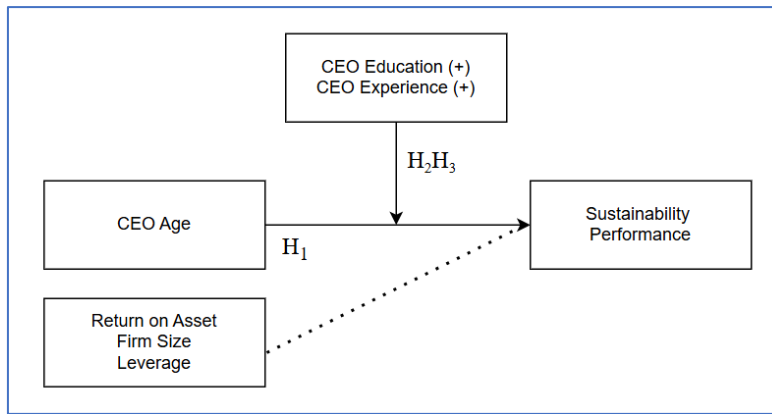


Figure 1. Conceptual framework

Figure 1 illustrates the conceptual framework of the study, which examines the relationship between CEO Age and Sustainability Performance, while considering the moderating effects of CEO Education and CEO Experience. The framework proposes that CEO age has a direct effect on sustainability performance, represented by Hypothesis 1 (H₁). Furthermore, CEO education and CEO experience are expected to strengthen or weaken the relationship between CEO age and sustainability performance, as indicated by Hypotheses 2 and 3 (H₂ and H₃). In addition, several firm-level control variables, including Return on Assets (ROA), firm size, and leverage, are included to account for other factors that may influence sustainability performance. Overall, the model demonstrates that both individual CEO characteristics and organizational factors contribute to variations in corporate sustainability outcomes.

3. Methodology

This research used quantitative research methods using concrete figures based on the data collected and analyzed (Stockemer, Stockemer, & Glaeser, 2019). The research sample used in this study are companies in Indonesia that have GRI standards on corporate social responsibility reports and publish corporate social responsibility reports on the firm's official website, as well as companies in Indonesia that publish corporate annual reports on the Indonesia Stock Exchange (IDX) or the firm's official website (Wiralestari, 2022). This study used StataMP 17 for data testing. The results of the data test were descriptive statistics, Pearson correlation, and regression. The method used in this research was purposive sampling and sample selection based on certain criteria (Conlon, Timonen, Elliott-O'Dare, O'Keeffe, & Foley, 2020).

The sample selection criteria in this study were determined based on several requirements to ensure the availability and relevance of the data. First, the study included companies that published annual reports on the Indonesia Stock Exchange (IDX) or their official websites during the 2019–2023 period. Second, the selected companies were required to publish sustainability reports on their official websites within the same period. Third, companies were included only if they provided complete data necessary for measuring all research variables. Finally, companies led by CEOs aged above 50 years were excluded because this study specifically focuses on examining the influence of young CEOs on sustainability performance. Therefore, the final sample consisted of companies led by young CEOs to provide a more specific analysis of how younger executive leadership characteristics affect corporate sustainability outcomes. The maximum age for a young CEO is 50 years old (Emestine & Setyaningrum, 2019; Navaretti, Castellani, & Pieri, 2022). The total sample observed in this study is described as Table 1.

Table 1. Number of samples used in this study

Description	Number
Number of Companies on the IDX	938
Number of Companies Observed	189
5 Years Data	945
Data that don't match criteria	817
Total Data Observed	128

This study used sustainability performance as the dependent variable and Young CEO as the independent variable. The moderating variables used are CEO Experience and CEO Education. The control variables used are Return on Assets, Firm Size, and Leverage.

3.1 Dependent Variable Measurement

The dependent variable in this study is the sustainability performance. Sustainability performance can be measured using the Global Reporting Initiative (GRI) G4 guidelines, accessed from the GRI official website, specifically www.globalreporting.org, which offers a comprehensive framework for reporting environmental, social, and economic impacts ([Tjahjadi, Soewarno, & Mustikaningtiyas, 2021](#)). The GRI-G4 guidelines focus on transparency, accountability, and stakeholder engagement, providing organizations with detailed indicators to measure and disclose their sustainability efforts ([Miati, Ariyanto, Widanaputra, & Putri, 2026](#)). These guidelines cover a wide range of topics, such as energy usage, water management, emissions, human rights, labor practices, and supply chain sustainability ([Silva, Ferreira, & Georges, 2019](#)). Sustainability performance was measured using content analysis of annual and sustainability reports. By following the GRI-G4 standards, companies can create sustainability reports that provide clear, standardized information, enabling stakeholders including investors, customers, and employees to assess the organization's commitment to sustainable development ([Kumar, Raj, & Singh, 2023](#)).

3.2 Independent Variable Measurement

The independent variable in this study is the Young CEO. Young CEO can be measured using the age of the CEO. This variable can be measured by taking the data in the firm's annual report where the age of the CEO is typically disclosed alongside other executive information ([Soepriyanto, Erma Zudana, & Meiryani, 2024](#)). In this research, younger CEOs defined as those under the age of 50 years are the focus of analysis ([Emestine & Setyaningrum, 2019](#); [Navaretti et al., 2022](#)). The cutoff of 50 years was used to classify younger CEOs because executives below this age are generally associated with greater innovation orientation, flexibility, and openness to sustainability-related strategies than older executives, consistent with the prior Upper Echelons Theory literature. By tracking these data, analysts can assess how the CEO's age might influence their leadership style, decision-making, and approach to risk ([Arif, 2023](#)). Younger CEOs may be perceived as more innovative and open to new technologies, whereas older CEOs may bring more experience and stability to the organization ([Shahab et al., 2019](#)). Additionally, a Young CEO can offer insights into succession planning, as age may signal the potential for leadership transitions in the near future ([Tjahjadi et al., 2021](#)).

3.3 Moderating Variabel Measurement

The moderating variables in this study are CEO Education and CEO Experience. CEO education was measured based on the educational background of the CEO obtained from annual reports and company profiles ([Adlina & Junaidda, 2025](#)). The variable was coded using a dummy measurement, where a value of 1 indicates that the CEO possesses international educational experience, and 0 otherwise. CEO education is typically assessed by examining the level, field of study, and institution attended, with a particular focus on whether the CEO holds national or international qualifications ([Siew-Boey & Hooy, 2021](#)). National education often reflects a CEO's understanding of local business practices, regulations, and cultural nuances, whereas international education may indicate a broader perspective, global networks, and the ability to navigate multinational challenges ([Tjahjadi et al., 2021](#)). Analyzing these educational aspects helps stakeholders evaluate how a CEO's academic experiences might influence their strategic direction and the company's overall performance ([Ahmad, Prasetyo, Buchdadi, Widyastuti, & Kurniawati, 2022](#)).

In contrast, measuring a CEO's experience involves evaluating their professional background, including the depth and breadth of their leadership roles both domestically and internationally ([Flammer, 2013](#)). A value of 1 was assigned if the CEO had international working experience, overseas managerial exposure, or professional experience in foreign institutions or multinational companies, and 0, otherwise. A CEO's national experience typically reflects their expertise in navigating local market dynamics, understanding regional regulations, and managing operations within a specific country ([Nguyen & Ha, 2024](#)). In contrast, international experience is valuable for CEOs who lead global

organizations or manage cross-border operations because it demonstrates their ability to operate in diverse markets, understand different cultural nuances, and build global strategies ([Fionita et al., 2022](#)). The combination of national and international experience can be a key factor in a CEO's ability to adapt to changing market conditions, drive business growth, and lead in a globalized economy ([Al-Zuhairi, 2024](#)).

3.4 Control Variable Measurement

The control variables used in this study are Return on Assets (ROA), firm size, and leverage. In studies examining the relationship between CEO characteristics and sustainability performance, ROA can influence the results ([Ramadanti, Mulyasari, & Astuti, 2023](#)). By including it as a control variable, researchers can isolate the effect of financial factors from leadership-related ones ([Keller, Glaum, Bausch, & Bunz, 2023](#)). It is calculated by dividing a company's net income by its total assets, and the result is typically expressed as a percentage ([Al-Zuhairi, 2024](#)). A higher ROA indicates that a company efficiently converts its assets into profits, whereas a lower ROA suggests potential inefficiencies or underutilization of assets ([Fachrian & Hidayat, 2023](#)). This ratio is particularly useful for comparing companies within the same industry, as it highlights those that are better at generating profits from their available resources ([Devi, Sudiartha, & Karma, 2022](#)).

Firm size is an important metric that reflects a company's scale and financial strength ([García & Herrero, 2022](#)). Firm size is often considered an indicator of organizational capacity, which can influence how policies or strategic decisions are implemented, including those related to social and environmental responsibilities ([Juwita & Jurnal, 2020](#)). It can be measured in various ways, depending on the context, but the most common indicators include revenue, total assets, and market capitalization ([Hariyanto, 2021](#)). Revenue measures the total sales or income generated by a company over a specific period and is often used as a proxy for its overall business volume ([Petchsakulwong & Jansakul, 2018](#)). Total assets represent the value of everything a company owns, from cash and inventory to property and equipment, and are typically used to assess a firm's operational scale ([Bhat, Chen, Jebran, & Bhutto, 2018](#)).

Market capitalization, on the other hand, is calculated by multiplying a company's stock price by the number of outstanding shares, providing an estimate of its total market value ([Hariyanto, 2021](#)). These measures help determine the size of a company in terms of its economic footprint and financial capacity ([Petchsakulwong & Jansakul, 2018](#)). Leverage is a financial metric used to assess the degree to which a company relies on debt to finance its operations and growth ([Ishak, 2024](#)). By including leverage as a control variable, the influence of a firm's financial condition on sustainability performance can be isolated, allowing the effect of CEO characteristics to be observed more accurately ([Soysa, Pallegedara, Sisira Kumara, Jayasena, & Samaranayake, 2022](#)). It is commonly measured using ratios such as the debt-to-equity ratio, debt ratio, and interest coverage ratio ([Fatouh, Giansante, & Ongena, 2024](#)). The debt-to-equity ratio compares a company's total debt to its shareholders' equity, providing insight into the balance between debt and equity financing ([Fatouh et al., 2024](#)). A higher debt-to-equity ratio suggests that a company is more leveraged, meaning that it relies more on borrowed money than on equity to fund its activities ([Nguyen & Ha, 2024](#)). The debt ratio, calculated by dividing total debt by total assets, shows the proportion of a company's assets that are financed by debt ([Fatouh et al., 2024](#)). Interest coverage, which measures a company's ability to meet its interest obligations from earnings, is another key indicator of leverage, highlighting the risk of financial strain when leverage is high ([Jaskiewicz, Block, Combs, & Miller, 2017](#)).

3.5 Formula

The formula used in this study is as follows:

$$SP_{i,t} = \alpha_i + \beta_1 \times AGE_{i,t} + \beta_2 \times ROA_{i,t} + \beta_3 \times FSI_{i,t} + \beta_4 \times LEV_{i,t} + \epsilon_{i,t} \quad (1)$$

$$SP_{i,t} = \alpha_i + \beta_1 \times AGE_{i,t} + \beta_2 \times EXP_{i,t} + \beta_3 \times AGE * EXP_{i,t} + \beta_4 \times ROA_{i,t} + \beta_5 \times FSI_{i,t} + \beta_6 \times LEV_{i,t} + \epsilon_{i,t} \quad (2)$$

$$SP_{i,t} = \alpha_i + \beta_1 \times AGE_{i,t} + \beta_2 \times EDU_{i,t} + \beta_3 \times AGE * EDU_{i,t} + \beta_4 \times ROA_{i,t} + \beta_5 \times FSI_{i,t} + \beta_6 \times LEV_{i,t} + \epsilon_{i,t} \quad (3)$$

Where:

- $SP_{i,t}$ is the sustainability performance of firm i in period t ;
- α_i is a constant term.
- $AGE_{i,t}$ is the age of the Young CEO of firm i in period t ;
- $EXP_{i,t}$ is the CEO experience of firm i in period t ;
- $EDU_{i,t}$ is the CEO education of firm i in period t ;
- $ROA_{i,t}$ is Return on asset of firm i in period t ; and
- $FS_{i,t}$ is Firm size of firm i in period t ; and
- $LEV_{i,t}$ is Leverage of firm i in period t ; and
- $\varepsilon_{i,t}$ is the error term of the model.

4. Results and Discussions

4.1 Descriptive Statistic Analysis

Table 2. Descriptive statistical analysis result

	Mean	Median	Minimum	Maximum
SP	0.580	0.595	0.000	0.944
AGE	46.070	47.000	35.000	50.000
ROA	0.047	0.020	-0.354	0.416
FS	30.010	30.173	22.159	33.269
LEV	0.525	0.561	0.000	1.060

Table 2 shows, sustainability performance was measured on a scale from 0 to 1, where 0 represents the lowest possible sustainability performance and 1 represents the highest. The average sustainability performance score is 0.580, suggesting that, on average, the companies in the dataset have a moderate sustainability performance ([Rajesh, 2020](#)). The median sustainability performance score is 0.595, meaning that half of the companies in the dataset have scores below this value and the other half have scores above it ([Hönel, Ericsson, Löwe, & Wingkvist, 2023](#)). The minimum sustainability performance score is 0.000 and the maximum sustainability performance score is 0.944, indicating that one or more companies in the dataset have very high sustainability performance ([Rajesh, 2020](#)).

The mean age of Young CEO is 46.070 years, indicating that the CEOs in the dataset are in their mid-40s. The mean provides a general idea of the typical age of CEOs in the sampled companies. The median age for Young CEO is 47.000 years, meaning that half of the CEOs are younger than 47 years and half are older. The median is a useful measure because it is not affected by extreme values or outliers ([Chakrabarty, 2021](#)). For the control variables, the mean ROA is 0.047, or 4.7%, suggesting a moderate level of efficiency in asset utilization, although what is considered "good" can vary by industry ([Dwaikat, Qubbaj, & Queiri, 2023](#)). The median ROA is 0.020, or 2.0%, suggesting that a few companies with very high ROA values are pulling the average upward ([Mira, 2020](#)).

The mean firm size is 30.010, indicating that, on average, companies in this dataset have a firm size of approximately 30 units. This average value provides a general sense of the typical scale of the companies included in the sample ([Vokoun, 2017](#)). The median firm size is 30.173, which is close to the mean. The small difference between the mean and median suggests that the firm size data are approximately symmetrically distributed, with no significant skew caused by extremely large or small firms ([Vajapeyam et al., 2022](#)). The mean leverage ratio is 0.525, indicating that, on average, companies in the dataset finance approximately 52.5% of their operations through debt. This level of leverage suggests a moderate-to-high reliance on debt financing, which can have both advantages and risks ([Berg & Heider, 2024](#)). The median leverage ratio is 0.561, which means that half of the companies in the sample have a leverage ratio higher than 0.561. Since the median (0.561) is slightly higher than the mean (0.525), it suggests a slight left skew in the data, where a few companies have particularly low leverage ratios that pull the average down ([Ferrão, Curto, & Gama, 2016](#)).

Table 3. Descriptive frequency analysis result

		Frequency	Percentage (%)
CEO Foreign Education (EDU)	0: If a CEO hasn't a foreign education	31	24.22
	1: If a CEO has a foreign education	97	75.78
CEO Foreign Education (EDU)	0: If a CEO hasn't a foreign experience	77	60.16
	1: If a CEO has a foreign experience	51	39.84

Table 3 shows, CEO education was coded on a binary scale (0 or 1) ([Kallias, Kallias, Tsalkamas, & Zhang, 2023](#)). Table 3 shows that 75.78% of the CEOs have a foreign educational background, while 24.22% have no foreign educational background. The mean value for CEO education is 0.758, indicating that, on average, approximately 76% of the CEOs in the sample have completed higher education. This highlights the importance of formal education among corporate leaders and may reflect a preference for educational qualifications in CEO selection ([Gounopoulos, Loukopoulos, & Loukopoulos, 2021](#)). This further supports the idea that higher education is a common and possibly expected qualification for individuals in top-level executive roles. Meanwhile, CEO experience is also represented on a binary scale (0 or 1) ([Lashitew, 2023](#)). Based on the data above, most CEOs (60.16%) do not have foreign experience, and only 39.84% have foreign experience. This suggests that less than half of the CEOs have international exposure, which could be important for companies operating in global markets ([Schmid & Baldermann, 2021](#)).

4.2 Pearson Correlation Analysis

Table 4. Pearson correlation analysis result

	SP	AGE	ROA	FS	LEV
SP	1.000				
AGE	0.062 (0.484)	1.000			
ROA	-0.013 (0.887)	-0.077 (0.385)	1.000		
FS	-0.164* (0.064)	-0.005 (0.956)	-0.083 (0.349)	1.000	
LEV	-0.186** (0.036)	0.305*** (0.000)	-0.130 (0.145)	0.204** (0.021)	1.000

Based on the results of Table 4, correlations among the five variables studied can be observed. It can be concluded that the two variables with the highest correlation are Leverage with Young CEO (correlation = 0.305) and Leverage with Firm Size (correlation = 0.204). The lowest correlations are between Firm Size and Sustainability Performance (correlation = -0.164) and Leverage and Sustainability Performance (correlation = -0.186).

The findings show that as the age of the CEO increases, they tend to take lower financial risks ([Chowdhury & Fink, 2017](#)). More experienced CEOs may be more cautious in using debt, which can affect a company's stability ([Anh & An, 2023](#)). Additionally, older CEOs often have more experience in crisis management; therefore, they prefer more conservative strategies ([Ferri, Lagravinese, & Resce, 2021](#)). The correlation between leverage and firm size typically indicates that larger companies tend to have higher leverage because larger firms usually have more stable revenues, which makes creditors more confident in providing loans ([Chatterjee & Eyigungor, 2023](#)).

The lowest correlation between firm size and sustainability performance suggests that company size is not always a good indicator of sustainability success ([Ho, Wang, Ho-Dac, & Vitell, 2019](#)). Larger companies with complex structures may find it more difficult to effectively implement sustainability policies, meaning their sustainability performance may not be proportionate to their size ([Sevil, Cruz, Reyes, & Vassolo, 2022](#)). Companies with high debt levels are often more focused on financial obligations and short-term profitability rather than investing in sustainability initiatives, which often require substantial upfront investments ([Pereira, Monteiro, Silva, & Lima, 2023](#)).

4.3 Main Regression Analysis

Table 5. Regression test result

	(1)	(2)	(3)	(4)	(5)	(6)
	SP	SP	SP	SP	SP	SP
AGE	0.011**	0.012**	0.046***	0.011**	0.010**	0.016***
	(2.21)	(2.40)	(3.07)	(2.21)	(2.17)	(2.82)
ROA	-0.087	-0.089	-0.105	-0.087	-0.125	-0.074
	(-0.34)	(-0.33)	(-0.40)	(-0.34)	(-0.48)	(-0.28)
FS	-0.016*	-0.018**	-0.020**	-0.016*	-0.017**	-0.018**
	(-1.80)	(-2.05)	(-2.41)	(-1.80)	(-2.04)	(-2.08)
LEV	-0.176**	-0.163*	-0.158*	-0.176**	-0.170*	-0.172*
	(-2.00)	(-1.87)	(-1.85)	(-2.00)	(-1.92)	(-1.93)
EDU		0.068	1.899***			
		(1.27)	(2.64)			
AGExEDU			-0.039**			
			(-2.55)			
EXP					0.034	0.881**
					(0.84)	(1.99)
AGExEXP						-0.018*
						(-1.92)
cons	0.572	0.514	-1.031	0.572	0.608	0.380
	(1.47)	(1.33)	(-1.35)	(1.47)	(1.62)	(1.00)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: *t* statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5 shows the regression results of this study show that young CEOs have a positive and significant effect on sustainability performance (coefficient = 0.011, $p < 0.05$). These findings indicate that older CEOs tend to increase the company's sustainability performance disclosure, which means that H_1 is not supported. However, when the relationship is moderated by CEO education and experience, the effect weakens. The moderation effect of CEO education shows a negative coefficient of -0.039 ($p < 0.05$), while CEO experience shows a coefficient of -0.018 ($p < 0.1$). These findings indicate that both CEO education and CEO experience significantly weaken the influence of older CEOs on sustainability performance; therefore, H_2 and H_3 are accepted.

4.4 Further Discussion

4.4.1 Younger CEO Increasing the Impact on Sustainability Performance

The results of this study indicate that younger CEOs positively affect sustainability performance. This finding contradicts the initial hypothesis (H_1), which predicted a negative relationship based on the assumption that younger CEOs may lack the experience, stakeholder management capabilities, and long-term strategic orientation necessary for effective sustainability implementation in the hotel industry. From the legitimacy theory perspective, younger CEOs are expected to face difficulties in responding to complex societal expectations, potentially weakening organizational legitimacy. Similarly, stakeholder theory suggests that limited managerial experience may constrain younger CEOs' ability to balance the interests of diverse stakeholder groups and address sustainability-related demands effectively. Thus, the presence of a younger CEO in an organization is not always associated with improved sustainable performance.

Contrary to the belief that younger CEO are more innovative and environmentally conscious, some studies suggest that a lack of experience and short-term focus may hinder effective sustainability strategies (Hussain et al., 2023). Sales and Hayashi (2025); Y. Zhang et al. (2019) highlight that younger CEO may be open to innovation, they often prioritize rapid growth or market disruption over long-term environmental or social goals. Similarly, Shah and Guild (2022) argue that without a deep understanding of complex sustainability frameworks, younger CEO may adopt surface-level practices

rather than meaningful systemic change. Moreover, [Drago and Fortuna \(2023\)](#) caution that viewing sustainability as a strategic opportunity requires mature leadership capable of balancing financial performance with ethical responsibilities, which shows something that may be lacking in younger executives. [Böttcher, Empelmann, Weking, Hein, and Krcmar \(2024\)](#) emphasize that while adopting green technologies is important, effective implementation demands seasoned leadership, strategic patience, and broad stakeholder alignment, which younger CEOs may not possess.

However, empirical findings suggest that these assumptions may not fully reflect the characteristics of contemporary younger CEOs. One possible explanation is that younger leaders are more responsive to emerging social and environmental issues and are more likely to perceive sustainability as a strategic rather than compliance-oriented activity. Compared with older executives, younger CEOs may be more familiar with sustainability-related challenges, technological innovations, and evolving stakeholder expectations, which enables them to integrate sustainability objectives into corporate decision-making more effectively. [Vuorio \(2017\)](#) shows that younger CEO tend to be more attuned to the values and expectations of younger generations, who place a high priority on sustainability. This generational shift is influencing corporate strategies, with younger leaders aligning business practices with Environmental, Social, and Governance (ESG) criteria to appeal to consumers, investors, and employees who demand responsible business practices ([Fixen, 2020](#)). By focusing on sustainability, younger CEO can improve their company's reputation, enhance stakeholder engagement, and ultimately contribute to better sustainability performance ([Loock & Phillips, 2020](#)). This finding suggests that organizations should consider younger leaders at the top management level to drive companies towards more sustainable and socially responsible practices.

4.4.2 CEO Education Strengthen the Relation between Young CEO and Sustainability Performance

The findings show that CEO education can strengthen the relationship between younger CEO and sustainability performance. Relevant formal education can be a crucial factor that strengthens the positive relationship between young CEOs and corporate sustainability performance. From the perspective of legitimacy theory, education provides an intellectual foundation that allows young CEOs to understand the importance of aligning business practices with social norms and societal expectations regarding sustainability, thereby increasing an organization's legitimacy in the eyes of the public. From the perspective of stakeholder theory, strong education also equips young CEOs with the knowledge and skills to identify, understand, and respond to the needs of stakeholders.

According to [Ghardallou \(2022\)](#), a CEO's educational background can strengthen the relationship between young CEOs and corporate sustainability performance because education shapes their knowledge, skills, and mindset regarding sustainability issues. As explained by [Gounopoulos et al. \(2021\)](#), young CEOs with advanced degrees in fields such as environmental science, business sustainability, or engineering tend to be better equipped to understand and implement practices that support sustainable goals. [Shahab et al. \(2019\)](#) confirms relevant formal education can also encourage them to be more proactive in adopting cutting-edge technologies, renewable energy solutions and efficient resource management, all of which contribute to improved sustainability performance.

In addition, [Gresham et al. \(2021\)](#) revealed a new paradigm in sustainability education: academic training can encourage a more analytical and data-driven approach to monitoring environmental impacts and ensuring sustainable outcomes. Moreover, the educational experiences of a CEO can influence their broader worldview and commitment to social and environmental responsibility ([Cha, Abebe, & Dadanlar, 2019](#)). Younger CEO who have been educated in today's globalized, sustainability-conscious environment are more likely to view sustainable practices as essential to long-term business success ([Miller & Xu, 2020](#)). They may prioritize sustainability as a core value in the company's culture and operations. This enhanced focus on sustainability, backed by solid academic knowledge, can further solidify the connection between young leadership and improved sustainability performance ([Okreglicka, 2023](#)). Consequently, CEO education not only amplifies the impact of young leadership on sustainability but also enables these leaders to make informed and strategic decisions that drive sustainable business practices ([Ghardallou, 2022](#)).

This study shows that education strengthens the positive impact of young CEO on sustainability performance. It advances the theoretical understanding of how formal education, especially in relevant fields such as environmental science, engineering, or sustainability-focused business, can equip young leaders with the knowledge, values, and strategic capabilities needed to implement effective sustainability initiatives ([Yang, Wang, & Yasmin, 2021](#)). By integrating both supportive and critical perspectives on educational influence, this study offers a more comprehensive view of how academic training can shape leadership behavior, highlighting education as a key enabler that helps younger CEO overcome experience-related limitations in driving sustainable outcomes ([Loureiro, Dieguez, & Ferreira, 2022](#)). This has important implications for executive recruitment, leadership development and sustainability policies within organizations.

4.4.3 CEO Experience Strengthen the Relation between Young CEO and Sustainability Performance

The findings also show that CEO experience can strengthen the relationship between younger CEO and sustainability performance. The experience of young CEO is an important element that can strengthen the legitimacy of the company in facing social pressure and increasing public expectations on sustainability issues. Within the framework of legitimacy theory, experience provides additional credibility for young CEO to show that they can manage the company responsibly and in line with prevailing social values. From a stakeholder theory perspective, experience also allows young CEO to understand and respond to the needs of various stakeholders more effectively and build trust through consistent actions based on sustainability values. As stated by [Ji, Su, Zhang, and Wang \(2023\)](#), young CEO with experience in sectors that emphasize sustainability will be better equipped to develop effective strategies to achieve environmental and social goals. [Huang and Wei \(2023\)](#) also assert that first-hand experience in dealing with sustainability challenges makes young leaders more sensitive to the practical implications of sustainability policies. With this understanding, they can make more informed decisions, drive green innovation, and accelerate the adoption of environmentally friendly practices, ultimately improving corporate sustainability performance ([Nogueira, Gomes, & Lopes, 2023](#); [Rios et al., 2018](#)).

Furthermore, a CEO's experience in leadership roles can enhance their ability to engage and inspire employees, stakeholders, and partners in sustainability efforts ([Rahima & Shah, 2020](#)). Young CEO with a track record of successfully managing teams and driving organizational change are more likely to create a culture of sustainability within their companies ([Streimikiene, Mikalauskiene, Digriene, & Kyriakopoulos, 2021](#)). Their leadership experience also helps them effectively communicate the importance of sustainability, set clear objectives, and align the entire organization with common environmental and social goals ([Fry & Egel, 2021](#)). Consequently, their experience not only enhances their ability to lead sustainability initiatives but also strengthens the impact of young leadership on overall sustainability performance, fostering long-term success and positive environmental outcomes ([Trinh, Salama, Li, Lyu, & Papagiannidis, 2023](#)). This study shows that CEO experience strengthens the positive effect of young CEO on sustainability performance. While youth may bring innovation and adaptability, limited managerial experience can hinder effective execution of long-term sustainability strategies ([Shukree, Arshad, Ismail, & Alias, 2023](#)). By demonstrating that prior experience helps younger CEO make more informed, strategic, and balanced decisions, this study adds depth to upper echelons theory ([Ji et al., 2023](#)). This study also provides practical insights for boards and policymakers, suggesting that combining youthful leadership with relevant experience can produce more effective sustainability results. Furthermore, the findings highlight the importance of mentorship, succession planning, and targeted leadership development programs in shaping future leaders who are dynamic and capable of addressing complex sustainability challenges.

5. Conclusions

5.1 Conclusion

This study examines the impact of young CEOs on corporate sustainability performance and the mediating role of CEO education and experience. Empirical findings suggest that young CEOs do not directly improve sustainability performance and may even show weaker results when considered in isolation. However, the results indicate that the CEO's education and experience significantly modify

this relationship. In particular, young CEOs with stronger educational backgrounds and more extensive professional experience are better positioned to improve corporate sustainability.

These findings support senior leadership theory, which posits that managerial characteristics shape an organization's strategic outcomes. This study extends the existing literature by demonstrating that the effectiveness of young CEOs in promoting sustainability depends not only on their age but also on the quality of their human capital. Therefore, education and experience are critical complementary factors that strengthen young CEOs' ability to implement sustainability-oriented strategies. In practical terms, this study offers recommendations for companies, their boards of directors, and policymakers when designing leadership-recruitment and-development strategies. Companies should not only focus on appointing young leaders but also consider the educational qualifications and professional experience necessary to support effective sustainability management.

5.2 Research Limitations

This study has some limitations. By focusing only on firms that published both annual and sustainability reports from 2019 to 2023, the study may be subject to selection bias as it excludes less transparent or less sustainability-oriented firms. This study is also limited by the quantitative approach used, which may be insufficient to capture the qualitative context or cultural nuances in CEO decision-making related to sustainability. Factors such as personal values, stakeholder pressure, and corporate culture are not reflected in numerical data, even though they may significantly influence sustainability performance.

5.3 Suggestions and Directions for Future Research

To address this limitation, future research could incorporate firms without formal sustainability disclosures using alternative data sources, such as third-party ESG ratings or environmental incident records, to provide a more representative view. In addition, future research could consider qualitative or mixed-method approaches to explore these dynamics more deeply.

Acknowledgement

The authors would like to thank Universitas Internasional Batam for providing facilitation and funding support throughout the research process.

Author Contributions

KR contributed to conceptualization, methodology, and writing the original draft. TJ was responsible for data collection, investigation, and writing review and editing. AA contributed to data analysis, validation, and visualization. EW contributed to supervision, project administration, and writing review and editing.

References

- Adlina, F. S., & Junaidda, U. (2025). Company and CEO Characteristics of climate change disclosure in Malaysia: A proposed empirical framework. *International Journal of Financial, Accounting, and Management*, 7(2), 275-288. doi:<https://doi.org/10.35912/ijfam.v7i2.3117>
- Ahmad, G. N., Prasetyo, M. R. P., Buchdadi, A. D., Widyastuti, U., & Kurniawati, H. (2022). The effect of CEO characteristics on firm performance of food and beverage companies in Indonesia, Malaysia and Singapore. *Quality - Access to Success*, 23(186), 111-122. doi:<https://doi.org/10.47750/QAS/23.186.15>
- Aithal, P. (2023). Anticipated attributes of chief executive officers based on Newly Developed CEO Matrix. *International Journal of Applied Engineering and Management Letters (IJAEML)*, 7(4), 216-248. doi:<https://doi.org/10.47992/ijaeml.2581.7000.0200>
- Al-Zuhairi, A. K. H. (2024). Analysis of underwriting activity and its impact on the profitability ratios of the insurance companies listed in the Iraq stock exchange. *Studia Universitatis Vasile Goldiș, Arad-Seria Științe Economice*, 34(2), 1-31. doi:<https://doi.org/10.2478/sues-2024-0006>

- Alkayed, H., Shehadeh, E., Yousef, I., & Hussainey, K. (2024). Does a female director in the boardroom affect sustainability reporting in the U.S. Healthcare Industry?. *Journal of Risk and Financial Management*, 17(2), 1-21. doi:<https://doi.org/10.3390/jrfm17020049>
- Anh, V. T. T., & An, T. T. H. (2023). CEO experience and adjustment speed toward target leverage: the case of Vietnam. *Journal of Science and Technology Issue on Information and Communications Technology*, 21(6), 83-87. doi:<https://doi.org/10.31130/ud-jst.2023.071e>
- Arif, K. (2023). Do powerful CEOs benefit firm performance in Pakistan?. *Asian Journal of Business and Accounting*, 16(2), 75-106. doi:<https://doi.org/10.22452/ajba.vol16no2.3>
- Azam, A., Boari, C., & Bertolotti, F. (2018). Top management team international experience and strategic decision-making. *Multinational Business Review*, 26(1), 50-70. doi:<https://doi.org/10.1108/MBR-07-2017-0044>
- Balon, V., Kottala, S. Y., & Reddy, K. (2022). Mandatory corporate social responsibility and firm performance in emerging economies: An institution-based view. *Sustainable Technology and Entrepreneurship*, 1(3), 1-9. doi:<https://doi.org/10.1016/j.stae.2022.100023>
- Belenzon, S., Shamshur, A., & Zarutskie, R. (2019). CEO's Age and the Performance of closely held firms. *Strategic Management Journal*, 40(6), 917-944. doi:<https://doi.org/10.1002/smj.3003>
- Berg, T., & Heider, F. (2024). Leverage and risk-taking in a dynamic model. *SSRN Electronic Journal*, 1-52. doi:<https://dx.doi.org/10.2139/ssrn.4883155>
- Bhaskar, R., Bansal, S., Abbassi, W., & Pandey, D. K. (2023). CEO compensation and CSR: Economic implications and policy recommendations. *Economic Analysis and Policy*, 79, 232-256. doi:<https://doi.org/10.1016/j.eap.2023.06.016>
- Bhat, K. U., Chen, Y., Jebran, K., & Bhutto, N. A. (2018). Corporate governance and firm value: A comparative analysis of state and non-state owned companies in the context of Pakistan. *Corporate Governance: The International Journal of Business in Society*, 18(6), 1196-1206. doi:<https://doi.org/10.1108/cg-09-2017-0208>
- Böttcher, T. P., Empelmann, S., Weking, J., Hein, A., & Krcmar, H. (2024). Digital sustainable business models: Using digital technology to integrate ecological sustainability into the core of business models. *Information Systems Journal*, 34(3), 736-761. doi:<https://doi.org/10.1111/isj.12436>
- Canton, J. (2019). Why every CEO needs to be future smart: From AI to sustainability. *Rethinking Strategic Management: Sustainable Strategizing for Positive Impact*, 377-394. doi:https://doi.org/10.1007/978-3-030-06014-5_18
- Cha, W., Abebe, M., & Dadanlar, H. (2019). The effect of CEO Civic engagement on corporate social and environmental performance. *Social Responsibility Journal*, 15(8), 1054-1070. doi:<https://doi.org/10.1108/SRJ-05-2018-0122>
- Chakrabarty, D. (2021). Model describing central tendency of data. *International Journal of Advanced Research in Science, Engineering and Technology*, 8(9), 328-2350.
- Chatterjee, S., & Eyigungor, B. (2023). The firm size-leverage relationship and its implications for entry and business concentration. *Review of Economic Dynamics*, 48, 132-157. doi:<https://doi.org/10.1016/j.red.2022.04.002>
- Chowdhury, J., & Fink, J. (2017). How does CEO age affect firm risk?. *Asia-Pacific Journal of Financial Studies*, 46(3), 381-412. doi:<https://doi.org/10.1111/ajfs.12174>
- Conlon, C., Timonen, V., Elliott-O'Dare, C., O'Keeffe, S., & Foley, G. (2020). Confused about theoretical sampling? engaging theoretical sampling in diverse grounded theory studies. *Qualitative Health Research*, 30(6), 947-959. doi:<https://doi.org/10.1177/1049732319899139>
- Deshati, E. (2023). Staying ahead of the curve: An analysis of strategic agility and its role in ensuring firm survival in a dynamic business environment. *European Scientific Journal*, 19(13), 28-48. doi:<https://doi.org/10.19044/esj.2023.v19n13p28>
- Devi, D. A. M. S., Sudiarta, I. K., & Karma, I. G. M. (2022). Activity ratio and profitability ratio analysis to know causes of decreasing profit: Case Study at the Village Credit Institution of the Suwat Village. *Journal of Applied Sciences in Accounting, Finance, and Tax*, 5(2), 112-120. doi:<https://doi.org/10.31940/jasafint.v5i2.112-120>
- Drago, C., & Fortuna, F. (2023). Investigating the corporate governance and sustainability relationship: A bibliometric analysis using keyword-ensemble community detection. *SSRN Electronic Journal*, 1-42. doi:<https://doi.org/10.2139/ssrn.4495032>

- Dwaikat, N., Qubbaj, I. S., & Queiri, A. (2023). Mediation effects of financial performance between assets utilization and the market value of Palestinian Listed Firms. *Global Business & Finance Review (GBFR)*, 28(5), 99-108. doi:<https://doi.org/10.17549/gbfr.2023.28.5.99>
- Emestine, I. E., & Setyaningrum, D. (2019). CEO characteristics and firm performance; Empirical studies from ASEAN Countries. *Proceedings of the 2018 International Conference on Islamic Economics and Business (ICONIES 2018)*, 101, 423-427. doi:<https://doi.org/10.2991/iconies-18.2019.81>
- Fachrian, Z., & Hidayat, W. W. (2023). The influence of liquidity Ratio as Current (CR), (DER) ratio leverage and asset structure to return on investment of Coal Companies. *International Journal of Accounting and Management Information Systems*, 1(1), 17-31. doi:<https://doi.org/10.35912/ijamis.v1i1.1441>
- Farchi, C., Touzi, B., Farchi, F., & Mousrij, A. (2021). Sustainable performance assessment: A Systematic literature review. *Journal of Sustainable Development of Transport and Logistics*, 6(2), 124-142. doi:<https://doi.org/10.14254/jsdtl.2021.6-2.8>
- Fatouh, M., Giansante, S., & Ongena, S. (2024). Leverage ratio, risk-based capital requirements, and risk-taking in the United Kingdom. *Financial Markets, Institutions & Instruments*, 33(1), 31-60. doi:<https://doi.org/10.1111/fmii.12185>
- Ferrão, J., Curto, J. D., & Gama, A. P. (2016). Low-leverage policy dynamics: An empirical analysis. *Review of Accounting and Finance*, 15(4), 463-483. doi:<https://doi.org/10.1108/RAF-09-2015-0135>
- Ferri, G., Lagravinese, R., & Resce, G. (2021). Did the COVID-19 shock impair the stock performance of companies with older CEOs?. 1-21. doi:<https://doi.org/10.2139/ssrn.3861455>
- Fionita, I., Lestari, N. T., Situmorang, K. S., Nurbaiti, L., Listya, A. C., Brilian, N. D., & Adelia, S. (2022). The influence of CEO Narcissism on financial performance with Corporate Social Responsibility (CSR) as a mediating variable. *Proceeding International Conference on Information Technology and Business*, 99-108.
- Fixen, M. (2020). Importance of generational corporate social responsibility perspective: A literature review. *Journal of Marketing Development and Competitiveness*, 14(1), 83-90. doi:<https://doi.org/10.33423/jmdc.v14i1.2773>
- Flammer, C. (2013). Corporate social responsibility and shareholder reaction: The environmental awareness of Investors. *Academy of Management Journal*, 56(3), 758-781. doi:<https://doi.org/10.5465/amj.2011.0744>
- Fry, L. W., & Egel, E. (2021). Global leadership for sustainability. *Sustainability*, 13(11), 1-27. doi:<https://doi.org/10.3390/su13116360>
- Gadenne, D., Sands, J., & Mia, L. (2012). The Association between Sustainability Performance Management Goals and Organisational Performance. *e-Journal of Social & Behavioural Research in Business*, 3(2), 27-42.
- García, C. J., & Herrero, B. (2022). Corporate entrepreneurship and governance: mergers and acquisitions in Europe. *Technological Forecasting and Social Change*, 182, 1-11. doi:<https://doi.org/10.1016/j.techfore.2022.121845>
- Ghardallou, W. (2022). Corporate sustainability and firm performance: The moderating role of CEO education and tenure. *Sustainability*, 14(6), 1-16. doi:<https://doi.org/10.3390/su14063513>
- Gounopoulos, D., Loukopoulos, G., & Loukopoulos, P. (2021). CEO Education and the Ability to Raise Capital. *Corporate Governance: An International Review*, 29(1), 67-99. doi:<https://doi.org/10.1111/corg.12338>
- Gresham, T. R., Kim, J., McDonald, J., Scoggins, N., Mostafavi, M., Park, B. B., . . . Smith, S. A. (2021). Safe and sustainable fleet management with data analytics and training. *2021 Systems and Information Engineering Design Symposium (SIEDS)*, 1-6. doi:<https://doi.org/10.1109/SIEDS52267.2021.9483746>
- Gunawan, J., & SeTin. (2019). The development of corporate social responsibility in accounting research: Evidence from Indonesia. *Social Responsibility Journal*, 15(5), 671-688. doi:<https://doi.org/10.1108/SRJ-03-2018-0076>

- Hariyanto, D. (2021). Effect of trading volume, market capitalization, firm size in explaining return on vultures. *Journal of Advanced Research in Economics and Administrative Sciences*, 2(2), 50-64. doi:<https://doi.org/10.47631/jareas.v2i2.228>
- Hicham, B., Soumeia, D., Fatima, S., Mohamed, T., & Amine, B. M. (2024). The impact of solid waste recycling on environmental security of countries according to the Environmental Performance Index (EPI) 2022: A study of leading International Models. *International journal of economic perspectives*, 18(9), 1444-1463.
- Ho, F. N., Wang, H.-M. D., Ho-Dac, N., & Vitell, S. J. (2019). Nature and relationship between corporate social performance and firm size: A cross-national study. *Social Responsibility Journal*, 15(2), 258-274. doi:<https://doi.org/10.1108/SRJ-02-2017-0025>
- Hönel, S., Ericsson, M., Löwe, W., & Wingkvist, A. (2023). Metrics as Scores: A tool-and analysis suite and interactive application for exploring context-dependent distributions. *Journal of Open Source Software*, 8(88), 1-7. doi:<https://doi.org/10.21105/joss.04913>
- Huang, R., & Wei, J. (2023). Does CEOs' green experience affect environmental corporate social responsibility? Evidence from China. *Economic Analysis and Policy*, 79, 205-231. doi:<https://doi.org/10.1016/j.eap.2023.06.012>
- Huong, N. T., & Vu, H. P. (2023). CEO foreign experience and firm performance: Does CEO tenure matter?. *Journal of Science and Technology*, 21(12), 7-11. doi:<https://doi.org/10.31130/ud-jst.2023.570e.12.2>
- Hussain, M. J., Tian, G., Ashraf, A., Khan, M. K., & Ying, L. (2023). Chief executive officer ability and corporate environmental sustainability information disclosure. *Business Ethics, the Environment & Responsibility*, 32(1), 24-39. doi:<https://doi.org/10.1111/beer.12485>
- Ishak, J. F. (2024). The role of earnings quality in the impact of earnings management and leverage on firm value. *International Journal of Financial, Accounting, and Management*, 5(4), 433-442. doi:<https://doi.org/10.35912/ijfam.v5i4.1204>
- Itan, I., Laudeciska, L., Karjantoro, H., & Chen, R. (2023). Corporate governance and environmental disclosure: Assessing the role of environmental performance. *Riset Akuntansi dan Keuangan Indonesia*, 8(2), 132-144. doi:<https://doi.org/10.23917/reaksi.v8i2.2457>
- Jaggia, S., & Thosar, S. (2021). CEO management style: Does educational background play a role?. *Managerial Finance*, 47(10), 1465-1485. doi:<https://doi.org/10.1108/MF-12-2020-0606>
- Jaskiewicz, P., Block, J. H., Combs, J. G., & Miller, D. (2017). The effects of founder and family ownership on hired CEOs' incentives and firm performance. *Entrepreneurship Theory and Practice*, 41(1), 73-103. doi:<https://doi.org/10.1111/etap.12169>
- Ji, X., Su, Y., Zhang, Y., & Wang, H. (2023). Making our firm more sustainable: The role of CEO vision communication of sustainability on sustainability performance. *SAGE Open*, 13(4), 1-20. doi:<https://doi.org/10.1177/21582440231205861>
- Juwita, A., & Jumali, T. (2020). Analisis pengaruh corporate governance dan ukuran perusahaan terhadap manajemen risiko pada perusahaan di Bursa Efek Indonesia. *Global Financial Accounting Journal*, 4(1), 38-51. doi:<https://doi.org/10.37253/gfa.v4i1.755>
- Kallias, A., Kallias, K., Tsalkamas, I., & Zhang, S. (2023). One size does not fit all: The conditional role of CEO Education on IPO Performance. *Journal of Business Research*, 157, 1-14. doi:<https://doi.org/10.1016/j.jbusres.2022.113560>
- Keller, T., Glaum, M., Bausch, A., & Bunz, T. (2023). The "CEO in Context" Technique Revisited: A Replication and Extension of Hambrick and Quigley (2014). *Strategic Management Journal*, 44(4), 1111-1138. doi:<https://doi.org/10.1002/smj.3453>
- Klingenberg, B., & Rothberg, H. N. (2020). The status quo of knowledge management and sustainability knowledge. *Electronic Journal of Knowledge Management*, 18(2), 136-148. doi:<https://doi.org/10.34190/EJKM.18.02.004>
- Kumar, M., Raj, N., & Singh, R. R. (2023). Ranking Indian Companies on sustainability disclosures using the GRI-G4 Framework and MCDM Techniques. *International Journal of Sustainable Development & Planning*, 18(9), 2791-2799. doi:<https://doi.org/10.18280/ijstdp.180917>
- Kussumardianadewi, B. D., Latief, Y., & Ilyas, T. (2024). Retrofitting green in office high rise building based on BIM-5D. *AIP Conference Proceedings*, 2710(1). doi:<https://doi.org/10.1063/5.0144083>

- Lashitew, A. A. (2023). When businesses go digital: The role of CEO attributes in technology adoption and utilization during the COVID-19 Pandemic. *Technological Forecasting and Social Change*, 189, 1-14. doi:<https://doi.org/10.1016/j.techfore.2023.122324>
- Leignel, J.-L., Ménager, E., & Yablonski, S. (2019). *Sustainable Enterprise Performance: A Comprehensive Evaluation Method*. London: John Wiley & Sons.
- Li, H., Hang, Y., Shah, S. G. M., Akram, A., & Ozturk, I. (2020). Demonstrating the impact of cognitive CEO on Firms' Performance and CSR Activity. *Frontiers in Psychology*, 11, 1-8. doi:<https://doi.org/10.3389/fpsyg.2020.00278>
- Loock, M., & Phillips, D. M. (2020). A firm's financial reputation vs. sustainability reputation: Do consumers really care?. *Sustainability*, 12(24), 1-17. doi:<https://doi.org/10.3390/su122410519>
- Loureiro, P., Dieguez, T., & Ferreira, I. (2022). Higher education as a driver for sustainable transformation and leadership. *International Journal of Multidisciplinary Research and Growth Evaluation*, 3(4), 270-277. doi:<https://doi.org/10.54660/anfo.2022.3.4.13>
- Miati, N. L. P. M., Ariyanto, D., Widanaputra, A. A. G. P., & Putri, I. G. A. M. A. D. (2026). Mapping sustainability performance in the Hospitality Industry: A systematic literature review and future research agenda. *Annals of Human Resource Management Research*, 6(1), 1-19. doi:<https://doi.org/10.35912/ahrmr.v6i1.3038>
- Miller, D., & Xu, X. (2020). CEO long-term orientation and elite University Education. *Strategic Organization*, 18(4), 520-546. doi:<https://doi.org/10.1177/1476127019840765>
- Mira, M. (2020). Does the Institutional ownership, Return On Asset and Leverage affect Company Value. *Point of View Research Accounting and Auditing*, 1(3), 88-94. doi:<https://doi.org/10.47090/povraa.v1i3.44>
- Navaretti, G. B., Castellani, D., & Pieri, F. (2022). CEO Age, shareholder monitoring, and the organic growth of European Firms. *Small Business Economics*, 59(1), 361-382. doi:<https://doi.org/10.1007/s11187-021-00521-5>
- Nguyen, T. H., & Ha, P. V. (2024). CEO foreign experience and firm leverage: Evidence from Vietnam. *Cogent Business & Management*, 11(1), 1-13. doi:<https://doi.org/10.1080/23311975.2024.2401156>
- Nogueira, E., Gomes, S., & Lopes, J. M. (2023). A meta-regression analysis of environmental sustainability practices and firm performance. *Journal of Cleaner Production*, 426, 1-14. doi:<https://doi.org/10.1016/j.jclepro.2023.139048>
- Okreglicka, M. (2023). Knowledge-oriented leadership to enhancing corporate sustainable performance in Small and Medium-Sized Enterprises: Development potential perspective. *European Conference on Knowledge Management*, 24(2), 988-997. doi:<https://doi.org/10.34190/eckm.24.2.1153>
- Pereira, C., Monteiro, A., Silva, D., & Lima, A. (2023). Do the levels of environmental sustainability disclosure and indebtedness affect the quality of earnings?. *Sustainability*, 15(4), 1-13. doi:<https://doi.org/10.3390/su15042871>
- Petchsakulwong, P., & Jansakul, N. (2018). Board of directors and profitability ratio of thai non-life insurers. *Kasetsart Journal of Social Sciences*, 39(1), 122-128. doi:<https://doi.org/10.1016/j.kjss.2017.11.005>
- Purwantini, C., Faisal, F., Januarti, I., & Dwiatmoko, I. A. (2018). The relationship between environmental performance and the extent of environmental disclosure. *Humanities & Social Sciences Reviews*, 7(4), 493-501. doi:<https://doi.org/10.18510/hssr.2019.7466>
- rahima, n., & shah, s. (2020). a micro-level implementation mechanism to enhance corporate sustainability performance: A social identity perspective. *International Journal of Innovation, Creativity and Change*, 11, 1-23.
- Rajesh, R. (2020). Exploring the sustainability performances of firms using environmental, social, and governance scores. *Journal of Cleaner Production*, 247. doi:<https://doi.org/10.1016/j.jclepro.2019.119600>
- Ramadanti, A., Mulyasari, W., & Astuti, K. D. (2023). Do Chief Executive Officer (CEO) characteristics influence financial performance? *Jurnal Riset Akuntansi Terpadu*, 16(2), 142-151. doi:<https://dx.doi.org/10.35448/jrat.v16i2.20948>

- Ratri, M. C., Harymawan, I., & Kamarudin, K. A. (2021). Busyness, tenure, meeting frequency of the CEOs, and corporate social responsibility disclosure. *Sustainability*, 13(10), 1-22. doi:<https://doi.org/10.3390/su13105567>
- Rios, M. M. M., Herremans, I. M., Wallace, J. E., Althouse, N., Lansdale, D., & Preusser, M. (2018). Strengthening sustainability leadership competencies through University Internships. *International Journal of Sustainability in Higher Education*, 19(4), 739-755. doi:<https://doi.org/10.1108/IJSHE-06-2017-0097>
- Sales, R., & Hayashi, V. (2025). Challenges and opportunities in assessing youth leadership. *Simpósio Brasileiro de Educação em Computação (EDUCOMP)*, 730-740. doi:<https://doi.org/10.5753/educomp.2025.4915>
- Schaltegger, S., & Wagner, M. (2006). Integrative management of sustainability performance, measurement and reporting. *International Journal of Accounting, Auditing and Performance Evaluation*, 3(1), 1-19. doi:<https://doi.org/10.1504/IJAAPE.2006.010098>
- Schmid, S., & Baldermann, S. (2021). CEOs' International work experience and compensation. *Management International Review*, 61(3), 313-364. doi:<https://doi.org/10.1007/s11575-021-00444-z>
- Setiawan, R., & Gestanti, L. (2022). CEO Characteristics, firm policy, and firm performance. *International Journal of Business and Society*, 23(1), 371-389. doi:<https://doi.org/10.33736/ijbs.4620.2022>
- Sevil, A., Cruz, A., Reyes, T., & Vassolo, R. (2022). When being large is not an advantage: How innovation impacts the sustainability of firm performance in natural resource industries. *Sustainability*, 14(23), 1-20. doi:<https://doi.org/10.3390/su142316149>
- Shah, M. U., & Guild, P. D. (2022). Stakeholder engagement strategy of technology firms: A review and applied view of Stakeholder Theory. *Technovation*, 114. doi:<https://doi.org/10.1016/j.technovation.2022.102460>
- Shahab, Y., Ntim, C. G., Yugang, C., Ullah, F., Li, H.-X., & Ye, Z. (2019). CEO attributes, sustainable performance, environmental performance, and environmental reporting: New insights from upper echelons perspective. *SSRN Electronic Journal*, 1-29. doi:<https://doi.org/10.2139/ssrn.3512591>
- Shukree, A. M., Arshad, M., Ismail, I. A., & Alias, S. N. (2023). Organization development and sustainability in Youth Organization. *International Journal of Academic Research in Business and Social Sciences*, 13(14), 124-137. doi:<https://doi.org/10.6007/ijarbss/v13-i14/18354>
- Siew-Boey, Y., & Hooy, C.-W. (2021). Foreign experience of CEOs and managerial risk taking. *Malaysian Journal of Economic Studies*, 58(2), 239-265. doi:<https://doi.org/10.22452/mjes.vol58no2.4>
- Silva, B. M. D., Ferreira, D. H. L., & Georges, M. (2019). Sustainable practices in the supply chain under the UN global compact perspective. *International Journal for Innovation Education and Research*, 7, 135-153. doi:<https://doi.org/10.31686/ijier.vol7.iss2.1332>
- Silvina, S., Robin, R., & Yuwono, W. (2022). The impact on firm performance: Evidence from CEO education. *Inovasi: Jurnal Ekonomi, Keuangan, dan Manajemen*, 18(1), 176-184. doi:<https://doi.org/10.30872/jinv.v18i1.10477>
- Sloan, S., Campbell, M. J., Alamgir, M., Lechner, A. M., Engert, J., & Laurance, W. F. (2019). Transnational conservation and infrastructure development in the heart of Borneo. *Plos One*, 14(9), 1-22. doi:<https://doi.org/10.1371/journal.pone.0221947>
- Soepriyanto, G., Erma Zudana, A., & Meiryani, M. (2024). Older and wiser? The impact of CEO age on firm's tax amnesty participation. *Cogent Business & Management*, 11(1), 1-15. doi:<https://doi.org/10.1080/23311975.2023.2296142>
- Soysa, R., Pallegedara, A., Sisira Kumara, M., Jayasena, D., & Samaranyake, M. (2022). Corporate characteristics and sustainability reporting: A systematic review and meta-analysis. *SSRN Electronic Journal*, 1-30. doi:<https://dx.doi.org/10.2139/ssrn.4106988>
- Stockemer, D., Stockemer, G., & Glaeser, J. (2019). *Quantitative Methods for the Social Sciences*. New York: Springer.
- Streimikiene, D., Mikalauskiene, A., Digriene, L., & Kyriakopoulos, G. (2021). Assessment of the Role of a Leader in Shaping Sustainable Organizational Culture. *Amfiteatru Economic*, 23(57), 483-503. doi:<https://doi.org/10.24818/ea/2021/57/483>

- Suherman, S., Mahfirah, T. F., Usman, B., Kurniawati, H., & Kurnianti, D. (2023). CEO characteristics and firm performance: evidence from a Southeast Asian Country. *Corporate Governance: The International Journal of Business in Society*, 23(7), 1526-1563. doi:<https://doi.org/10.1108/CG-05-2022-0205>
- Sumarga, E., Hein, L., Hooijer, A., & Vernimmen, R. (2016). Hydrological and economic effects of oil palm cultivation in Indonesian Peatlands. *Ecology and society*, 21(2), 1-19. doi:<https://doi.org/10.5751/es-08490-210252>
- Tjahjadi, B., Soewarno, N., & Mustikaningtiyas, F. (2021). Good corporate governance and corporate sustainability performance in Indonesia: A Triple bottom line approach. *Heliyon*, 7(3), 1-11. doi:<https://doi.org/10.1016/j.heliyon.2021.e06453>
- Trinh, V. Q., Salama, A., Li, T., Lyu, O., & Papagiannidis, S. (2023). Former CEOs chairing the board: Does it matter to corporate social and environmental investments?. *Review of Quantitative Finance and Accounting*, 61(4), 1277-1313. doi:<https://doi.org/10.1007/s11156-023-01184-x>
- Vajapeyam, S., Brown, D., Ziaei, A., Wu, S., Vezina, G., Stern, J., Jones, J. (2022). ADC histogram analysis of pediatric low-grade glioma treated with selumetinib: A report from the pediatric brain tumor consortium. *American Journal of Neuroradiology*, 43(3), 455-461. doi:<https://doi.org/10.3174/ajnr.a7433>
- Vokoun, M. (2017). Characteristics of the innovation activities of firms in Europe: A critical review of International differences. *Review of Economic Perspectives*, 17(3), 239-262. doi:<https://doi.org/10.1515/revecp-2017-0013>
- Vuorio, A. (2017). Young adults and sustainable entrepreneurship: The role of culture and demographic factors. *Journal for International Business and Entrepreneurship Development*, 10(3), 209-230. doi:<https://doi.org/10.1504/JIBED.2017.085499>
- Waddock, S., & Lozano, J. M. (2013). Developing more holistic management education: lessons learned from two programs. *Academy of Management Learning & Education*, 12(2), 265-284. doi:<https://doi.org/10.5465/amle.2012.0002>
- Wilhelm, D. G. A., & Talaulicar, T. (2019). Do CEOs impact their organizations' capacity for change and firm performance? An Empirical analysis. *Academy of Management Proceedings*, 2019(1). doi:<https://doi.org/10.5465/AMBPP.2019.10850abstract>
- Wiralestari, W. (2022). Quality of corporate social responsibility information in Indonesia. *Jurnal ASET (Akuntansi Riset)*, 14(1), 115-124. doi:<https://doi.org/10.17509/jaset.v14i1.39436>
- Xu, L. (2023). CEO general work experience and FDI-based internationalization. *Journal of Strategy and Management*, 16(2), 323-340. doi:<https://doi.org/10.1108/JSMA-06-2022-0112>
- Yang, M., Wang, J., & Yasmin, F. (2021). Does higher business education champion environmental sustainability for next generation of leaders? An assessment of In-School Students and Alumni's perspective. *Polish Journal of Environmental Studies*, 30(6), 1-16. doi:<https://doi.org/10.15244/pjoes/135715>
- Zhang, J., Xue, C., & Zhang, J. (2022). The impact of CEO Educational background on corporate risk-taking in China. *Journal of Risk and Financial Management*, 16(1), 1-16. doi:<https://doi.org/10.3390/jrfm16010009>
- Zhang, Y., Khan, U., Lee, S., & Salik, M. (2019). The influence of management innovation and technological innovation on organization performance. A mediating role of sustainability. *Sustainability*, 11(2), 1-21. doi:<https://doi.org/10.3390/su11020495>
- Zhou, H., Wang, Q., & Zhao, X. (2020). Corporate social responsibility and innovation: A comparative study. *Industrial Management & Data Systems*, 120(5), 863-882. doi:<https://doi.org/10.1108/IMDS-09-2019-0493>