CURRENT
Jurnal Kajian Akuntansi dan Bisnis Terkini
https://current.ejournal.unri.ac.id

ENVIRONMENTAL PERFORMANCE AS A MEDIATOR BETWEEN CHIEF EXECUTIVE OFFICER CHARACTERISTICS AND FINANCIAL PERFORMANCE

Salsa Shabrina Ramadianti[1], Romli Romli[2*]
[1,2] Department ofAccounting, Economic and Business, Jenderal Achmad Yani University, Cimahi City, Indonesia
*Email: romli.ak@lecture.unjani.ac.id

Keywords

STEM CEO, Female CEO, Environmental Performance, Financial Performance

Article informations

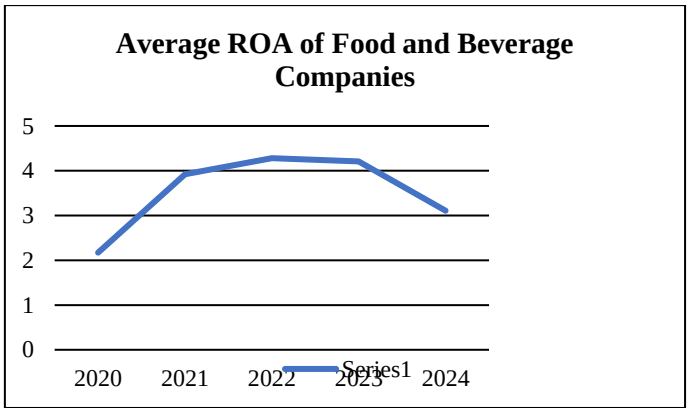
Received:
2025-11-19
Accepted:
2026-01-28
Available Online:
2026-03-01

Abstract

The food and beverage manufacturing subsector faces increasing environmental pressure due to intensive resource use, waste generation, and rising stakeholder demands for sustainable practices. In this context, financial performance cannot be explained solely by managerial characteristics without considering environmental mechanisms. This study examines whether environmental performance mediates the relationship between CEO characteristics—specifically STEM educational background and female leadership—and financial performance. Drawing on upper echelon theory and stakeholder theory, the study investigates 50 purposively selected food and beverage companies listed on the Indonesia Stock Exchange during 2020–2024. Data were analyzed using path analysis and the Sobel test. The findings indicate that STEM CEOs do not significantly affect financial performance, whereas female CEOs and environmental performance have significant positive effects. Moreover, environmental performance mediates the influence of both STEM and female CEOs on financial performance. This study contributes by positioning environmental performance as a key explanatory mechanism that clarifies how CEO characteristics translate into financial outcomes in environmentally sensitive industries.

INTRODUCTION

The food and beverage sector is one of the sectors that consistently contributes to the Indonesian economy. The Ministry of Industry reported that in the first quarter of 2024, this sector contributed 39,91% to non-oil and gas Gross Domestic Product (GDP) and 6,97% to national Gross Domestic Product (GDP), with growth reaching 5,87%, an increase from 5,33% in the previous period (Owo, 2024). Behind this significant contribution, company performance needs to be supported by good financial performance, as financial performance reflects a company's ability to generate profits and is a key indicator of its operational success (Siregar et al., 2022). One commonly used indicator is Return on Assets (ROA), which shows the effectiveness of a company in utilizing its assets to generate profits (Hayaah, 2023). However, the fact is that the average Return on Assets in food and beverage companies fluctuated from 2020 to 202024, as shown in Figure 1.



Source: Annual Report (Data processed by researchers, 2025)

Figure 1.
Average ROA of Food and Beverage Companies 2020-2024

Based on Figure 1, in 2020-2021, the average ROA increased from 2,17% to 3,92%, an increase of 1,75% from the previous year. In 2021-2022, the average ROA increased from 3,92% to 4,28%, an increase of 0,36% from the previous year. In 2022-2023, the average ROA decreased from 4,28% to 4,21% a decline of 0,07%. In 2023-2024, the average ROA decreased from 4,21% to 3,11% a decline of 1,10%. This condition was caused by increasingly fierce competition between similar companies, fluctuating sales, or company performance that could affect profits. One food and beverage company, PT Sentra Food Indonesia Tbk. (FOOD), experienced a continuous decline in financial performance due to fluctuations in raw materials prices, declining global purchasing power, and increasingly fierce competition among similar companies. In 2020, the company recorded an ROA of 15,37% which fell to –48,88% in 2024.

To overcome this condition, companies need to implement innovative and long-term strategies supported by corporate governance, which cannot be separated from the role of the CEO as the main decision maker in the organization, including decisions related to financial performance (Karinda et al., 2022; Kendrila et al., 2022; Meiliana & Hastuti, 2020). From the perspective of upper echelon theory, a company's financial performance is influenced by the characteristics of its CEO, including their educational background in Science, Technology, Engineering, and Mathematics (STEM) (Chua et al., 2025; Jao et al., 2022; Rizki et al., 2024). STEM CEOs generally have strong analytical and technical problem-solving skills and are oriented towards the utilization of new technologies and innovations within the company, which has the potential to improve operational efficiency and company performance (Cahyono et al., 2024; Rizki et al., 2024). Several studies show that STEM CEOs are able to improve financial performance through the application of technology and innovation-based strategies (Rizki et al., 2024). However, these findings differ from the research conducted by Chua et al. (2025), which shows that STEM CEOs have a negative effect on financial performance.

In addition to educational background, the presence of female CEOs can also affect financial performance. Female CEOs are considered capable of providing different perspectives, being more cautious in taking risks, having better ethics than female CEOs, understanding consumer needs more deeply, and being able to provide competitive advantages for companies that can improve their financial performance (Hazzaa et al., 2024; Yuniarti et al., 2023). Empirical evidence regarding female CEOs is still diverse. Some studies find that female CEOs have a positive effect on financial performance (Hazzaa et al., 2024; Yuniarti et al., 2023), while other studies show that female CEOs have a negative effect on financial performance (Raharjanti et al., 2023).

Inconsistencies in previous studies indicate that there are other factors that can bridge the relationship between CEO characteristics and financial performance, namely environmental performance. Current, food and beverage companies are facing significant environmental

challenges, including waste management, energy consumption, and resource efficiency, so that their activities are not only focused on profit but also on fulfilling environmental responsibilities (Hayaah, 2023). This is in line with stakeholder theory, which emphasizes that companies need to pay attention to all stakeholders, not just capital owners (Afazis & Handayani, 2020). Companies with good environmental performance tend to gain higher level of trust from stakeholders and are able to provide assurance to stakeholders (Siregar et al., 2022). Increased consumer awareness of environmental issues also encourages companies to develop environmentally friendly products and production processes, thereby potentially increasing the competitiveness and profitability of the company (Zhang et al., 2025).

The role of a CEO, especially a STEM CEO, is very important in promoting environmental performance. STEM CEOs have the ability to understand and implement environmentally friendly strategies through the application of green technology, thereby creating a culture of environmental responsibility. This responsibility can ultimately improve a company's environmental performance (Cahyono et al., 2024; Mali & Amin, 2021; Tantri et al., 2025). Research conducted by Cahyono et al. (2024) shows that STEM CEOs have a positive effect on environmental performance, while Suryaningrum & Ratnawati (2024) state in their research that environmental performance has a positive effect on financial performance. In addition, female CEOs can also encourage corporate responsibility towards the environment, as female CEOs tend to be more responsible towards the environment by adopting renewable energy systems, participating in environmental initiatives, and disseminating non-financial information to stakeholders (Gallego-Sosa et al., 2020). This shows that female CEOs play an important role in corporate strategy and can improve environmental performance (Sumarta et al., 2021). The results of research conducted by Hsu et al. (2022) state that female CEOs have a positive effect on environmental performance, and research conducted by Yanti & Annisa (2023) shows that environmental performance has a positive effect on financial performance.

Although previous studies have examined the relationship between CEO characteristics and financial performance, empirical findings remain inconsistent, especially with regard STEM CEOs and female CEOs. Some studies have found a positive effect, while others have found a negative effect. In addition, previous studies have mostly focused on direct effects and rarely explain the mechanisms through which CEO characteristics influence financial performance. Therefore, environmental performance is used as a mediator of the relationship between CEO characteristics and financial performance. This study can thus make an empirical contribution to addressing the inconsistency of previous findings and adding to the literature on the relationship between STEM CEOs, female CEOs, environmental performance, and financial performance.

HYPOTHESIS DEVELOPMENT

The Influence of STEM CEOs on Financial Performance

The CEO's educational background in Science, Technology, Engineering, and Mathematics (STEM) reflects analytical skills and an orientation towards technology-based innovation, which is relevant to the needs of food and beverage companies in order to support long-term business sustainability. This relationship can be explained through the upper echelon theory, where STEM CEOs tend to utilize a data-driven approach in strategic decision-making, particularly in identifying product innovation opportunities and business process efficiency. Therefore, the presence of STEM CEOs is increasingly important, in line with the growing role of technology in an increasingly competitive business environment (Chua et al., 2025; Rizki et al., 2024). This condition can open up new sources of revenue, which have the potential to optimally improve financial performance (Cahyono et al., 2024; Rizki et al., 2024). Research by Nguyen & Fan (2022) supports the idea that STEM CEOs have an impact on financial performance.

H_1: STEM CEOs have a positive impact on Financial Performance.

The Influence of Female CEOs on Financial Performance

Female CEOs are generally associated with a more interactive, participatory, meticulous, and cautious leadership style when it comes to risk-taking (Jao et al., 2022; Putri et al., 2021; Yuniarti et al., 2023). Based on upper echelon theory, these characteristics enable female CEOs to provide new perspectives that can drive innovation and more measured and responsive strategic decision-making in response to market dynamics. In the food and beverage industry, female CEOs are increasingly relevant given the industry's sensitivity to consumer preferences and market trends. Therefore, the consumer-oriented leadership style of female CEOs is considered capable of producing more accurate strategic decisions, which ultimately have an impact on improving the company's financial performance (Hazzaa et al., 2024; Suprapto et al., 2024). This is supported by research Hazzaa et al. (2024) which states that female CEOs have a positive impact on financial performance.

H_2: Female CEOs have a positive effect on Financial Performance.

The Influence of Environmental Performance on Financial Performance

Environmental performance reflects a company's ability to manage the impact of its operations on the environmental in a responsible manner that exceeds its legal obligations (Suryaningrum & Ratnawati, 2024). This ability is in line with stakeholder theory, whereby environmental practices can increase stakeholder trust, strengthen reputation, and reduce operational and regulatory risks. The importance of this relationship is even more relevant in the food and beverage industry because this industry depends on the quality of raw materials, food safety, and efficient waste and resource management, so that good environmental practices directly affect the reputation and trust of stakeholders, which ultimately has a positive impact on financial performance. This is supported by research conducted by Siregar et al. (2022) and Yuniarti et al. (2023), which states that environmental performance has an influence on financial performance.

H_3: Environmental Performance has a positive effect on Financial Performance.

Environmental Performance Mediates the Influence of STEM CEOs on Financial Performance

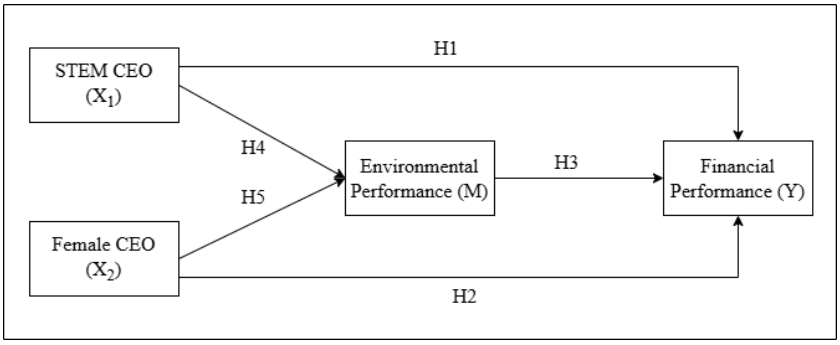
The technical and analytical understanding possessed by STEM CEOs enables companies to adopt more efficient and sustainable environmentally friendly technologies, allowing STEM CEOs to contribute to creating environmentally conscious companies through improved environmental performance (Cahyono et al., 2024). Therefore, companies led by STEM CEOs will have better environmental performance than companies not led by STEM CEOs. Good environmental performance can help reduce operational risks, particularly protests from stakeholders. Environmental performance is also used as a form of corporate accountability to stakeholders. Therefore, companies with good environmental performance will receive positive responses from stakeholders, which can increase the company's profits in the long term, thereby improving financial performance (Angelina & Nursasi, 2021; Hayaah, 2023). This is supported by previous research showing that STEM CEOs have a positive effect on environmental performance (Cahyono et al., 2024) and that environmental performance has a positive effect on financial performance (Rahayudi & Apriwandi, 2023).

H_4: Environmental Performance mediates the effect of STEM CEOs on Financial Performance.

Environmental Performance Mediates the Influence of Female CEOs on Financial Performance

Female CEOs play a strategic role in shaping corporate decisions, including policies related to the environment. Female CEOs tend to be more responsible towards the environment, more effective in implementing environmentally friendly strategies, and more transparent in reporting environmental activities. This encourages companies to carry out environmental management activities that can improve the company's environmental performance. Therefore, it can be said that companies with female CEOs tend to have better environmental performance (Gallego-Sosa et al., 2020; Sumarta et al., 2021). Good environmental performance demonstrates a company's concerns for the environment, which can meet the interests of stakeholders. Thus, companies with good environmental performance can increase stakeholder trust and provide a competitive advantage for the company in the future, which is expected to improve the company's financial performance (Yuniarti et al., 2023). This is supported by research by Hsu et al. (2022), which states that female CEOs have a positive influence on environmental performance, and research by Yanti & Annisa (2023), which states that environmental performance has a positive influence on financial performance.

H_5: Environmental Performance mediates the influence of Female CEOs on Financial Performance.



Source: Data processed by researchers, 2025

Figure 2.
Research Model

RESEARCH METHOD

Population and Sample

The population in this study consisted of food and beverage manufacturing companies listed on the Indonesia Stock Exchange from 2020 to 2024, with a total of 101 companies. The sample selection was conducted using non-probability sampling method through purposive sampling based on specific criteria tailored to the research needs, resulting in a research sample of 50 companies observed over 5 years, yielding a total of 250 firm-year observations. The sampling criteria are shown in Table 1.

Table 1.
Sample Criteria

No	Criteria	Amount
1	Food and beverage manufacturing companies listed on the Indonesia Stock Exchange from 2020 to 2024	101
2	Manufacturing companies in the food and beverage sub-sector that did not publish annual reports on Indonesia Stock Exchange and their respective official websites consecutively from 2020 to 2024	(51)
Number of companies		50
Year of observation		5
Number of samples during the observation year		250

Source: Data processed by researchers, 2025

There were 10 outlier observations in this study, resulting in a total of 240 observations used. Outliers in this study were identified using IBM SPSS Statistic version 27 through boxplot analysis to detect extreme data in each research variable, ensuring that the treatment of extreme data had a clear and accountable methodological basis. The treatment of outliers was carried out selectively based on data recording errors and their effect on the fulfillment of statistical assumptions. The deletion of observation data was carried out methodologically and transparently, so that changes in the sample size had a clear statistical basis. Thus, the treatment of outliers in this study aimed to maintain the validity, reliability, and accuracy of the statistical inferences produced.

Data Collection Techniques

In this study, data collection was conducted through a literature study by gathering data related to the research object through literature, namely by studying, researching, and reviewing reading sources and various previous studies, such as research journals related to this study. The documentation method was carried out by reviewing relevant documents from both literature and internet searchees to obtain the information and data needed to support the study. These documents included records of past events and annual reports published by the company.

Operational Definitions

Table 2.
Operational Variables

Variable	Definition	Measurement
Independent Variable		
Science, Technology, Engineering, and Mathematics (STEM) CEO	A CEO with a degree in one or more fields of Science, Technology, Engineering, and Mathematics (Harymawan et al., 2025).	Dummy variable (value code 1 for CEOs STEM and value code 0 for CEOs non-STEM) (Cahyono et al., 2024).
Female CEO (X_2)	A woman who serves as the highest-ranking executive in a company's management structure (Hazzaa et al., 2024).	Dummy variable (value code 1 for female CEOs and value code 0 for male CEOs) (Hazzaa et al., 2024).
Mediating Variable		
Environmental Performance (M)	A company's ability to preserve the environment in which it operates (Angelina & Nursasi, 2021).	PROPER (5 = Gold, 4 = Green, 3 = Blue, 2 = Red, 1 = Black) (Rahayudi & Apriwandi, 2023).
Dependent Variable		
Financial Performance (Y)	A corporate objective that reflects the company's ability to generate profits (Hayaah, 2023).	*Return on Assets* $\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}}$ (Angelina & Nursasi, 2021).

Source: Data processed by researchers, 2025

Analysis Techniques

This study uses path analysis as the main analysis method to test the direct and indirect causal relationships between STEM CEOs, female CEOs, environmental performance, and financial performance. Path analysis was chosen based on the research objectives, model structure, and data characteristics, making this method more appropriate than SEM-PLS because all variables are measured using single indicators that are objective and directly observable, thus eliminating the need for measurement model testing as in SEM-PLS. In addition, the purpose of this study is to test hypotheses that have been clearly formulated based on theory and previous research, so path analysis is considered more appropriate for testing

direct and indirect causal relationships, particularly the mediating role of environmental performance. The data analysis process in this study was conducted using IBM SPSS Statistics version 27.

RESEARCH RESULTS AND DISCUSSION

Descriptive Statistical Test Results

The following are the descriptive statistical test results for this study:

Table 3.
Descriptive Statistical Test Results Frequency Table

Frequency Table				
STEM CEO				
	Frequency	Percent	Valid Percent	Cumulative Percent
Non-STEM CEO	186	74.4	74.4	74.4
STEM CEO	64	25.6	25.6	100.0
Total	250	100.0	100.0	
Female CEO				
	Frequency	Percent	Valid Percent	Cumulative Percent
Male CEO	224	89.6	89.6	89.6
Female CEO	26	10.4	10.4	100.0
Total	250	100.0	100.0	

Source: Data processing using SPSS 27, 2025

Table 4.
Descriptive Statistical Test Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Environmental Performance	250	2.00	5.00	3.1120	0.43383
Financial Performance	250	-48.88	60.00	5.4990	9.60816
Valid N (listwise)	250				

Source: Data processing using SPSS 27, 2025

Based on Table 3, the results of descriptive statistical analysis show that the independent variable (X_1), namely STEM CEOs, numbered 64 out of a total of 250, with a percentage of 25,6%, while non-STEM CEOs numbered 186 out of a total of 250, with a percentage of 74,4%. The independent variable (X_2), namely female CEOs, numbered 26 out of a total 250, with a percentage of 10,4%, while male CEOs numbered 224 out of a total 250, with a percentage of 89,6%. Meanwhile, in Table 4, the mediating variable (M), namely environmental performance, has a minimum value of 2,00, a maximum value of 5,00, a mean value of 3,1120, and a standard deviation value of 0,43383. The dependent variable (Y), namely financial performance, has a minimum value of -48,88, a maximum value of 60,00, and a mean value of 5,4990, and a standard deviation value of 9,60816.

Hypothesis Testing

This study includes three direct hypothesis tests and two indirect hypothesis tests. A hypothesis is accepted if the t-value is greater than the t-table value and the significance value is less than 0,05. Conversely, if the t-value is less than the t-table value and the significance value is greater than 0,05, the hypothesis is rejected. The following are the results of the hypothesis tests in this study:

Table 5.
Hypothesis Tests Results

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.422	3.097		-0.459	0.646
	STEM CEO	1.756	0.940	0.120	1.868	0.063
	Female CEO	3.260	1.365	0.156	2.387	0.018
	Environmental Performance	1.984	0.963	0.135	2.061	0.040

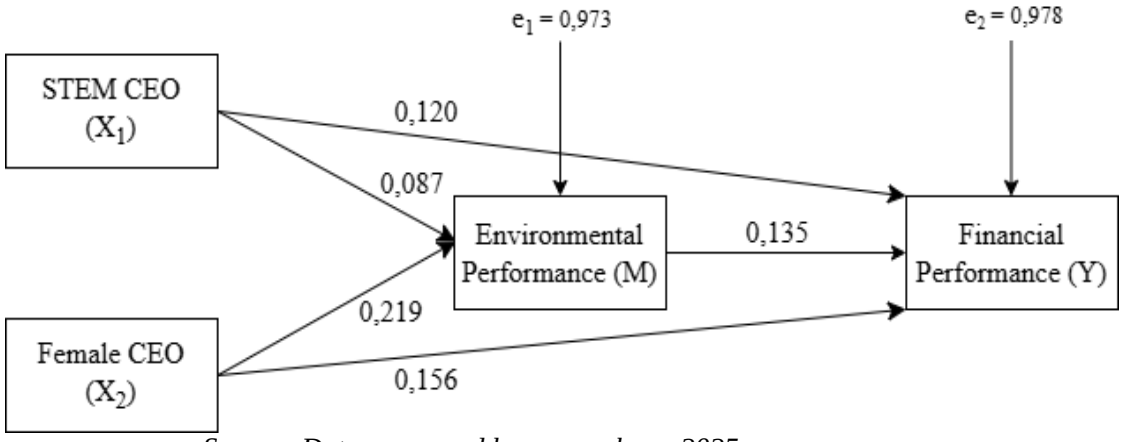
a. Dependent Variable: Financial Performance

Source: Data processing using SPSS 27, 2025

Based on the results of multiple linear regression analysis in Table 5, the STEM CEO variable (X_1) has a t-value smaller that the t-table (1,868 < 1,970) and a significance value greater than 0,05 (0,063 > 0,05). This means that STEM CEOs do not have a positive effect on financial performance, so the first hypothesis is rejected. Meanwhile, female CEO (X_2) has a t-value of 2,378 and a t-table value of 1,970, which means that the t-value is greater than the t-table value (2,387 > 1,970) and the significance value is 0,018 < 0,05. This means that female CEOs have a significant positive effect on financial performance, so the second hypothesis is accepted. The environmental performance variable (M) has a t-value greater that the t-table value (2,061 > 1,970) and a significance value less that 0,05 (0,040 < 0,05). This means that environmental performance has a significant positive effect on financial performance, so the third hypothesis is accepted.

Path Analysis Results

Path analysis is used to test the effect of CEO characteristics on financial performance through environmental performance as a mediating variable. The following is the path analysis model in this study:



Source: Data processed by researchers, 2025

Figure 3.
Path Analysis Model

Based on Figure 3, the path analysis results are as follows:

Table 6.
Path Analysis Results

Direct Effect	
STEM CEO → Financial Performance	0.120
Female CEO → Financial Performance	0.156
Indirect Effect	
STEM CEO → Environmental Performance → Financial Performance	0.011
Female CEO → Environmental Performance → Financial Performance	0.029
Total Effect	
STEM CEO → Environmental Performance → Financial Performance	0.131
Female CEO → Environmental Performance → Financial Performance	0.185

Source: Data processing using SPSS 27, 2025

Based on Table 6, it is known that the total effect of STEM CEOs on financial performance through environmental performance is 0,131. This result shows that indirectly, X_1 through M affects Y. The total effect of female CEOs on financial performance through environmental performance is 0,185. This result shows that indirectly, X_2 through M affects Y.

Sobel Test

The Sobel test was conducted to examine the significance of the indirect effect of the independent variable on the dependent variable through the mediating variable. The following are the results of the Sobel test in this study:

Table 7.
Sobel Test Results

	t
STEM CEO → Environmental Performance → Financial Performance	2,032
Female CEO → Environmental Performance → Financial Performance	1,718

Source: Data processed by researchers, 2025

Based on Table 7, the Sobel test on the effect of STEM CEOs on financial performance through environmental performance obtained a t-value of 2,032 and a t-table value with a significance level of 0,05 of 1,651. Thus, the t-value is greater than the t-table value (2,032 > 1,651). Thus, the main finding of this study shows that environmental performance can be a mediator of the influence of STEM CEOs on financial performance, so the fourth hypothesis is accepted. Meanwhile, the Sobel test for the effect of female CEOs on financial performance through environmental performance produced a t-value of 1,718 and a t-table value with a significance level of 0,05 of 1,651. Thus, the t-value is greater than the t-table value (1,718 > 1,651). Therefore, the main findings of this study indicate that environmental performance can be a mediator the influence of female CEOs on financial performance, so the fifth hypothesis is accepted.

Although the Sobel test is a commonly used technique for testing the significance of mediation effects, this method has a number of limitations that need to be considered. The Sobel test assumes that the sample size is large and the mediation coefficient value is normally distributed, but this assumption has been widely criticized because the Sobel test only relies on the coefficient value and standard error, making it less capable of interpreting the complexity of non-linear relationships. Therefore, there are alternatives for testing the significance of the mediation effect, such as bootstrapping. This technique is a non-parametric approach that does not assume the distribution form of variables and can be used with small sample sizes. This approach is considered more robust and provides more reliable estimates of mediation effects,

thereby increasing the strength of statistical inference in research. However, in this study, the sample size used was large and the mediation coefficient values were normally distributed, so the Sobel test was used to test the significance of the mediation effect.

The Influence of STEM CEOs on Financial Performance

Based on the hypothesis test results in Table 5, the calculated t-value is smaller than the table t-value (1,868 < 1,970) and the significance value is greater than 0,05 (0,063 > 0,05). These results indicate that STEM CEOs have not been able to contribute effectively to strategic decision-making due to a lack of understanding in measuring leadership and managerial skills, especially in managing the complex food and beverage industry environment, which relies not only on technological innovation but also on market understanding, consumer preferences, and supply chain management capabilities (Chua et al., 2025). The upper echelon theory explains that educational background can shape a CEO's perspective, but strategic decisions are still influenced by the interaction between individual characteristics and the organizational scope. Thus, STEM competencies tend to be more effective when supported by adequate resources and an industrial environment that allows technological innovation to be directly translated into financial performance. Therefore, the absence of STEM CEO influence in this study reflects the limitations of strategic implementation in the food and beverage industry rather than the weakness of STEM CEO characteristics. The findings of this study are in line with the research by Chua et al. (2025), which shows that STEM CEOs have a negative effect on financial performance.

The Influence of Female CEOs on Financial Performance

Based on the results of the hypothesis test in Table 5, the calculated t-value is greater than the table t-value (2,387 > 1,970) and the significance value is 0,018 < 0,05. These results indicate that companies with female CEOs tend to show better financial performance. This finding indicates that female CEOs have strategic significance, particularly in the food and beverage industry, which is related to consumer preferences and market dynamics. Female CEOs tend to bring a more inclusive leadership approach, are cautious in risk-taking and are sensitive to change in consumer behavior, which are important factors in the food and beverage industry. In upper echelon theory, the characteristics of female CEOs are reflected in a decision-making style that is more oriented towards long-term sustainability. This approach can improve operational effectiveness and strengthen stakeholder trust, thereby having a positive impact on financial performance. These results are in line with the research by Hazzaa et al. (2024), which found that female CEOs have a positive effect on financial performance.

The Influence of Environmental Performance on Financial Performance

Based on the hypothesis test results in Table 5, the calculated t-value is greater than the table t-value (2,061 > 1,970) and the significance value is less than 0,05 (0,040 < 0,05). These results indicate that environmental performance plays a strategic role in improving the financial performance of food and beverage companies. This finding confirms that good environmental practices are not merely a regulatory obligation, but also serve as an economic value. In the food and beverage industry, environmental issues greatly influence stakeholder perceptions. From stakeholder theory perspective, this positive impact arises because companies are able to demonstrate their commitment to stakeholder interests, thereby minimizing social risks and strengthening long-term relationships with stakeholders who have strategic value. This support can create more stable financial performance. The results of this study are consistent with the studies by Siregar et al. (2022) and Yuniarti et al. (2023), which show that environmental performance has a positive effect on financial performance.

Environmental Performance Mediates the Influence of STEM CEOs on Financial Performance

Based on the results of path analysis and Sobel's test in Table 7, the calculated t-value is greater than the t-table value (2,032 > 1,651). This indicates that although STEM CEOs do not have a direct effect on financial performance, the results of the study show that environmental performance is able to bridge this relationship. This finding indicates that the contribution of STEM CEOs is more effective when manifested through policies and strategies oriented towards improving environmental performance. In the context of the food and beverage industry, the analytical and technical capabilities of STEM CEOs can be utilized to improve production process efficiency and environmentally friendly innovation. Upper echelon theory explains that a STEM background is reflected in the tendency of CEOs to make decisions explains based on data and technology relevant to improving environmental performance. Furthermore, stakeholder theory explains that improving environmental performance can increase stakeholder trust and reduce regulatory risk, which ultimately has a positive impact on financial performance. The results of this study are in line with the research by Cahyono et al. (2024), which revealed that STEM CEOs have a positive effect on environmental performance, and Rahayudi & Apriwandi (2023), which stated that environmental performance has a positive effect on financial performance. It can be concluded that environmental performance mediates the influence of STEM CEOs on financial performance.

Environmental Performance Mediates the Influence of Female CEOs on Financial Performance

Based on the path analysis and Sobel's test in Table 7, the calculated t-value is greater that the t-table value (1,718 > 1,651). This means that environmental performance mediates the influence of female CEOs on financial performance. This finding reinforces the argument that female CEOs not only have a direct impact on financial performance, but also through improved environmental performance. In the food and beverage industry, environmentally sensitive strategic decisions are particularly relevant because they are directly related to the future sustainability of the business. Based on upper echelon theory, the characteristics of female CEOs are reflected in their tendency to make decisions that are more responsive to stakeholder interests. In line with stakeholder theory, the improvement in environmental performance resulting from these decisions strengthens the company's reputation and stakeholder support, which ultimately drives financial performance. This is consistent with the research by Hsu et al. (2022), which states that female CEOs have a positive effect on environmental performance, and Yanti & Annisa (2023), which states that environmental performance has a positive effect on financial performance. It can therefore be concluded that environmental performance mediates the influence of female CEOs on financial performance.

CONCLUSION

This study shows that STEM CEOs do not have a positive effect on financial performance. These findings indicate that technical educational characteristics are not sufficient to produce economically valuable strategic decisions, thereby expanding the understanding of upper echelon theory that the influence of CEO characteristics on company performance is contextual and requires supporting mechanisms. Meanwhile, female CEOs have been proven to have a positive effect on financial performance, confirming that the demographic dimensions of top leadership play an important role in the quality of strategic decision-making. The main findings show that environmental performance mediates the impact of STEM CEOs and female CEOs on financial performance. This finding reinforces stakeholder theory by showing that environmental practices serve as a strategic pathway linking leadership characteristics to the creation of corporate economic value.

Theoretically, this study confirms the importance of mediation in explaining the relationship between CEO characteristics and financial performance within the upper echelon theory framework. This study also provides empirical support for stakeholder theory by placing environmental performance as a strategic instrument in improving financial performance. Practically, companies are advised to increase female representation in top executive positions and integrate environmental performance as a key long-term strategy. In addition, strengthening the managerial and leadership capacities of STEM CEOs is necessary so that technical competencies can contribute effectively to financial performance.

Research Limitations

The limitations of this study include the limited sample size, which only includes food and beverage manufacturing companies listed on the Indonesia Stock Exchange, the limited research period, which only covers from 2020 to 2024, the fact that this study only measures financial performance using one type of measurement, namely Return on Assets (ROA), and the limited number of independent variable that affect financial performance, namely STEM CEOs and female CEOs.

Research Suggestions

Further research should expand the sample size by including companies from other sectors listed on the Indonesia Stock Exchange, extend or update the research period, use more than one financial performance indicator, and add other independent variables that could potentially affect financial performance.

REFERENCES

Afazis, R. D., & Handayani, S. (2020). Penerapan Akuntansi Manajemen Lingkungan Terhadap Kinerja Keuangan: Kinerja Lingkungan Sebagai Pemediasi. *Jurnal Bisnis dan Akuntansi*, *22*(2), 257–270. https://doi.org/10.34208/jba.v22i2.702

Angelina, M., & Nursasi, E. (2021). Pengaruh Penerapan Green Accounting Dan Kinerja Lingkungan Terhadap Kinerja Keuangan Perusahaan. *Jurnal Manajemen Dirgantara*, *12*(2), 211–224. https://doi.org/10.56521/manajemen-dirgantara.v14i2.286

Cahyono, S., Ardianto, A., & Nasih, M. (2024). Breaking Barriers: CEOs STEM Educational Background and Corporate Climate Change Disclosure. *International Journal of Accounting & Information Management*, *32*(4), 651–684. https://doi.org/10.1108/IJAIM-10-2023-0268

Chua, M.-S., Roslen, S. N. M., Nizar, N., Chin, H.-C., & Hen, K. W. (2025). *CEO Educations and Bank's Performance in Malaysia: Evidence from STEM CEO, Finance CEO, MBA CEO and CEO Education Level*. *34*.

Gallego-Sosa, C., Fernández-Torres, Y., & Gutiérrez-Fernández, M. (2020). Does Gender Diversity Affect the Environmental Performance of Banks? *Sustainability*, *12*. https://doi.org/10.3390/su122310172

Harymawan, I., Setiawan, D., Adhariani, D., & Paramayuda, A. A. R. (2025). Innovation over ESG Performance? The Trade-Offs of STEM Leadership in Top Sustainable Firms. *Journal of Risk and Financial Management*, *18*(7), 372. https://doi.org/10.3390/jrfm18070372

Hayaah, A. N. (2023). Pengaruh Penerapan Green Accounting Dan Kinerja Lingkungan Terhadap Kinerja Keuangan Perusahaan Manufaktur Sub Sektor Logam Dan Sejenisnya Yang Terdaftar Di Bursa Efek Indonesia. *Jurnal Kajian Ilmiah Akuntansi Fakultas Ekonomi UNTAN (KIAFE)*, *1*(2), 121–140.

Hazzaa, O. T., Abdullah, D. F., & Sadaa, A. M. (2024). Influence of CEO Characteristics and Audit Committee on Financial Performance: Evidence from Iraq. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*.

https://doi.org/10.1016/j.joitmc.2024.100290

Hsu, P.-H., Li, K., & Pan, Y. (2022). The Eco Gender Gap in Boardrooms. *Institute-Finance Working Paper*. https://dx.doi.org/10.2139/ssrn.4281479

Jao, R., Asri, M., Holly, A., & Rivaldy. (2022). Pengaruh Karakteristik Dewan Direksi Terhadap Kinerja Keuangan dengan Reputasi Perusahaan Sebagai Variabel Mediasi. *Jurnal Riset Akuntansi Aksioma*, *21*(1), 1–18. https://doi.org/10.29303/aksioma.v21i1.148

Karinda, D. N., Suranto, F., Rinaningsih, & Farhana, S. (2022). Karakteristik Dewan dan Kinerja Keuangan Perusahaan di Indonesia. *Journal of Accounting & Management Innovation*, *6*(1), 96–121.

Kendrila, N., Azmi, Z., & Samsiah, S. (2022). Pengaruh Karakteristik Komposisi Manajemen Puncak Terhadap Kinerja Keuangan. *SINTAMA: Jurnal Sistem Informasi, Akuntansi dan Manajemen*, *2*(1), 30–43.

Mali, M. A. Y., & Amin, A. (2021). Peran Gender Dewan Direksi Sebagai Pemoderasi Corporate Social Responsibility Terhadap Kinerja Keuangan. *Jurnal Sosial Ekonomi dan Humaniora*, *7*(2), 166–172.

Meiliana, V., & Hastuti, R. T. (2020). Faktor-Faktor yang Mempengaruhi Kinerja Keuangan Perusahaan yang Terdaftar di BEI Periode 2016-2018. *Jurnal Paradigma Akuntansi Tarumanagara*, *2*(2), 902–911. https://doi.org/10.24912/jpa.v2i2.7673

Nguyen, H. L., & Fan, P. (2022). CEO Education and Firm Performance: Evidence from Corporate Universities. *Administrative Sciences*, *12*(4), 145. https://doi.org/10.3390/admsci12040145

Owo. (2024). *Industri Makanan dan Minuman Miliki Peran Penting Untuk Pertumbuhan Ekonomi*. Neraca.Co.Id. https://www.neraca.co.id/article/201073/industri-makanan-dan-minuman-miliki-peran-penting-untuk-pertumbuhan-ekonomi#:~:text=NERACA.%20Jakarta%20%2D%20Direktur%20Industri%20Makanan%2C%20Hasil,peran%20penting%20dalam%20menopang%20pertumbuhan%20ekonomi%20Indonesia

Putri, I. D. R., Waharini, F. M., & Purwantini, A. H. (2021). Pengaruh Gender, Usia, dan Kebangsaan Asing terhadap Kinerja Keuangan Perusahaan. *Accounting Research Journal*, *1*(1), 17–30.

Raharjanti, R., Murtiasri, E., Eviyanti, N., Asrori, M., & Haris, M. (2023). Keberagaman Gender, Struktur Kepemilikan serta Kinerja Perusahaan Real Estate. *Journal of Accounting Research*, *12*(01), 75–84. https://doi.org/10.30591/monex.v12i1.4286

Rahayudi, A. M. P., & Apriwandi. (2023). Kinerja Lingkungan, Biaya Lingkungan dan Kinerja Keuangan (Studi Empiris pada Perusahaan yang Terdaftar di Bursa Efek Indonesia Sektor Manufaktur periode 2019-2021). *Owner Riset & Jurnal Akuntansi*, *7*(1), 774–786. https://doi.org/10.33395/owner.v7i1.1334

Rizki, A., Ningsih, S., Ekasari, W. F., Putri, F. V., Aini, S. N., & Nowland, J. (2024). The Impact of STEM CEO on Investment Efficiency: Evidence from Indonesia. *Cogent Business & Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2429800

Siregar, F. H., Syahyunan, & Miraza, Z. (2022). Kinerja Lingkungan, Biaya Lingkungan Dan Ukuran Perusahaan Terhadap Kinerja Keuangan Dengan Corporate Social Responsibility Sebagai Variabel Intervening. *Inovatif: Jurnal Ekonomi, Manajemen, Akuntansi, Bisnis Digital dan Kewirausahaan*, *1*(2), 187–205.

Sumarta, N. H., Prabowo, M. A., Amidjaya, P. G., Supriyono, E., & Prameswari, A. P. (2021). CEO Characteristics and Environmental Performance: Evidence from Indonesian Banks. *International Journal of Business and Society*, *22*(2), 1015–1033. https://doi.org/10.33736/ijbs.3779.2021

Suprapto, Y., Jolin, & Hesniati. (2024). Dampak Karakteristik Dewan Direksi Terhadap Kinerja

Perusahaan: Sektor Energi Bursa Efek Indonesia (BEI). *EVOLUSI : Jurnal Sains dan Manajemen*, *12*(2), 24–39. https://doi.org/10.31294/evolusi.v12i2.23061

Suryaningrum, R., & Ratnawati, J. (2024). Pengaruh Kinerja Lingkungan, Biaya Lingkungan, Kepemilikan Saham Publik, Green Accounting dan Struktur Modal Terhadap Kinerja Keuangan. *Jurnal Ilmiah MEA (Manajemen, Ekonomi, dan Akuntansi*, *8*(1), 1270–1292. https://doi.org/10.31955/mea.v8i1.3848

Tantri, M. R., Kusumaningtias, R., & Muthohhari, A. H. (2025). Pengaruh Pengungkapan Emisi Gas Rumah Kaca Terhadap Nilai Perusahaan dengan STEM CEO Sebagai Variabel Moderasi. *Jurnal Riset Akuntansi dan Keuangan*, *11*(1), 37–48.

Yanti, T. S., & Annisa, M. L. (2023). Analisis Hubungan Kinerja Lingkungan dan Ukuran Perusahaan Terhadap Kinerja Keuangan Perusahaan Farmasi. *MDP Student Conference*, *2*(2), 415–423. https://doi.org/10.35957/mdp-sc.v2i2.4523

Yuniarti, R., Sumarlan, A., Junaidi, A., & Riswandi, P. (2023). Peran Kinerja Lingkungan pada Pengaruh Gender Diversity terhadap Kinerja Keuangan. *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi dan Bisnis*, *11*(1), 713–722. https://doi.org/10.37676/ekombis.v11i1.3405

Yuniarti, Z. S. N., Ranidiah, F., Nurlaili, O., & Astuti, B. (2023). Pengaruh Penerapan Green Accounting, Corporate Social Responsibility, Kinerja Lingkungan Terhadap Kinerja Keuangan Perusahaan (Studi Empiris pada Perusahaan Sektor Pertambangan yang Terdaftar di Bursa Efek Indonesia Tahun 2019-2021). *Prosiding Seminar Nasional Ekonomi & Bisnis Akuntansi*, *3*, 1238–1248.

Zhang, C., Ma, Y., & Zhang, E. (2025). Does Green Innovation Promote Financial Performance of Chinese Listed Companies? *Journal of Innovation & Knowledge*, *10*. https://doi.org/10.1016/j.jik.2025.100740