Jurnal Akuntansi dan Ekonomika

Available at http://ejurnal.umri.ac.id/index.php/jae

Sustainability Practices and Financial Outcomes: Exploring the Role of Carbon Emission Disclosure

Praktik Keberlanjutan dan Hasil Keuangan: Menjelajahi Peran Pengungkapan Emisi Karbon

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Article Info

Article history:
Received: 21 Oktober 2025
Accepted: 31 Mei 2026
Published: 22 Juni 2026

Keywords: *media exposure; environmental performance; iso 14001 certification; social performance; carbon emission disclosure*

DOI: 10.37859/jae.v16i1.10383

JELClassification: Q56, Q51, M14, M41, G32

Abstrak

This research examines the factors and financial consequences of carbon emission disclosure in relation to company sustainability policies. It specifically investigates the degree to which media exposure, environmental performance, ISO 14001 certification, and social performance impact carbon emission disclosure, and how this disclosure subsequently influences firms' financial success. We used a quantitative study approach and secondary data from the annual and sustainability reports of manufacturing companies on the Indonesia Stock Exchange from 2019 to 2023. After applying the criterion for data completeness, 135 firm-year observations were included in the final sample. The data were examined with the PLS-SEM methodology. The findings indicate that carbon emission disclosure positively and significantly influences financial performance, whereas media exposure, environmental performance, ISO 14001 certification, and social performance exert no impact on carbon emission disclosure

Penelitian ini mengkaji faktor-faktor dan konsekuensi finansial dari pengungkapan emisi karbon dalam kaitannya dengan kebijakan keberlanjutan perusahaan. Secara khusus, penelitian ini menyelidiki sejauh mana paparan media, kinerja lingkungan, sertifikasi ISO 14001, dan kinerja sosial memengaruhi pengungkapan emisi karbon, dan bagaimana pengungkapan ini selanjutnya memengaruhi keberhasilan finansial perusahaan. Kami menggunakan pendekatan studi kuantitatif dan data sekunder dari laporan tahunan dan laporan keberlanjutan perusahaan manufaktur di Bursa Efek Indonesia dari tahun 2019 hingga 2023. Setelah menerapkan kriteria kelengkapan data, 135 observasi perusahaan-tahun dimasukkan dalam sampel akhir. Data dianalisis dengan metodologi PLS-SEM. Hasil penelitian menunjukkan bahwa pengungkapan emisi karbon secara positif dan signifikan memengaruhi kinerja keuangan, sedangkan paparan media, kinerja lingkungan, sertifikasi ISO 14001, dan kinerja sosial tidak berpengaruh pada pengungkapan emisi karbon.

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INTRODUCTION

Carbon emissions are a major global problem, and most people agree they are the main cause of the alarming, rapid pace of global warming. The 2023 International Climate Report says that human activities released about 40.6 billion tons of carbon dioxide, which is a 1.1% increase from the year before. During the same period, 45.1 billion tons of carbon dioxide were released worldwide, including emissions from land-use change. The Indonesian government has taken steps to reduce carbon emissions from industrial and development activities. But the government can't do it alone; it needs strong support from all parts of society, especially from businesses and industries[1]. Greenhouse gas emissions are a major driver of climate change and now a major problem for the whole world. Burning fossil fuels is the main cause of these emissions, which release carbon dioxide (CO_2) into the air. The World Energy Statistics say that in 2022, the energy sector was responsible for 43% of all CO_2 emissions, followed by the transportation sector at 25% and the industrial sector at 23%.

Based on Ferdiani & Mulyani (2023), business combines many ideas, such as public response, social responsibility, and policies for social response. Media exposure is crucial to strengthening the link between carbon emissions disclosure and a company's social performance. This is because it provides a place for people to share information and discuss corporate environmental initiatives. Companies are always trying to improve their environmental performance by using ISO 14001 standards in their environmental management systems. These standards encourage businesses to work together with the environment.

For example, creditors and shareholders who care about the environment rely on disclosures to make better investment decisions in the future. To make better investment decisions in the future, you need to be open and honest. Also, disclosing carbon emissions helps other groups, such as regulatory bodies, institutional investors, and the general public, by making carbon management more effective, informing strategies for reducing emissions, and enabling better monitoring and control processes to evaluate carbon-related opportunities. Improvements in managing carbon emissions can directly lead to better financial results for businesses (Siddique, Khan, & Khan, 2022).

This research is not the inaugural investigation into this subject, as various prior studies have already analyzed analogous themes. Numerous studies indicate that media exposure is positively affected by carbon emission disclosure (Sari & Sulfitri, 2023). However, Putri & Arieftiara, (2023) presented divergent findings, indicating that media exposure does not significantly influence carbon emission disclosure. Furthermore, studies conducted by Destiyuanita, Muid, & Sugiharto, (2022); Rahmawati, et al, (2024); Puteri & Inawati, (2023); Sari & Sulfitri, (2023); Setiawan & Iswati, (2019) indicate that environmental performance is positively affected by carbon emission disclosure. In contrast to these findings, Ratmono, Darsono, & Selviana, (2021) revealed that environmental performance has no significant influence on carbon emission disclosure. The findings of Setiawan & Iswati, (2019), indicate that carbon emission disclosure has a positive impact on ISO 14001 certification. However, a study by Sari & Sulfitri, (2023) found that carbon emission disclosure is not influenced by ISO 14001 certification. Based on Kristiani & Werastuti, (2020) and Ferdiani & Mulyani, (2023) concluded that social performance positively affects carbon emission disclosure. Furthermore, several additional studies including those by Kurniawan, Windari, & Rusmita, (2024) Lu, Zhu, & Zhang, (2021), Soewarno, Tjahjadi, & Firdausi, (2018) demonstrate that a company’s financial performance is positively influenced by carbon emission disclosure.

The legitimacy theory proposed by Dowling & Pfeffer, (1975) explains that companies strive to align their internal social values with the norms and ideals of the broader societal structure. To gain legitimacy, companies are required to report on their performance with respect to environmental and social aspects, as well as acknowledge the impact they have on the social and environmental surroundings (Brown & Deegan, 1998). Legitimacy theory posits that companies strive to obtain and maintain public legitimacy by aligning their operations with prevailing social norms and expectations. Media exposure is viewed as a mechanism that amplifies public pressure and social expectations on corporations. The more attention the media pays to a company, the more it wants to be honest about its environmental impact. Sari & Sulfitri, (2023) research found that media exposure has a positive effect on carbon emission disclosure.

H_1: Exposure to media has a beneficial impact on the disclosure of carbon emissions.

According to legitimacy theory, a company's environmental performance reflects how well it adheres to environmental regulations to gain and maintain social legitimacy. In this context, Amaliyah & Solikhah (2019) underscore that companies must proficiently manage their environmental performance and disclose pertinent information in their reports to attain public legitimacy. Furthermore, studies conducted by Rahmawati et al (2024); Destiyuanita, Muid, & Sugiharto (2022); Puteri & Inawati (2023), Sari & Sulfitri (2023); Setiawan & Iswati (2019) demonstrate that environmental performance positively affects carbon emission disclosure.

H_2: Environmental performance positively influences carbon emission disclosure.

Legitimacy theory posits that ISO 14001 certification encompasses initiatives to address climate change (Setiawan & Iswati, 2019). Legitimacy theory posits that companies gain societal acceptance and are deemed legitimate when they demonstrate that their operations conform to prevailing social values and expectations, including environmental responsibilities. The findings of Setiawan & Iswati, (2019) found that ISO 14001 certification has a positive effect on carbon emission disclosure.

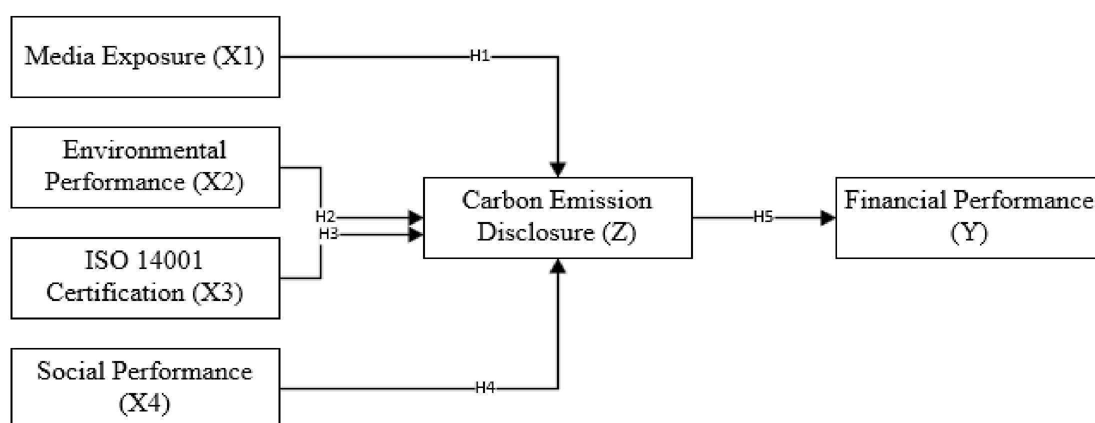
H_3: Getting ISO 14001 certification makes it easier to report on carbon emissions.

Stakeholder theory is another way to look at social performance. It says businesses should consider the needs and wants of different stakeholder groups. As companies provide more detailed information about their social programs, it is likely that carbon emissions disclosure will increase. Based on Ferdiani & Mulyani (2023) and Kristiani & Werastuti (2020) concluded that social performance positively affects carbon emission disclosure.

H_4: Social performance positively influences carbon emission disclosure.

Stakeholders have played a big role in making businesses more sustainable, so the main goal of stakeholder theory is to make things better for them. To ensure organizations receive full support and achieve their goals, they need to manage their stakeholders effectively. Environmental reporting is very important for stopping things that could hurt the company (Hanifah & Wahyono, 2018). According to stakeholder theory, being open about carbon emissions can help build trust with customers, investors, and the public. This trust, in turn, makes it easier to get loans, keeps clients coming back, and improves the company's reputation. Studies conducted by Lu, Zhu, & Zhang, (2021), Kurniawan, Windari, & Rusmita, (2024) and Soewarno, Tjahjadi, & Firdausi, (2018) indicate that carbon emission disclosure positively affects a company's financial performance.

H_5: Disclosing carbon emissions has a good effect on financial performance.



Source: Processed by the researcher, 2025

Figure 1. Research Model

This study aims to investigate the factors and financial consequences of carbon emission disclosure in relation to corporate sustainability practices. It specifically examines whether media exposure, environmental performance, ISO 14001 certification, and social performance positively affect the level of carbon emissions reported. The study also looks at whether better carbon emission reporting helps companies make more money. By examining these relationships, the research seeks to enhance comprehension of how sustainability initiatives and transparency in environmental reporting can influence both environmental responsibility and financial results.

METHODOLOGY

This quantitative analysis employs secondary data from manufacturing firms listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. The criteria for the sample include companies that have published annual financial reports and sustainability reports in a row and use the Indonesian Rupiah as their reporting currency. The study analyzes six variables: media exposure, environmental performance, ISO 14001 certification, and social performance as independent variables; carbon emission disclosure as a mediating variable; and financial performance as the dependent variable affected by carbon emission disclosure.

To facilitate the analysis, each variable was assessed utilizing methods suited to its specific attributes. Sustainability reports, annual reports, and companies' official websites were used to obtain information on media exposure (Nurjanah & Herawaty, 2022). A dummy variable methodology was employed to assess ISO 14001 Certification (Maqfirah & Fahrianta, 2022). The Global Reporting Initiative (GRI) Standards 2021 were used to assess social performance (Orlitzky, 2001). We used a carbon emission checklist made by Firmansyah, et al, (2021) to measure carbon emission disclosure (CED) and the Return on Assets (ROA) indicator by Rahmawati, et al, (2024) to measure financial performance.

The researcher first used Microsoft Excel to process the first set of data they collected. After the validation process was completed, Smart PLS version 4.1.2 was used to analyze the data. Furthermore, a descriptive analysis was performed, including calculations of the mean, median, mode, and standard deviation to delineate the primary characteristics of the variables identified in the annual and sustainability reports. Path analysis using the Partial Least Squares (PLS) technique was conducted to determine whether the research hypotheses were accepted or rejected. A hypothesis was deemed accepted if the p-value was below 0.05.

In this study, validity and reliability testing was conducted through the evaluation of the inner model using the R-square value, without involving outer model testing. This approach was taken because outer model testing is only applicable when latent variables have more than one indicator. Data processing was carried out using Smart-PLS, where R-square values ranging from > 0.25 to 0.75 are categorized as moderate, indicating that the model has a reasonable explanatory power for the dependent variable (Hair, et al, 2014).

RESULT AND DISCUSSION

Of 50 samples obtained from the official websites of companies and the Indonesia Stock Exchange (IDX), 27 companies met the criteria and had complete data required for this study. These 27 manufacturing companies consistently published both annual and sustainability reports from 2019 to 2023.

Table 1. Descriptive Statistics

	Mean	Median	Minimum	Maximum	Standard Deviation
X1	4.564	4.330	3.000	5.000	0.480
X2	3.296	3.000	2.400	4.600	0.574
X3	0.681	1.000	0.000	1.000	0.390
X4	2.337	2.360	0.950	3.610	0.627
Z	3.399	3.390	1.280	5.000	0.839
Y	4.366	3.600	-25.490	31.240	11.116

Source: Processed by the researchers, 2025.

The results of the descriptive statistical analysis show that the media exposure variable has an average value of 4.564, with low dispersion, indicating that most of the data is concentrated at the upper end of the scale. The environmental performance variable had a mean of 3.296, and the data was mostly evenly spread around the midpoint. The average value of 0.681 for the ISO 14001 certification variable indicates that most companies in the sample have this certification, given that the variable is binary. The social performance variable also has a mean of 2.337 and a moderate range, indicating that the data are still close to the average. The average for the carbon emissions disclosure variable is 3.399, indicating that, despite some variation, the data remains within a reasonable range. The

dependent variable, financial performance, has a mean value of 4.366. The large range of data shows that there are likely big changes and outliers, which should be investigated further in the next analysis.

Table 2. R-Square Test Result

	R-Square	Adj. R-Square
Carbon Emission Disclosure	0,339	0,219
Financial Performance	0,047	0,009

Source: Processed by the researchers, 2025.

The findings indicate that the mediating variable, carbon emission disclosure, is elucidated by the independent variables at a rate of 33.9%, with the residual 66.1% ascribed to extraneous factors beyond the model. The dependent variable, financial performance, has a lower R-square value of 4.7%. This means that about 95.3% of its variation is due to things that weren't studied. Carbon emission disclosure exhibits superior predictive capability relative to financial performance, indicating that it represents a larger share of the variance than the financial performance variable.

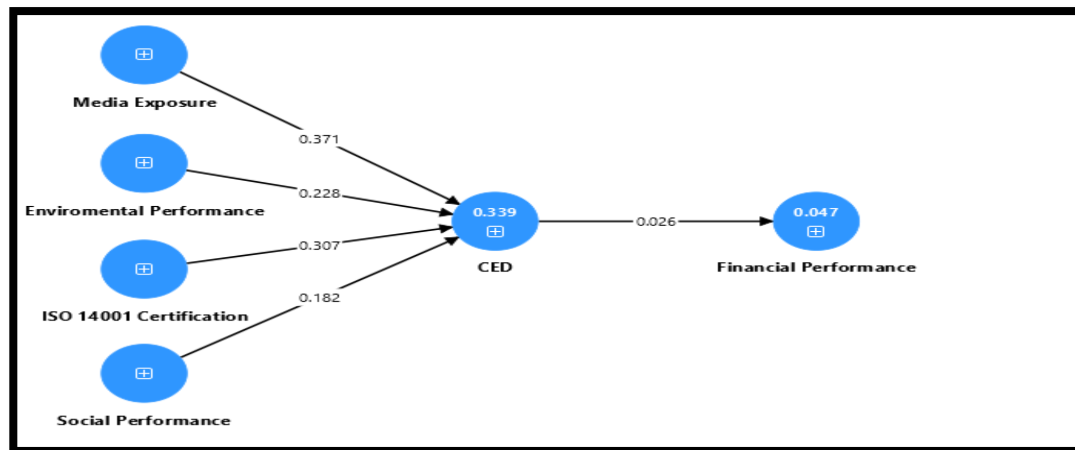
Table 3. Hypothesis Test Result

	Original Sample	P Value	Result
Media Exposure ➞CED	0,236	0,371	Rejected
Environmental Performance ➞CED	0,22	0,228	Rejected
ISO 14001 ➞CED	0,249	0,307	Rejected
Social Performance	0,263	0,182	Rejected
CED ➞Financial Performance	0,217	0,026	Accepted

Source: Processed by the researchers, 2025.

We used the Smart-PLS program to test the five hypotheses in this study using a bootstrapping method. The test results showed that there was no strong link between media exposure and carbon emission disclosure. The original sample value was 0.236, and the p-value was 0.371. The hypothesis is rejected because the p-value is greater than 0.05. Moreover, environmental performance had no significant impact on carbon emissions disclosure, as evidenced by a p-value of 0.228 and an initial sample value of 0.220. This means that a company doesn't have to do better for the environment to get more carbon emissions information.

The original sample value for the ISO 14001 certification variable was 0.249, and the p-value was 0.307. This finding indicates that ISO 14001 accreditation exerts a negligible influence on carbon emission disclosure. The social performance variable also had a p-value of 0.182 and an original sample value of 0.263. Even though there was a positive relationship, the hypothesis was not accepted because the p-value was greater than 0.05, which meant that the effect was not statistically significant. The correlation between financial performance and carbon emission disclosure produced disparate outcomes. The p-value of 0.026 and the original sample value of 0.217 show that carbon emission disclosure has a big effect on a company's financial performance. Consequently, this hypothesis is affirmed.



Source: Processed by the researcher, 2025

Figure 2. Bootstrapping Test Result

Discussion

The initial hypothesis regarding the impact of media exposure on carbon emissions disclosure is not supported, as evidenced by a P-value of 0.371, which substantially exceeds the 0.05 threshold. This indicates that there is no statistically significant relationship between the two variables. In theory, media exposure can pressure companies to be more transparent about environmental information (Deegan, 2002). Media pressure, on the other hand, isn't always direct or focused on environmental issues. It can also draw attention to broader aspects of a company, such as its financial performance or overall reputation (Brown & Deegan, 1998). This situation might be why media coverage isn't strong enough to prompt companies to voluntarily report their carbon emissions. These results align with the findings of Putri & Arieftiara, (2023), who similarly determined that media exposure exerts no significant impact on carbon emission disclosure.

The second hypothesis, with a P-value of 0.228, posits that environmental performance does not substantially affect carbon emission disclosure. To gain legitimacy or social acceptance, companies often try to align with social values and public expectations (Suchman, 1995). Though, companies usually want to be seen as legitimate by following formal rules or standards, like PROPER, without having to share detailed information about their carbon emissions (Cho, et al, 2015). Companies with high PROPER ratings may be good for the environment, but carbon emission disclosure is not a big part of PROPER evaluations. The program is more about general things like managing waste, water, and energy. Companies may therefore put more effort into making their operations more environmentally friendly without having to publicly report their carbon emissions (Cho, et al, 2015). This finding is corroborated by Ratmono, Darsono, & Selviana, (2021), who determined that carbon emission disclosure is not significantly influenced by environmental performance.

The third hypothesis test shows that ISO 14001 certification does not have a statistically significant effect on carbon emission disclosure. This is because the p-value of 0.307 is higher than the 0.05 significance threshold. This means that the hypothesis is not true. The rejection indicates that having ISO 14001 certification does not ensure greater openness in reporting carbon emissions. One possible reason is that ISO 14001 is more about internal environmental management systems than it is about public reporting (Cho, et al, 2015). This finding is corroborated by research conducted by Sari & Sulfitri, (2023) and Purnayudha & Hadiprajitno, (2022), which asserted that carbon emission disclosure is unaffected by ISO 14001 accreditation.

The fourth hypothesis posits that there is no correlation between social performance and carbon emissions disclosure. A P-value of 0.182 backs this up, showing that a company can have good social performance but that doesn't mean the hypothesis is true. Stakeholder theory posits that corporations must be accountable not solely to shareholders but also to various stakeholders, including society, the government, and the environment (Freeman, 2010). Nonetheless, this absence of impact may arise from the fact that corporate social responsibility initiatives are not directly associated with

carbon emission disclosure, which largely remains voluntary. This result aligns with Gunawan & Gunawan, (2023), who determined that social performance does not affect carbon emission disclosure.

The fifth hypothesis confirms the impact of carbon emission disclosure on financial performance. A P-value of 0.026, which is less than 0.05, backs this up. This means that the relationship is statistically significant. This finding supports the idea that stakeholders such as investors, consumers, and regulators tend to favor companies that demonstrate they care about the environment, especially when they are transparent about their carbon emissions. These kinds of responses can lead to more loyal customers, greater investor trust, and support from regulators, all of which can enhance a company's reputation, make it easier to obtain loans, and improve its overall financial performance (Fernando & Lawrence, 2014). These findings align with earlier research conducted by Kurniawan, Windari, & Rusmita, (2024) and Soewarno, Tjahjadi, & Firdausi, (2018), both of which identified a positive correlation between carbon emission disclosure and financial performance.

CONCLUSION

The findings of this study indicate that of the five proposed hypotheses, only the correlation between carbon emission disclosure and financial performance is statistically validated, suggesting that increased disclosure positively influences a company's financial results. This result shows that being more transparent about carbon emissions can improve financial performance, especially for manufacturing companies that have a significant impact on the environment. Conversely, media exposure, environmental performance, ISO 14001 certification, and social performance exhibited no significant impact on carbon emission disclosure. This study faced limitations due to the small sample size and the challenge of acquiring complete sustainability reports, as not all companies consistently provided comprehensive sustainability information during the observation period. These limitations may have affected the strength and accuracy of the results.

SUGGESTION

Future researchers should expand the scope of their studies by addressing the limitations identified in this research, particularly regarding sample size and observation duration. Increasing the sample size can enhance the study's statistical validity and yield results that more accurately reflect Indonesian corporations, particularly in the manufacturing sector and other industries with significant carbon emissions. Furthermore, extending the research duration is imperative to monitor the changing trends in corporate environmental disclosure practices, along with companies' adaptive responses to regulatory changes and external pressures.

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