

REVERSING THE IMPACT: HOW ENVIRONMENTAL TRANSFORMS EARNINGS MANAGEMENT, FINANCIAL DISTRESS, AND CARBON EMISSIONS INTO VALUE DRIVERS

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ABSTRACT

This study examines the effect of earnings management, financial distress, and carbon emissions on firm value, as well as the moderating role of environmental disclosure. The population consists of energy and basic materials sector companies listed on the Indonesia Stock Exchange. Using purposive sampling, resulting in 232 firm-year observations. The sampling criteria include companies with complete annual and sustainability reports prepared under the Global Reporting Initiative (GRI) standards and those disclosing carbon emission data. Data were collected from company websites and the IDX website. The analysis employed a Random Effect Model (REM) after confirming the absence of multicollinearity. The results show that earnings management and carbon emissions have no effect on firm value, while financial distress negatively affects firm value. Furthermore, environmental disclosure weakens the negative effect of earnings management and financial distress on firm value, but it cannot moderate the relationship between carbon emissions and firm value. Overall, the findings indicate that environmental disclosure plays a moderating role, suggesting that transparent environmental practices can enhance corporate credibility and help reduce the adverse impacts of financial or managerial factors on firm value.

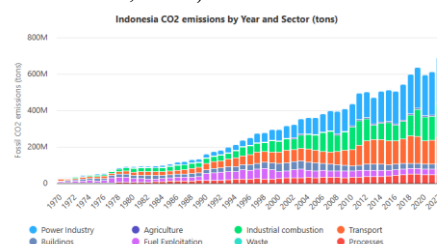
Key words: earnings management, financial distress, carbon emissions, environmental disclosure, firm value

INTRODUCTION

Firm value reflects the market's overall assessment of a company's performance and future prospects, serving as a key indicator of managerial efficiency in generating returns and maintaining investor confidence (Busch et al., 2020; Suwarno et al., 2021). It demonstrates how effectively management converts financial resources into market appreciation (Vaicondam et al., 2024). When liquidity, profitability, and leverage ratios are favorable, investors respond with higher valuations and stock prices (Busch et al., 2020). Hence, financial management aims to maximize market-based firm value through strategic and ethical decisions that enhance shareholder wealth and corporate reputation (Vaicondam et al., 2024).

In Indonesia, earnings management has increasingly been recognized as a key driver of financial distress and declining firm value. The eFishery case exposed alleged profit inflation of USD 600 million (IDR 9.74 trillion) within nine months ending September 2024, as the firm reported a USD 16 million profit despite an internal loss of USD 35.4 million and overstated revenues from USD 157 million to USD 752 million (Syafei & Assifa, 2025). Similarly, PT Sri Rejeki Isman Tbk (Sritex) suffered severe financial distress after years of aggressive reporting and poor debt management, shifting from a USD 85 million profit in 2020 to a USD 1.08 billion loss in 2021, with liabilities rising to IDR 24.5 trillion by 2024 (Setiawati, 2025). The revelation of irregular credit approvals worth IDR 3.58 trillion further exposed governance failures (Setiawati, 2025). These cases show how unethical financial reporting distorts performance, triggers distress, and destroys investor confidence in firm value.

Earnings management harms a firm's actual financial performance, misleading impressions to decline investor confidence and firm value (Simamora et al., 2022; Bouaziz et al., 2020). When managers manipulate earnings to achieve short-term goals, transparency declines and market trust declines, weakening firm valuation (Chakroun et al., 2021; Suwarno et al., 2021). Such opportunistic behavior damages the credibility of financial information and stakeholder relationships for long-term stability (Chakroun et al., 2021; Craig Deegan, 2023). Likewise, financial distress signals a firm's reduced capacity to meet obligations, sending negative signals that diminish investor confidence and market value (Muslih & Pratiwi, 2023; Vo, 2023). Consequently, both earnings management and financial distress jointly reduce firm value by undermining transparency, stakeholder trust, and perceived financial resilience (Hirman et al., 2025; L. Wu et al., 2020).



Source: Worldometer (2022)

Figure 1. Indonesia's CO₂ Emissions Across Sectors (1970–2022)

The discussion of firm value has increasingly expanded from financial to include environmental performance. As shown in Figure 1, Indonesia's CO₂ emissions have risen sharply from 1970 to 2022, driven mainly by the power industry in the first place. This continuous increase reflects the growing dependence on fossil fuels and highlights the environmental cost of industrial and economic expansion. Firms with high carbon emissions face greater environmental risks that can reduce investor confidence and weaken firm value, as markets increasingly favor companies demonstrating responsible and sustainable practices (Basse Mama & Mandaroux, 2022). Since the implementation of the Kyoto Protocol in 2005, carbon emissions have become a benchmark of firm environmental responsibility, influencing both regulatory exposure and investment decisions (Benkraiem et al., 2022). Consequently, firms that fail to manage their carbon footprint effectively are likely to face declining investor trust, reputational damage, and a subsequent decrease in firm value (Bobae Choi et al., 2020).

Empirical studies reveal inconsistent findings on the relationship between earnings management, financial distress, carbon emissions, and firm value. Some argue that earnings management enhances firm value (Boachie & Mensah, 2022; Dewi & Wijaya, 2021; Huu et al., 2025), while others don't (Simamora et al., 2022; Bouaziz et al., 2020; Suwarno et al., 2021). Similar contradictions appear in carbon emission studies, with some linking higher emissions to production strength (Benkraiem et al., 2022; Han et al., 2023), while others otherwise (B. Choi & Luo, 2021; Probahudono et al., 2024). Also on financial distress studies, as a few highlight restructuring benefits, while most find it decreases firm value (Hirman et al., 2025; Vo, 2023). These inconsistencies underscore a gap in understanding how financial and environmental factors interact to influence firm value.

This study contributes novelty by examining environmental disclosure as a moderating variable in the relationship between earnings management, financial distress, carbon emissions, and firm value. Although prior studies highlight environmental performance as a determinant of firm value, few have explored the moderating role of disclosure (Chang & Lee, 2022; S. Wu et al., 2022). Environmental disclosure improves transparency and allows investors to assess a firm's accountability and stability (Yu & Xiao, 2022). Firms with greater disclosure are viewed as more credible, reducing financing pressure and mitigating negative managerial or financial effects (S. Wu et al., 2022). Therefore, this study fills a research gap by emphasizing that transparent environmental reporting helps sustain firm value amid financial and environmental risks.

Agency theory suggests that managers may manipulate earnings for personal gain, creating information asymmetry that misleads investors and harms long-term value (Zimon et al., 2021). Although such actions may signal short-term profitability, the market tends to discount them once detected. Prior studies show that accrual and real earnings management have minimal impact on future cash flows and firm value (Dedman & Bi, 2025). Therefore, earnings management is expected to negatively affect firm value.

H1: Earnings management negatively affects firm value

Financial distress indicates a firm's inability to meet its financial obligations, signaling instability and heightened bankruptcy risk (Bandanuji & Khoiruddin, 2020; Vo, 2023). From a signaling perspective, such conditions send negative signals to investors, reducing confidence and market perception. Empirical evidence shows that prolonged distress weakens profitability and undermines firm performance (Hirman et al., 2025). Therefore, financial distress is expected to negatively affect firm value.

H2: Financial distress negatively affects firm value.

High carbon emissions indicate potential regulatory, operational, and reputational risks that reduce investor confidence (Caragnano et al., 2020). Conversely, firms with low emissions signal responsibility and operational efficiency (Bobae Choi et al., 2020; Probahudono et al., 2024). In markets prioritizing sustainability, high emission intensity can diminish firm value. Hence, carbon emissions are expected to negatively affect firm value.

H3: Carbon emissions negatively affect firm value

Environmental disclosure reduces information asymmetry and serves as a credible signal of corporate accountability (Melinda & Wardhani, 2020; Yang et al., 2020). Transparent reporting strengthens investor trust by demonstrating sound governance and long-term commitment, thereby lessening the negative impact of earnings management and financial distress (P. & Busru, 2021). However, disclosure may not completely counter investor concerns about high carbon emissions, which remain associated with environmental and regulatory risks (Bobae Choi et al., 2020). Therefore, environmental disclosure is expected to weaken the negative effects of earnings management and financial distress, but only partially moderate the relationship between carbon emissions and firm value.

H4: Environmental disclosure weakens the negative effect between earnings management and firm value.

H5: Environmental disclosure weakens the negative effect between financial distress and firm value.

H6: Environmental disclosure weakens the negative effect between carbon emissions and firm value.

METHOD

This study adopts a quantitative design to examine the effects of earnings management, financial distress, and carbon emissions on firm value, with environmental disclosure as a moderating variable. The sample includes energy and basic materials companies listed on the Indonesia Stock Exchange, totaling 232 firm-year observations selected through purposive sampling. Data were obtained from annual and sustainability reports compliant with

GRI standards. Firm value is measured using Tobin's Q, reflecting market expectations and investment efficiency (Benkraiem et al., 2022). Earnings management is measured using the Kothari model to minimize estimation bias (Haugland Sundkvist et al., 2023), and financial distress using the Zmijewski model based on ROA, debt ratio, and current ratio (Hirman et al., 2025). Carbon emissions are measured as total emissions over total revenue (Han et al., 2023; Lee & Cho, 2021), and environmental disclosure as the ratio of disclosed indicators to the total GRI index (Angela & Sari, 2023). Firm size (ln total assets) and debt-to-asset ratio (DAR) serve as control variables (Chang & Lee, 2022; L. Wu et al., 2020). Data were analyzed using the Random Effect Model (REM) in STATA after confirming the absence of multicollinearity.

RESULTS AND DISCUSSION

The regression results before moderation show that earnings management (EM) negatively but insignificantly affects firm value (Coef. = -0.1837, $p = 0.537$), leading to the rejection of H1. This suggests that although managers may manipulate earnings to signal short-term profitability, such behavior—consistent with agency theory—fails to enhance shareholder value, as investors can identify and discount opportunistic reporting (Dedman & Bi, 2025; Zimon et al., 2021). Financial distress (FD) has a significant negative impact on firm value (Coef. = -0.9376, $p < 0.001$), supporting H2, as persistent financial pressure signals instability and increases bankruptcy risk, aligning with signaling theory's view that poor financial health weakens investor confidence (Muslih & Pratiwi, 2023; Vo, 2023). Firms with high leverage are perceived as less capable of sustaining profitability, amplifying perceived risk (Hirman et al., 2025). Meanwhile, carbon emissions (CE) show a negative but insignificant effect on firm value (Coef. = -24,804.28, $p = 0.633$), leading to the rejection of H3, as investors in Indonesia still prioritize operational performance and production capacity over environmental concerns (Lee & Cho, 2021; Vaicondam et al., 2024).

Table 1. Regression Analysis

Explanatory Variables	Before Moderation		After Moderation	
	Coef.	p value	Coef.	p value
Earnings Management (EM)	-0.1836942	0.537	-5.968191	0.008*
Financial Distress (FD)	-0.9375886	<0.001**	-1.614282	<0.001**
Carbon Emissions (CE)	-24804.28	0.633	-118720.8	0.134
Environmental Disclosure (ED)			0.4898512	0.368
EM x ED			9.175524	0.009*
FD x ED			0.8105702	<0.001**
CE x ED			176107.4	0.196
DAR (<i>control</i>)	6.342043	<0.001**	9.005111	<0.001**
Firm Size (<i>control</i>)	-0.8869923	0.837	0.1246941	0.394
Adjusted R ²		0.9854		0.9880

*Notes for significance level * $p < 0.05$, ** $p < 0.001$*

Source: Data proceed

After incorporating environmental disclosure (ED) as a moderating variable, the results show that transparency significantly influences the relationships between the main variables and firm value. Earnings management (EM) becomes significantly negative (Coef. = -5.9682, $p = 0.008$), consistent with agency theory, which posits that opportunistic managerial behavior reduces shareholder value through information asymmetry. However, the interaction between EM and ED (Coef. = 9.1755, $p = 0.009$) reveals that disclosure weakens this negative effect, confirming H4 and aligning with signaling theory, where transparent reporting serves as a credible signal that enhances investor confidence (Hirman et al., 2025). Financial distress (FD) maintains a significant negative effect on firm value (Coef. = -1.6143, $p < 0.001$), while its interaction with ED (Coef. = 0.8106, $p < 0.001$) supports H5, suggesting that disclosure mitigates the adverse perception of financial risk by signaling strong governance and commitment to sustainability. In contrast, carbon emissions (CE) remain negative but insignificant (Coef. = -118,720.8, $p = 0.134$), and the moderating effect of ED (Coef. = 176,107.4, $p = 0.196$) is also insignificant, leading to the rejection of H6. Overall, the adjusted R² increases from 0.9854 to 0.9880, suggesting that environmental disclosure improves model reliability and highlights its importance in decreasing information gaps and strengthening corporate legitimacy.

CONCLUSION

This study concludes that financial and environmental factors jointly influence firm value in Indonesia's energy and basic materials sectors. Earnings management and carbon emissions do not directly affect firm value, while financial distress negatively impacts it, reflecting the market's sensitivity to financial instability. The inclusion of environmental disclosure reveals its moderating role, as transparency in reporting weakens the negative effects of earnings management and financial distress, though it cannot offset the impact of carbon emissions. These findings

suggest that firms emphasizing environmental accountability and clear sustainability communication are better positioned to preserve value amid financial challenges. Future research may extend this model by exploring other ESG dimensions or industry contexts to further validate the moderating role of disclosure in enhancing long-term corporate value.

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