

DETERMINANTS OF SUSTAINABLE FINANCIAL PERFORMANCE: EXAMINING THE MEDIATING ROLES OF ENTERPRISE RISK MANAGEMENT AND GREEN INTELLECTUAL CAPITAL INDEX

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Abstract

The transition to sustainable industrial practices presents challenges to financial performance, while empirical evidence on the financial benefits of corporate environmental responsibility remains inconclusive. This study examines the determinants of sustainable financial performance by investigating the mediating roles of Enterprise Risk Management (ERM) and the Green Intellectual Capital Index (GICI). Using a quantitative approach, data were collected from companies in the basic materials, healthcare, and industrial sectors listed between 2022 and 2024 and analyzed using Structural Equation Modeling (SEM) with SmartPLS. The findings reveal that green accounting and environmental performance positively influence ERM, while ERM and GICI positively affect financial performance. Both ERM and GICI mediate the relationship between green accounting, environmental performance, and financial performance. However, green accounting does not significantly influence GICI. These findings suggest that environmental initiatives enhance financial performance when supported by effective risk management and green intellectual capital, highlighting the importance of integrating sustainability practices with organizational capabilities.

Keywords: *Green Accounting; Environmental Performance; Enterprise Risk Management; Green Intellectual Capital Index; Financial Performance.*

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1. INTRODUCTION

In the era of the global green economy transition, Indonesian companies face dual pressure to align profitability with environmental responsibility, as mandated by regulatory frameworks such as Government Regulation No. 22 of 2021 concerning the Implementation of Environmental Protection and Management. Despite widely adopted commitments to Net Zero Emissions and the Triple Bottom Line principle, the implementation of green accounting and environmental performance in sustainability reports often becomes merely an administrative burden or a formality (greenwashing).

The Indonesian government also continues to strive to improve environmental governance through various performance indicators, despite facing significant ecological challenges. At the World Summit, President Joko Widodo addressed climate change, or COP26. He explained that Indonesia's abundant natural resources must contribute to climate change mitigation. Indonesia has also begun rehabilitating 600,000 hectares of mangrove forests by 2024 and has rehabilitated 3,000,000 hectares of degraded land between 2010 and 2019. This allows Indonesia to contribute to global net-zero emissions. To achieve this, Indonesia has initiated participation in carbon markets and carbon pricing to address climate change (President of the Republic of Indonesia, 2021).

To support sustainable industrial development, the government has also enacted regulations. Government regulations require industrial practices to be environmentally conscious and friendly, thus implementing ecological efficiency in their industrial practices. In this regard, every company is expected to implement sustainability accounting (sustainability reporting) to disclose the company's condition in terms of environmental awareness.

Therefore, this study will discuss sustainable accounting in more detail and improve understanding of the determinants of sustainable financial performance. Although instruments such as green accounting and sustainability reporting have begun to be adopted to demonstrate corporate environmental transparency, their impact on financial performance often shows contradictory results in the accounting literature. Some management still views environmental expenditures as a cost burden that reduces short-term profitability. Therefore, a deeper understanding of moderating variables that can transform environmental responsibility into a competitive advantage is urgently needed. This study proposes Enterprise Risk Management (ERM) as a mediator because comprehensive risk management can mitigate the financial impact of environmental uncertainty. Furthermore, the Green Intellectual Capital Index is proposed as a moderating variable.

In an effort to fill this research gap, it is emphasized that high-quality sustainability disclosure acts as an information bridge that strengthens the relationship between a company's operational and financial performance. This signal is expected to increase investor confidence and impact the bank's financial performance, which is represented by Return on Assets (ROA). The main objectives of this paper are (i) to empirically test green accounting and environmental performance on corporate risk management, (ii) to

empirically test corporate risk management and green intellectual capital index on financial performance, (iii) to empirically test corporate risk management mediates the relationship between green accounting and environmental performance on financial performance, (iv) to empirically test green intellectual capital index mediates green accounting and environmental performance on financial performance. Meanwhile, the research questions in this paper are (i) do green accounting and environmental performance affect financial performance? (ii) Do corporate risk management and green intellectual capital index affect financial performance? (iii) Does corporate risk management mediate the relationship between green accounting and environmental performance on financial performance? (iv) Does the green intellectual capital index mediate the relationship between green accounting and environmental performance on financial performance? This paper focuses on the role of green accounting, environmental performance, corporate risk management, and the green intellectual capital index in improving financial performance.

2. LITERATURE REVIEW

Contingency Theory

According to Outley (1980), contingency theory is a theory of leadership fit, meaning that leaders adapt to the conditions that are right for the company. Contingency theory can be used to analyze management accounting design and systems to provide information that companies can use for various purposes and to face competition. Research conducted by Merchant (1982) states that there is no universally appropriate control system that can be applied to all organizations in all circumstances. Control systems will vary in each organization based on organizational and situational factors. This is supported by research conducted by Fisher (1998), which states that control is the central idea of scientific management.

Agency Theory

Agency theory explains the conflict of interests that occurs between the holder of economic power (principal) and the manager (agent) as the party who controls the existing power. This conflict between the two parties is the cause and effect of information asymmetry. To reduce agency conflicts, disclosure should be increased so that it can provide intuitive contributions to aligning the interests of managers and shareholders (Jenson & Meckling, 1976).

Stakeholder Theory

Stakeholder Theory, popularized by Fisher (1998), states that an organization is not merely an entity operating for its own benefit or simply maximizing shareholder wealth. This theory assumes that a company's long-term existence and success depend heavily on harmonious relationships with parties that influence or are influenced by its activities.

In a managerial context, this theory emphasizes the importance of integrating these diverse interests into business strategy to build social legitimacy, mitigate risk, and create sustainable competitive advantage through the creation of shared value.

Signaling Theory

Signaling Theory, first developed by Michael Spence (1973), explains how companies provide information or "signals" to reduce information asymmetry between management (internal) and external parties (external) such as investors or creditors. In the context of financial management and accounting, this theory argues that managers have more accurate information than external parties, thus encouraging companies to provide positive signals through credible disclosures. These signals serve to provide market confidence in the organization's performance and stability, which is expected to influence market perceptions, increase company value, and attract investor interest.

Resource-Based View (RBV)

The Resource-Based View (RBV), comprehensively developed by Wernerfelt. (1984), argues that a company's sustainable competitive advantage is determined by the ownership and control of its internal strategic resources. This theory views organizations as a heterogeneous collection of resources and capabilities, where organizational success depends not only on external industry conditions but also on the company's ability to manage assets that meet the VRIN criteria: valuable, rare, inimitable, and non-substitutable.

Trade-off Theory

According to Kraus and Litzenberger (1973), the trade-off theory of capital structure assumes that companies determine optimal debt levels by balancing the benefits and costs of using debt. According to this theory, using debt provides the benefit of tax savings (a tax shield) due to deductible interest expenses from taxable income; however, increasing debt also increases the risk and potential costs of bankruptcy (financial distress costs) and agency costs. Therefore, companies following a trade-off pattern will continue to increase debt until the marginal value of the tax shield equals the marginal cost of potential financial distress. The implementation of this theory shows that each company has a different target capital structure, influenced by its business risk profile and cash flow stability.

Hypothesis Development

Green Accounting for Enterprise Risk Management

The implementation of Green Accounting demonstrates transparency in identifying, measuring, and reporting the costs and environmental impacts arising from its operational activities. Consistent with previous research by Sari, R.N., (2020), providing accurate environmental data through green accounting provides a strong information foundation for management to more comprehensively map uncertainties. The

availability of this environmentally based information directly strengthens the Enterprise Risk Management (ERM) framework for detecting and managing non-financial risks. By integrating environmental costs into internal reporting, companies can balance compliance costs with the benefits of proactive risk management. This enables organizations to better control potential operational and strategic losses related to sustainability issues. Through systematic documentation of environmental impacts, companies not only fulfill their ethical responsibilities but also enhance their ERM maturity in creating organizational value that is resilient to climate change and the dynamics of green regulations. Therefore, the following hypothesis can be formulated based on theoretical explanations and previous research findings:

H1: Green Accounting Has a Positive Impact on Enterprise Risk Management.

Enterprise Risk Management on Financial Performance

The implementation of Enterprise Risk Management (ERM) serves as a control mechanism to align the interests of managers (agents) and shareholders (principals), in accordance with the assumptions of Agency Theory. In agency relationships, information asymmetry often occurs, where managers tend to engage in self-serving behavior or avoid risks that can actually hinder company growth. With an integrated ERM framework, management is forced to act transparently in managing corporate risk, thereby reducing agency costs arising from ineffective oversight. Consistent with previous research by Hoyt & Liebenberg (2024), centralized and systematic risk management can minimize profit volatility and prevent wasted resources on high-risk but unprofitable projects. Therefore, the following hypothesis can be formed based on theoretical explanations and previous research findings:

H2: Enterprise Risk Management has a positive effect on Financial Performance.

Green Accounting and the Green Intellectual Capital Index

The implementation of Green Accounting is not simply a reporting tool, but rather a strategic instrument whose effectiveness depends on the alignment of internal information systems with the demands of the company's external environment. Based on Contingency Theory, an organization's success in transforming environmental data into strategic assets is determined by management's ability to respond to situational pressures, such as government regulations and green market awareness. Green accounting provides relevant data on environmental costs, savings, and investments, which then serve as the raw material for developing the Green Intellectual Capital Index (GICI). Companies that contingently adapt their green accounting practices to innovation needs will be more effective in building environmentally based intellectual capital, both in the form of employee knowledge (green human capital) and internal processes (green structural capital). Therefore, the following hypothesis can be formed based on theoretical explanations and previous research findings:

H3: Green Accounting Has a Positive Effect on the Green Intellectual Capital Index.

Green Intellectual Capital Index on Financial Performance

The application of the Green Intellectual Capital Index (GICI), which encompasses green human, structural, and relational capital, is believed to be able to drive competitive advantage, leading to improved financial performance. Based on Contingency Theory, the effectiveness of these environmentally based intangible assets in generating profits depends heavily on the alignment between a company's internal capabilities and the dynamics of the existing business environment. In market conditions that increasingly demand sustainable practices, companies with a high green intellectual capital index are able to respond to external challenges more adaptively than their competitors. Consistent with previous research by Chen and Ma (2021) and Yusoff, R., (2019), the accumulation of green knowledge and innovation within an organization enables companies to create operational efficiencies and environmentally friendly products with higher sales value, thereby sustainably increasing profitability. Empirical support indicates that when a green intellectual capital strategy aligns with market demands. Therefore, the following hypothesis can be formulated based on the theoretical explanation and research results:

H4: The Green Intellectual Capital Index has a Positive Impact on Financial Performance.

Environmental Performance and Enterprise Risk Management

Based on agency theory, there is a potential conflict of interest between management (agent) and shareholders (principal). In an environmental context, management may tend to avoid costly environmental investments because they could reduce short-term profits that serve as the basis for their bonuses. Therefore, a strong oversight mechanism is needed to ensure that management acts in line with the long-term interests of shareholders, including in mitigating environmental risks. Good environmental performance reflects that the agent has fulfilled his principal mandate to maintain the company's sustainability and minimize the potential for lawsuits or regulatory sanctions that could damage the company's value. This research, conducted by Sari (2021), found that environmental performance positively influences corporate risk disclosure, as companies with strong green performance tend to have more transparent risk governance to attract investors. Furthermore, the effectiveness of ERM within a company will increase along with a strong commitment to the environment, as environmental risk is one of the most volatile components of business risk today. Therefore, the hypothesis that can be formed based on the theoretical explanation and the results of previous research is as follows:

H5: Environmental Performance has a positive effect on Enterprise Risk Management.

Environmental Performance versus the Green Intellectual Capital Index

From the Resource-Based View (RBV) perspective, superior environmental performance is seen as a manifestation of mastery of valuable, rare, unique, and difficult-to-imitate internal resources. A company's ability to achieve good environmental performance depends not only on physical technology but also on the accumulation of knowledge, technical expertise, and a sustainability-oriented organizational culture. Success in mitigating environmental impacts serves as a stimulus, where the process of

continuous environmental improvement requires increased employee competency (green human capital) and improvements to operational systems (green structural capital). Consistent with previous research by Hart (1995) and the Natural Resource-Based View theory Russo & Fouts (1997), positive environmental performance encourages organizations to continuously innovate and strengthen their green knowledge base to maintain a competitive advantage in the marketplace. Therefore, the following hypothesis can be formed based on theoretical explanations and previous research:

H6: Environmental Performance has a positive effect on the Green Intellectual Capital Index.

Green Accounting on Financial Performance through Enterprise Risk Management

From a signaling theory perspective, the implementation of Green Accounting serves as a positive signal sent by management to external parties, demonstrating the company's transparency and commitment to environmental issues. Disclosure of high-quality green accounting information helps reduce information asymmetry between managers and investors and demonstrates that the company has robust internal control mechanisms in place to mitigate environmental risks. This information strengthens the company's Enterprise Risk Management (ERM) system, as measurable environmental data facilitates risk management in identifying potential operational and regulatory threats early. Consistent with previous research by Shad & Lai (2022), integrating sustainability aspects into the ERM framework demonstrates to the market that the company is professionally managed and prepared to face future uncertainties, thereby enhancing the organization's credibility in the eyes of stakeholders. Therefore, the following hypothesis can be formulated based on theoretical explanations and previous research:

H7: Green Accounting has a positive effect on Financial Performance through Enterprise Risk Management.

Green Accounting on Financial Performance through the Green Intellectual Capital Index

From a Resource-Based View (RBV) perspective, the implementation of Green Accounting is the development of information capabilities that enable companies to identify and manage strategic environmentally-based resources more effectively. Accurate information on environmental costs and investments serves as an essential database for developing the Green Intellectual Capital Index (GICI), whether through improving employee competency (green human capital), improving green operational systems (green structural capital), or strengthening stakeholder networks (green relational capital). Consistent with previous research by Chen and Ma (2021), companies that are able to transform environmental accounting data into structured organizational knowledge will possess unique intangible assets that are difficult for competitors to imitate, serving as the primary foundation for creating competitive advantage. Therefore,

the following hypothesis can be formulated based on the theoretical explanation and research results:

H8: Green Accounting has a positive effect on Financial Performance through the Green Intellectual Capital Index.

Environmental Performance on Financial Performance through the Green Intellectual Capital Index

From the Resource-Based View (RBV) perspective, specifically the Natural Resource-Based View (NRBV), superior environmental performance is the result of a company's strategic capabilities in managing resource constraints and ecological demands. A company's success in achieving high environmental standards depends not only on physical technology but also on the organizational learning process that fosters the Green Intellectual Capital Index (GICI). Positive environmental performance encourages increased employee knowledge (green human capital), strengthened efficient operational systems (green structural capital), and increased stakeholder trust (green relational capital). Consistent with previous research by Hart (1995) and Chen and Ma (2021), tangible environmental achievements act as a catalyst for the accumulation of valuable, rare, and difficult-to-imitate intangible assets, which strengthen a company's green intellectual capital position in the market. Therefore, the following hypothesis can be formulated based on the theoretical explanation and the research results:

H9: Environmental Performance has a positive effect on Financial Performance through the Green Intellectual Capital Index.

Environmental Performance to Financial Performance through Enterprise Risk Management

From the perspective of Stakeholder Theory, companies have a moral and strategic obligation to meet the expectations of various stakeholders, and superior environmental performance demonstrates the fulfillment of this responsibility. A company's success in positively managing its environmental impacts provides social legitimacy, strengthening its Enterprise Risk Management (ERM) system. By achieving high environmental standards, companies proactively mitigate critical risks of primary concern to stakeholders, such as regulatory risk, litigation risk, and reputational risk. Consistent with previous research by Shad & Lai (2022) and Giannopoulos et al. (2022), strong environmental performance enables risk managers to more comprehensively identify non-financial threats, thereby making the ERM framework more effective in maintaining operational sustainability from external pressures. Therefore, the following hypothesis can be formulated based on theoretical explanations and previous research findings:

H10: Environmental Performance has a positive effect on Financial Performance through Enterprise Risk Management.

3. METHODOLOGY

This research uses quantitative data taken from secondary data sources, namely annual reports and sustainability reports of companies in the basic materials, healthcare, and industry sectors, according to the variables needed in public research and research in the Indonesian Stock Exchange (BEI) during the period 2022-2024. Sample collection was carried out using purposive sampling. Purposive sampling is a technique for collecting sample data sources with specific criteria (Sugiyono, 2017). This research uses a statistical tool, namely Structural Equity Modeling (SEiM) on SmartPLS software, to analyze variables in the research. The analysis stages consist of descriptive statistics of variables, model evaluation consisting of: analysis of measurement models (outer model), analysis of structural models (inner model) and hypothesis testing to answer the theoretical hypothesis, namely to test the variables of financial accounting and environmental performance on the external variables, namely the financial performance of the company and to determine the effect of financial capital as a modeling variable and internal risk management (ERM) as a mediating variable.

Research Instrument

Green Accounting

Green Accounting is the first independent variable in this study. Green accounting refers to the disclosure of environmental information in corporate reporting, including environmental assets, liabilities, investments, CSR activities, environmental costs, and profit information. This study adopts the Green Accounting disclosure index developed by Lako (2018). The index is measured by comparing the number of disclosed environmental accounting items with the total applicable disclosure items using the following formula.

$$GA = n/k$$

Where:

GA : Accounting Information,

n : number of items disclosed, and

k : number of items that should be included in the accounting information

Environmental Performance

Environmental performance was measured using Global Reform Initiative (GRI) 300, consisting of five dimensions: materials, energy, water and effluent, biodiversity, and emissions. Disclosure was measured using a dichotomous scoring method (1 = disclosed; 0 = otherwise). The number of disclosure items in the GRI 300 includes 30 disclosure items related to the environment. These items are key in calculating environmental performance (Putri & Hikmah, 2021).

Table 1
Research Instrument Environmental Performance

No.	Global Reporting Initiative	Measurement Items
1.	Materials	Materials used by weight or volume Recycled input material used Reclaimed products and their packaging materials
2.	Energy	Energy intensity Reduction of energy consumption Reduction in energy requirements of products and services
3.	Water and Effluent	Interactions with water as a shared resource Management of water discharge-related impacts Water withdrawal Water discharge and water consumption
4.	Biodiversity	operational sites of high biodiversity value outside protected areas Significant impacts of activities, products, and services on biodiversity: Habitats protected or restored IUCN red list species
5.	Emission	Direct (scope 1) GHG emissions Energy indirect (scope 2) GHG emissions Other indirect (scope 3)

Source: (Putri & Hikmah, 2021)

The following is a description of environmental performance:

$$KL = n / k$$

Where:

KL = Environmental Performance,

n = number of items disclosed, and

k = number of items that should be included in the environmental performance description.

Enterprise Risk Management

Damayanti & Venusita (2022) states that companies must mitigate risks in areas where they lack the advantage of collaborative information and exploit risks in areas where they lack the advantage or benefit of the company.

Table 2
Research Instrument Enterprise Risk Management

No.	ERM	Measurement Items
1.	Control Environment	Commitment to ethical values Supervision Existing structure, authority, and responsibility Commitment to competence Accountability
2.	Risk assessment	The company has appropriate objectives Risk analysis

3. Control activities	Fraud risk analysis
	Change analysis
	Balance of control
	Balance of technology
4. Monitoring	Good internal communication
	Good external communication
	Carry out sustainable evaluation
	Carry out an evaluation of the company's entrepreneurial skills

Source: Damayanti & Venusita (2022)

The following is a description of enterprise risk management:

$$\text{ERM} = \text{Total index used} / \text{Total disclosure indeks}$$

Green Intellectual Capital Index

The Green Intellectual Capital Index Zhang, Chen & Huang (2023) is a combination of environmental concerns and intellectual capital to compensate for the perceived inadequacy of environmental issues. Based on (Cortez, 2007), companies that can manage green intellectual capital more flexibly are able to compete with competitors where there is creation, transfer, and application of knowledge related to more products and services.

Table 3
Research Instrument Green Intellectual Capital

No.	Category	Description
1.	Relation Capital	Companies respect each other's commitments and commitments in environmental collaboration.
2.	Structural Capital	The company (in environmental collaboration) : - Maintains close social relationships with its partners - Spends a significant amount of time interacting with others - Communicates with others
3.	Human Capital	Companies (in environmental collaboration) : - Share the same views on coinciding with each other - Share the same values in communicating with each other - Use the same professional language to intuitively communicate
4.	Knowledge Sharing	Companies share work reports, experiences, and knowledge about more effective ways to collaborate in environmental collaboration
5.	Innovation Performance	The innovativeness of the company's product, new ideas introduced, and adherence to schedules related to the management of the company.

The following is a description of green intellectual capital:

$$\text{GICI} = n / k$$

Where:

GICI : green intellectual capital

n : number of items disclosed, and

k : nnumber of items that should be included

4. RESULT AND DISCUSSION

Descriptive Statistics

Table 4
Descriptive Statistics

Explanation	N	Minimum	Maximum	Mean	Std. Deviation
Financial Performance	231	0,25	72,2	8,537	9,773
Green Accounting	231	0	1	0,74	0,292
Materials	231	0	1	0,632	0,18
Energy	231	0	1	0,522	0,411
Water and Effluent	231	0	1	0,36	0,319
Biodiversity	231	0	1	0,271	0,297
Emission	231	0	1	0,379	0,37
Control Environment	231	0	1	0,856	0,246
Risk assessment	231	0	1	0,779	0,277
Control activities	231	0	1	0,808	0,3
Monitoring	231	0	1	0,608	0,356
Green Relantionship Capital	231	0,5	1	0,947	0,119
Green Structural Capital	231	0	1	0,744	0,297
Green Human Capital	231	0	1	0,497	0,382
Knowledge Sharing	231	0	1	0,639	0,332
Inovation Performance	231	0	1	0,475	0,435

Source: Processed by the auditor using SmartPLS 3.1 (2026)

Based on an analysis of 231 observations, the Financial Performance variable shows significant variation, with a mean value of 8.537 and a relatively high standard deviation (9.773), indicating a performance gap between companies in the sample. The Green Accounting variable shows an average disclosure level of 0.74, indicating that the majority of companies have adopted environmental accounting reporting, although not yet optimally. In the Environmental Performance dimension, the "Material" indicator has the highest mean (0.632), while the "Biodiversity" indicator shows the lowest value (0.271). This reflects that companies' focus is still on the efficiency of physical production inputs rather than broader ecosystem conservation. Meanwhile, the Green Intellectual Capital aspect shows that the Relationship Capital aspect has been well managed (mean 0.947), but the Human Capital (0.497) and Innovation Performance (0.475) aspects still require significant improvement.

Model Evaluation

This study used the Partial Least Squares (PLS) approach with the assistance of SmartPLS version 3.0 software, through three stages: outer model analysis, inner model analysis, and hypothesis testing.

Measurement Model Analysis (Outer Model)

In this stage, testing was conducted using SmartPLS version 3.0. The validity test used was construct validity. Construct validity testing can be performed by examining the strength of the correlation between the construct and its constituent indicators, as well as its weak relationships with other constructs. Construct validity consists of convergent validity and discriminant validity.

A) Convergent Validity

In principle, convergent validity relates to measuring the correlation of a construct. Convergent validity occurs when scores obtained from two different instruments have a high correlation.

Table 5
Convergent Validity

Explanation	VIF	Explanation	Maximum
Financial Performance	1,000	Control Environment	3,643
Green Accounting	1,000	Risk assessment	2,740
Materials	1,055	Control activities	3,959
Energi	2,617	Monitoring	1,414
Water and Effluent	1,801	Green Relationship Capital	1,058
Biodiversity	2,206	Green Structural Capital	1,491
Emission	2,636	Green Human Capital	1,402
		Knowledge Sharing	1,510
		Inovation Performance	1,355

Source: Processed by the auditor using SmartPLS 3.1 (2026)

Convergent validity can be seen from the loading factor for each construct indicator. The rule of thumb used to assess convergent validity is an outer loading value > 0.7 , communality > 0.5 , and Average Variance Extracted (AVE) > 0.5 . Based on Table 4.3, it can be seen that all variables and indicators have outer loading values above 0.7, thus all variables and indicators are valid.

B) Discriminant Validity

After testing the outer loading, discriminant validity was conducted by examining the communality and Average Variance Extracted (AVE) values. Based on the calculations carried out by the PLS algorithm, the communality and AVE values were obtained.

Table 6
Discriminant Validity

Explanation	Communality	Akar AVE
Environmental Performance	0,805	0,545
Enterprise Risk Management	0,911	0,722
Green Intellectual Capital Index	0,667	0,419

Source: Processed by the auditor using SmartPLS 3.1 (2026)

Based on the AVE table, the Enterprise Risk Management variable has the highest AVE root value of 0.722. However, there are critical points for the Green Intellectual Capital Index variable, which has AVE and communality values below the 0.5 threshold. This indicates that several indicators do not meet convergent validity requirements and require further evaluation in future research.

Structural Model Analysis (Inner Model)

After measuring the model and finding that each construct met validity and reliability requirements, the structural model was tested. Using PLS, the structural model was tested using the R-squared (R²) coefficient for the dependent construct and the Path coefficient to test the significance between constructs in the model. The R² results of 0.67, 0.33, and 0.19 indicate that the models are “good”, “moderate”, and “weak”.

Table 7
Structural Model Analysis

Variabel	R Square
Financial Performance	0,086

Source: Processed by the auditor using SmartPLS 3.1 (2026)

Based on Table 7, the R² value for the financial performance variable is 0.086. This means that 8.6% of the variation in financial performance is influenced by Green Accounting, Environmental Performance, Enterprise Risk Management (ERM), and the Green Intellectual Capital Index, while the remaining 91.4% is explained by other independent variables not included in this research model. Based on the results above, the R² calculation is categorized as weak, as the R² value is below 0.19.

The following is the structural model resulting from the PLS algorithm:

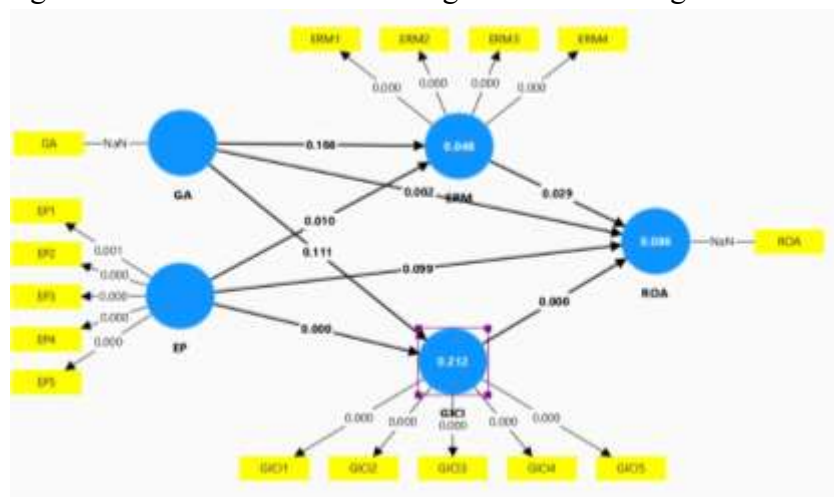


Figure 1.
Measurement and Structural Research Model
(Source: Processed by the auditor using SmartPLS 3.1, 2026)

In addition to the R2 value, the model is also evaluated by examining the Q2 predictive relevance for the constructive model. Q2 measures how well the model produces observed values and its parameter estimates. The Q2 value ranges from $0 < Q2 < 1$, with a value closer to 1 indicating a better model. This Q2 value is equivalent to the total coefficient of determination in path analysis. A Q2 value > 0 indicates the model has predictive relevance; conversely, a Q2 value ≤ 0 indicates the model has poor predictive relevance. The Q-Square predictive relevance calculation for the structural model is performed using the following formula:

$$Q2 = 1 - (1 - R12) (1 - R22)$$

$$Q2 = 1 - (1 - 0.0862) (1 - 0.9142)$$

$$Q2 = 1 - (0.993) (0.165) = 0.836$$

The Q-square value is 0.836, which is close to 1, indicating that the model is in the good category.

Bootstrapping Method

Table 8
Bootstrapping Method

Explanation	VIF
Financial Performance	0,058
Green Accounting	0,027
Environmental Performance	0,010
Enterprise Risk Management	0,031
Green Intellectual Capital Indeks	0,015

Source: Processed by the auditor using SmartPLS 3.1 (2026)

Bootstrapping models are assessed using the f-square or effect size results. Based on the f-square values above, the effect size with the f-square criteria > 0.35 and the variable's f-square on financial performance is weak because the value is between 0.02 and 0.15.

Model Fit

According to the explanation by Cangur (2015), the criteria or limits for model fit include: RMS Theta or Root Mean Square Theta value < 0.102 , SRMR or Standardized Root Mean Square value < 0.10 or 0.08 , and NFI value > 0.9 .

Table 9
Model Fit

	Saturated Model	Estimated Model
SRMR	0,097	0,100
NFI	0,697	0,694

Source: Processed by the auditor using SmartPLS 3.1 (2026)

Based on the model fit results in the table above, the SRMR (standardized root mean square) value is 0.100, which is equal to 0.10. Meanwhile, the value of 0.694 is less than 0.9. Therefore, the model meets the model fit criteria, and it can be concluded that the SRMR assessment of the model fits the data.

Hypothesis Testing

From the structural model after the bootstrapping process, a t-statistic value was generated for hypothesis testing. This t-statistic result was compared with the t-table (1.96). A direct effect is considered if the t-statistic value is >1.96 , and no effect is considered if the t-statistic value is <1.96 .

Table 10
Hypothesis Testing Results

Hypothesis	Direction	T-Statistic	P-Value	P-Value (one-tailed)	Decision
H1 = GA – ERM*	+	1,385	0,166	0,053	Accepted
H2 = ERM – ROA	+	2,189	0,029	0,015	Accepted
H3 = GA – GICI	+	1,594	0,111	0,055	Rejected
H4 = GICI – ROA	+	4,511	0,000	0,000	Accepted
H5 = EP – ERM*	+	2,581	0,010	0,050	Accepted
H6 = EP – GICI	+	8,849	0,000	0,000	Accepted
H7 = GA – ERM – ROA	+	2,176	0,030	0,015	Accepted
H8 = GA – GICI – ROA	+	3,056	0,002	0,001	Accepted
H9 = EP – GICI -ROA	+	1,649	0,099	0,045	Accepted
H10 = EP – ERM – ROA	+	4,430	0,000	0,000	Accepted

Notes: *Significant is 10%

Source: Processed by the auditor using SmartPLS 3.1 (2026)

From the results of data processing, it is known that the value of green accounting on enterprise risk management is 0.053, indicating that the t-statistic value is $1.375 < t$ -table value of 1.96, so this value shows insignificant results so it can be concluded that green accounting have affect enterprise risk management (significant 10%). The variable of enterprise risk management on financial performance is 0.015, indicating that the t-statistic value is $2.189 > t$ -table value of 1.96, so this value shows significant results, so it can be concluded that enterprise risk management has a significant positive effect on financial performance. Furthermore, green accounting on the green intellectual capital index is 0.555, indicating that the t-statistic value is $1.594 < t$ -table value of 1.96, so this value shows insignificant results, so it can be concluded that green accounting does not affect the green intellectual capital index. The green intellectual capital index value on financial performance is 0.000, indicating that the t-statistic value of 4.511 is greater than the t-table value of 1.96. This value indicates an insignificant result, so it can be concluded that the green intellectual capital index influences financial performance. The environmental performance value on enterprise risk management is 0.050, indicating that

the t-statistic value of 2.581 is greater than the t-table value of 1.96. This value indicates a significant result, so it can be concluded that environmental performance have affect enterprise risk management (significant 10%). The environmental performance value on the green intellectual capital index is 0.000, indicating that the t-statistic value of 8.849 is greater than the t-table value of 1.96. This value indicates an insignificant result, so it can be concluded that environmental performance does not affect the green intellectual capital index.

The value of green accounting on financial performance through enterprise risk management is 0.015, indicating that the t-statistic value of 2.176 > t-table value of 1.96, this value shows significant results, so it can be concluded that enterprise risk management is able to mediate green accounting on financial performance. The value of green accounting on financial performance through green intellectual capital is 0.001, indicating that the t-statistic value of 3.056 > t-table value of 1.96, this value shows significant results, so it can be concluded that the green intellectual capital index can mediate green accounting on financial performance. The value of environmental performance on financial performance through enterprise risk management is 0.045, indicating that the t-statistic value of 1.649 < t-table value of 1.96, this value shows significant results, so it can be concluded that enterprise risk management is able to mediate environmental performance on financial performance. The value of environmental performance on financial performance through green intellectual capital is 0.000, indicating that the t-statistic value of 4.430 > t-table value of 1.96, this value shows significant results, so it can be concluded that the green intellectual capital index is able to mediate environmental performance on financial performance.

Discussion

Green Accounting on Enterprise Risk Management

The analysis results indicate no significant effect between the implementation of green accounting and the effectiveness of enterprise risk management (ERM). Based on descriptive statistics, the sample's average green accounting disclosure level was 0.74, while the control environment dimension in ERM had the highest score at 0.856. This finding indicates that for companies with ERM systems strictly oriented toward short-term cost efficiency, environmental accounting implementation tends to be perceived as an additional burden that could potentially disrupt operational budget stability. This study's findings align with those of Trianaputri & Isbanah (2020) and Solovida & Latan (2017), which emphasize that green accounting can negatively impact risk profiles if implemented without proper strategic integration, resulting in little more than an administrative burden with no added value to overall risk mitigation. Theoretically, this phenomenon can be explained through trade-off theory, where allocating financial resources to developing a green accounting system reduces the availability of reserve funds that should be used to mitigate other key physical and operational risks. Suboptimal integration between environmental data and the corporate risk management framework results in compliance costs outweighing its short-term strategic benefits.

Enterprise Risk Management on Financial Performance

This study demonstrates that enterprise risk management has a positive impact on financial performance. Based on descriptive data, the average financial performance (Return on Assets) was 8.537. From an agency theory perspective, ERM disclosure acts as a positive signal to the market that agency conflicts have been minimized. Effective ERM implementation reflects good governance, where information asymmetry between management and equity holders is reduced through transparent risk reporting. These findings are consistent with studies by Saeidi, et.al., (2021), which explain that integrated risk management significantly improves cost efficiency and profit margins, especially in emerging markets. Similarly, Anton & Afloarei Nucu (2020) assert that ERM creates a sustainable competitive advantage that directly impacts the stability of a company's financial performance.

Green Accounting versus the Green Intellectual Capital Index

Based on Contingency Theory, the effectiveness of an accounting system depends heavily on its strategic alignment with a company's limited resources. The study's findings indicate that implementing complex green accounting without the support of a flexible management system actually risks reducing intellectual capital efficiency. High implementation costs, including environmental audits and compliance costs, can drain funds that should be allocated to developing green human capital (such as employee training) or green innovation research. This situation can create a rigid bureaucracy that hinders creativity and the flow of knowledge (green structural capital) within the organization. This finding supports studies by Chen & Zhang (2023) which explain that without strategic fit, green accounting can be a barrier to the growth of a company's intangible assets.

Green Intellectual Capital Index on Financial Performance

According to Contingency Theory, organizational effectiveness depends on the alignment between internal structure and external environmental demands. In the green economy transition era, companies with mature green intellectual capital have a stronger bargaining position. When the market demands environmentally friendly products, companies with high GIC can launch green products efficiently by leveraging existing networks and knowledge. This directly increases profitability through the efficiency of innovative recycling procedures and the reduction of waste and production input costs. This finding aligns with research by Saeidi & Othman (2025) and Asiaei, et.al., (2023), which emphasizes GICI as a driver of optimal performance in environmentally conscious markets.

Environmental Performance on Enterprise Risk Management

Excellent environmental performance often creates a strong positive public reputation. However, this poses an agency risk of overinvestment, where managers may make economically inefficient environmental investments for the sake of personal

reputation. In line with research by Widiastuti (2025) and Zhang (2024), managers may embellish environmental performance as a form of greenwashing to provide a false sense of security to shareholders. This high level of environmental success can lead managers to feel "on top," which risks easing oversight within the ERM system due to overconfidence from principals.

When a company achieves excellent environmental performance, this often creates a very positive public reputation. Furthermore, agency theory also addresses overinvestment, where managers invest heavily in projects that enhance their personal reputation despite being economically inefficient. This finding aligns with research conducted by (Widiastuti, 2025), (Zhang, 2024), (Sari & Astuti, 2024), and (Luo, Y., & Tang, 2023), which explains that managers may embellish environmental performance to provide a false sense of security (greenwashing) to shareholders. With a strong green corporate image, shareholders (principals) tend to be less vigilant in demanding detailed risk reporting. High environmental performance can make managers feel they have the upper hand and gain excessive trust from principals. This can lead to managers becoming complacent and easing oversight within the ERM system.

Environmental Performance on the Green Intellectual Capital Index

The results of this study demonstrate that environmental performance has a positive and significant effect on green intellectual capital. Based on descriptive statistical data, the environmental performance variable demonstrates a fairly good level of compliance, particularly for the material usage indicator (0.632), which then correlates with a high green relational capital score of 0.947. This finding indicates that the better a company's environmental track record, the stronger its accumulation of green intellectual capital.

Theoretically, this phenomenon can be explained through the Resource-Based View (RBV), where superior environmental performance not only provides ecological benefits but also serves as a source of strategic organizational learning. Activities such as the implementation of low-carbon technologies and energy efficiency require companies to develop the cognitive capacity of their employees (green human capital) and improve their managerial infrastructure (green structural capital). Furthermore, publicly recognized environmental performance serves as a positive signal that strengthens strategic relationships and trust with stakeholders (green relational capital). Thus, environmental performance acts as a key driver in enriching a company's knowledge base and green reputation.

This finding aligns with research by Asiaei & Bontis (2023), which states that when a company achieves high environmental performance, management is indirectly building a strong knowledge infrastructure. Credible environmental performance requires the support of skilled staff (green human capital) and efficient operational systems (green structural capital). Similarly, Zaid & Al-Zyadat (2024), emphasized that commitment to environmental performance strengthens the structure of green intellectual capital as an effective strategic asset to mitigate conflicts of interest between owners (principals) and managers (agents). These findings are also aligned with legitimacy theory, which

suggests that companies must reflect the values, norms, and culture of the surrounding society to gain public support (Yessica and Jesica, 2026).

Green Accounting on Financial Performance through Enterprise Risk Management

The results of this study demonstrate that Enterprise Risk Management (ERM) can mediate the relationship between green accounting and financial performance. Empirically, the sample companies had an average green accounting disclosure of 0.74, which synergized with the Control Environment dimension of ERM, which reached a value of 0.856. This finding indicates that the implementation of green accounting sends a positive signal to the market, but its financial benefits are often hampered by the uncertainty of environmental risks if not systematically managed.

This is where ERM plays a role as an internal mechanism that aligns environmental policies with a company's strategic objectives. Through the ERM framework, cost and investment data from environmental accounting are processed into effective mitigation strategies to minimize potential legal risks and reputational damage. This process reduces operational uncertainty, increases resource efficiency, and ultimately strengthens company profitability, as reflected in an average ROA of 8.537.

Theoretically, these results strongly align with Signaling Theory. The implementation of green accounting signals a company's strong commitment to sustainability, but the existence of ERM serves as a guarantee that this signal is credible and free from litigation risk. The integration of environmental accounting and risk management creates a robust internal control system, thereby minimizing revenue volatility and optimizing the company's operational cost structure. Thus, ERM is not merely a monitoring instrument, but a strategic mediating variable that translates environmental responsibility into superior financial performance.

Green Accounting on Financial Performance through Green Intellectual Capital

This study's results demonstrate that green intellectual capital (GIC) acts as a mediator linking green accounting and financial performance. This finding is supported by descriptive statistics, which show that although green accounting disclosure averages 0.74, companies already possess a very strong base of green relational capital (0.947). This indicates that transparent environmental information serves as a foundation for companies to build strategic intangible assets.

Theoretically, the implementation of green accounting provides an accurate database regarding a company's resource use and ecological impact. In accordance with the Resource-Based View (RBV), this information serves not only as a compliance report but is also absorbed by organizations to strengthen their green knowledge base. A mediating mechanism occurs when data from green accounting triggers improvements in employee competency (green human capital) and improvements in internal processes and managerial infrastructure (green structural capital).

However, the research findings also provide a critical note. Although this mediation pathway is evident, the average values for Innovation Performance (0.475) and Green

Human Capital (0.497) are still below 0.5, indicating that the transformation process from accounting data to tangible innovation is not yet fully optimized. If managed properly, this increase in environmentally-based intellectual value will enable companies to reduce waste costs and increase product appeal to environmentally conscious consumers (green relational capital), ultimately leading to increased profitability (ROA).

Thus, green accounting does not necessarily have a direct impact on net income in the short term. Its effectiveness depends heavily on management's ability to convert accounting information into environmentally-based intangible assets that create operational efficiency and competitive advantage in the green market.

Environmental Performance on Financial Performance through GICI

The results of this study demonstrate that environmental performance has a positive influence on financial performance through the mediation of green intellectual capital. This finding is supported by descriptive statistics, which show that although environmental performance indicators such as "Biodiversity" remain low (0.271), efficiency in the "Materials" aspect (0.632) has contributed significantly to strengthening green relational capital, reaching an average value of 0.947.

Theoretically, superior environmental performance acts as a catalyst for the formation of green-based intellectual capital. Based on the Resource-Based View (RBV), when a company successfully reduces emissions or manages waste effectively, these activities generate the accumulation of technical knowledge among employees and the refinement of more efficient internal processes, or green structural capital. The superior intellectual capital formed from this tangible environmental performance is then transformed into economic value for the company.

This mediation mechanism explains that the resulting products become more innovative and have a stronger bargaining position in the market because they are supported by strong strategic relationships with stakeholders, or green relational capital. Ultimately, this increases company profitability, as reflected in an average ROA of 8.537. In other words, good environmental performance does not necessarily generate instant profits, but rather builds green intellectual capacity, which companies then convert into long-term financial gains through operational efficiency and strengthening the market share of environmentally friendly products.

Environmental Performance on Financial Performance through ERM

The results of this study indicate that Enterprise Risk Management (ERM) plays a significant mediator in translating environmental performance into financial performance. Theoretically, in line with Stakeholder Theory, superior environmental performance enhances a company's legitimacy in the eyes of the public and stakeholders. However, empirical data shows that the financial impact of environmental performance can only be optimized if a company has a mature ERM system, particularly in the Control Environment dimension, which has the highest average score of 0.856.

ERM enables management to systematically identify, measure, and manage risks related to environmental issues. When a company achieves high environmental performance, particularly in the material (0.632) and energy (0.522) aspects, ERM plays a role in converting these achievements into reduced operational costs by mitigating litigation risks and increasing resource efficiency. This mechanism ensures that environmental conservation efforts are not merely about reputational gains but also impact the company's profitability, as reflected in an average ROA of 8.537.

Furthermore, sound ERM integration helps mitigate the risk of overinvestment or greenwashing practices that often arise when companies achieve excellent environmental performance for the personal satisfaction of managers. With strict oversight through risk assessment functions (0.779) and control activities (0.808), ERM acts as a strategic filter, ensuring that every environmental improvement effort makes a tangible contribution to reducing financial risk and increasing long-term profitability. This is consistent with findings (Anton & Afloarei, 2020), which confirm that sound ERM reduces information asymmetry, thereby improving financial performance.

5. CONCLUSION, IMPLICATION, AND SUGGESTION

Conclusion

This study aims to examine the role of sustainable financial performance. It reveals that the implementation of Green Accounting and the achievement of Environmental Performance have complex dynamics regarding Enterprise Risk Management (ERM). Based on Trade-off Theory, the implementation of green accounting without a well-developed strategy has the potential to become an administrative burden that disrupts liquidity and the stability of the budget for mitigating other operational risks. Furthermore, even excellent environmental performance carries agency risks in the form of satisficing or greenwashing, where managers may relax ERM oversight due to the perceived excessive trust of shareholders. This suggests that without strategic alignment, investment in green instruments can create conflicting priorities in corporate risk management. From the perspective of the Resource-Based View (RBV) and Contingency Theory, this study highlights that the Green Intellectual Capital Index (GICI) acts as a crucial bridge but is vulnerable to resource constraints. Superior environmental performance has been shown to strengthen an organization's knowledge stock (Green Human Capital) and operational infrastructure (Green Structural Capital). However, if companies focus on the high costs of green accounting compliance without managerial flexibility, funds allocated for developing intellectual innovation may be absorbed by the bureaucratic costs of reporting. The effectiveness of GICI depends heavily on an organization's ability to leverage relationships with green suppliers and customers to create a buffer against market uncertainty. Overall, this study confirms that financial performance can be improved through the mediating role of ERM and GICI. ERM serves as an internal mechanism that aligns environmental policies with strategic objectives,

reducing information asymmetry and the cost of equity. Meanwhile, GICI plays a role in transforming accounting data and environmental performance into economic value through efficient production inputs and product innovation, enabling companies to gain a strong bargaining position. Therefore, investments in the environment do not generate immediate profits; they must first be converted into robust risk management systems and competitive intellectual capacity to ensure long-term financial sustainability.

Implication

This research has implications/contributions for various parties. First, it contributes to theory by integrating and expanding the empirical literature on green accounting, environmental performance, enterprise risk management, and the green intellectual capital index. Second, it contributes to companies not only focusing on greenwashing but also building internal capacity to execute such strategies. Good environmental performance without a vigilant risk management (ERM) system can trap companies in a state of complacency that is dangerous for long-term financial stability.

Suggestion

Don't separate the sustainability department from the risk department. Integrate data from Green Accounting directly into the corporate risk profile so that environmental spending isn't seen as a burden, but rather as a long-term risk mitigation tool. Instead of investing solely in expensive reporting systems, focus on employee training to create process efficiencies (such as zero waste or energy savings) that directly impact operational cost savings.

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