Journal of Economics, Finance and Management Studies

ISSN (print): 2644-0490, ISSN (online): 2644-0504

Volume 08 Issue 05 May 2025

Article DOI: 10.47191/jefms/v8-i5-02, Impact Factor: 8.317

Page No: 2558-2571

Good Corporate Governance Moderates Green Intellectual Capital, Firm Performance and Enterprise Risk Management with Sustainability Performance

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ABSTRACT: This research aims to obtain empirical evidence and analyze good Corporate Governance moderating Green Intellectual Capital, Firm Performance, and Enterprise Risk Management with the Sustainability Performance of ESG Leaders Index Companies on the Indonesia Stock Exchange in 2021-2023. This research is quantitative research with an associative method, the data used is secondary data in the form of financial reports containing numbers and then testing and describing or providing an overview of the results. The sample selection in this research used a purposive sampling technique. The data analysis method used is panel data regression processed using Eviews version 9. The population used in this research is ESG Leaders index companies listed on the Indonesia Stock Exchange in 2021 - 2023, totaling 30 companies. The sample obtained was 24 companies with a research year of 3 years, the total research data obtained was 72. The results of this research show that green intellectual capital has a positive influence on sustainability performance, company performance has a positive influence on sustainability performance, company risk management has no influence on sustainability performance, good corporate governance can strengthen green intellectual capital with sustainability performance, good corporate governance can strengthen company performance with sustainability performance, good corporate governance cannot moderate company risk management with sustainability performance.

KEYWORDS: Green Intellectual Capital, Firm Performance, Enterprise Risk Management, Good Corporate Governance, Sustainability Performance

INTRODUCTION

Sustainability reports are one of the main media for managers to convey and disseminate information on sustainability activities to all stakeholders (Shofiyah, 2021). Through sustainability reports, companies expand their attention to the well-being of society and the environment, rather than just pursuing financial gain. Openness of sustainability reports is a company's responsibility towards the environment, social care without ignoring its capabilities (Farha et al., 2020).

Sustainability performance aims to address social, environmental and economic aspects as a company management performance in general, and in particular corporate sustainability management (Murwaningsari & Mayangsari, 2024). The increasing and significant development and progress has led to global competition in the corporate environment, so that regulators and stakeholders are increasingly demanding that companies demonstrate their performance in improving and maintaining company value (Hanifah et al., 2018).

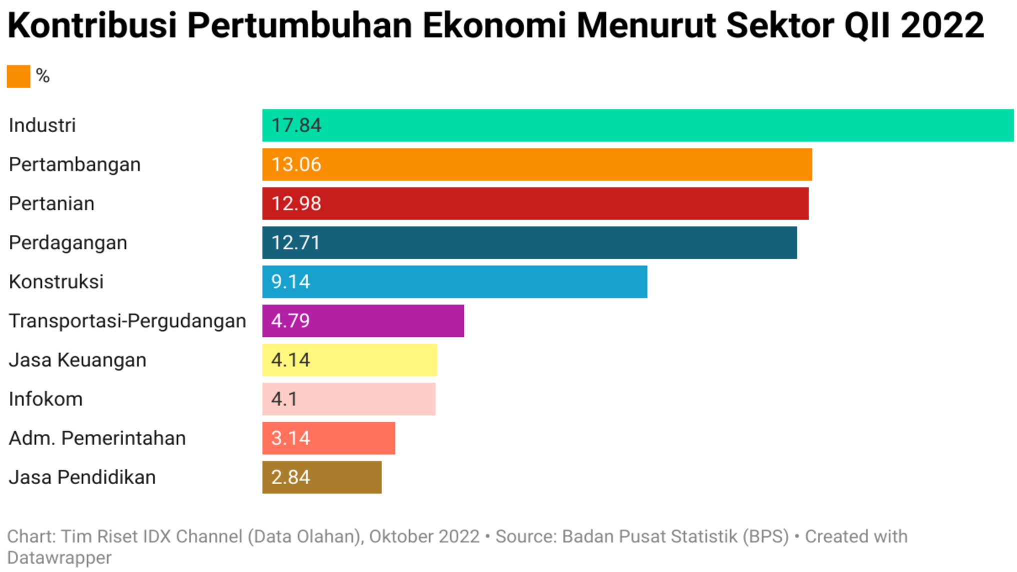

Figure I.1 Contribution to Economic Growth

Based on information from the Central Statistics Agency (BPS), non-financial sector companies are companies that have a higher contribution to Indonesia's Gross Domestic Product (GDP) compared to the financial sector. This expansion of the non-financial sector can have environmental, social and governance impacts on industrial activities, resource use and increased greenhouse gas emissions. Financial Services Authority Regulation no. 51/POJK.03/2017 concerning sustainable financial activities for Financial Services Institutions, Issuers and Public Companies. Apart from that, the implementation of ESG in Indonesia still finds various problems related to company operational activities which have an impact on the implementation of ESG. One of them is a case related to the environmental pillar, namely environmental pollution in the Karawang sea by PT Pertamina Hulu Energi in 2019 due to the leak of the YYA-1 well which resulted in a number of marine ecosystems being affected (Mewangi, 2021). Furthermore, there is the case of the social pillar at PT. GoTo (Gojek & Tokopedia) Tbk in 2020 regarding consumer data leaks and admitted that data theft had occurred as well as carrying out activities of buying and selling personal data belonging to application users (Akbar, 2021). Then, there was a case in the governance pillar, namely PT. Sumalindo Lestari Jaya Tbk in 2019 committed a number of frauds and violations and abused authority when managing the company's assets against the rights of shareholders (Riyanto, 2021).

Factors that can influence corporate sustainability performance include green intellectual capital which can be seen from previous research on intellectual capital. Green intellectual capital is one aspect that can support efforts to protect the surrounding environment in order to achieve sustainable performance. Green intellectual capital is an intangible asset in the form of information resources, innovation and knowledge which functions to increase competitive ability while protecting the environment which is able to increase sustainability performance (Yusliza et al., 2020). In addition, according to previous research on the classification of intellectual capital, this intellectual capital research is classified into three types: green human capital, green structural capital and green relationship capital (Ullah et al., 2022).

The company's firm performance also influences the company's sustainability. Because the better the company's firm performance, the better the production activities carried out by the company are in accordance with the norms and values that apply in the environment. So, it can attract legitimacy from stakeholders and this proves that the better the company's firm performance, the more stakeholders will have confidence in the company. Firm performance has a significant influence on the company's sustainable business. It is important to maintain the company's sustainability performance, one way is to try to maintain relationships with stakeholders by fulfilling stakeholder desires, including changes in stakeholder behavior. Initially, stakeholders were only oriented towards profit, but now they have changed to profit, people and planet, which means companies must respond to sustainability issues such as environment, social and governance (ESG) and then report them in sustainability reports. If a company does not have the principle of interest in protecting the social environment, it will not have sustainability in its business (Arkaan & Kusumadewi, 2023).

Enterprise Risk Management (ERM) plays an important role in efforts to develop sustainable organizations or companies through identifying, measuring and managing risks, including risks related to sustainability (Shad et al., 2019). This can also ensure company sustainability, increase efficiency, increase economic growth, and grow stakeholders' trust in the company. The relationship between ERM disclosure and company performance can be further improved by encouraging various factors related to the company, namely in the form of internal and external factors. Disclosure of sustainability reports can help increase understanding of company risks, because sustainability reports provide added value through transparency of non-financial activities and can help company risk management by providing information regarding organizational commitment and actions in environmental, social and governance aspects which can later support companies in better risk management (Mahwish et al., 2023).

In this research the author added the good corporate governance variable as a moderating variable. Good corporate governance can help create a conducive environment for efficient and sustainable growth in all company sectors. Corporate governance is understood as an important element in achieving company performance growth which makes it possible to increase investor confidence which will have an impact on company sustainability. Good Corporate Governance is said to be able to create added value for companies because by implementing Good Corporate Governance, it is hoped that companies will have good performance so that they can create added value. Good corporate governance in this research is used as a moderating variable that connects green intellectual capital, firm performance and enterprise risk management with sustainability performance. Corporate sustainability performance can be carried out well with the important role of corporate governance which is also carried out well. Corporate governance implemented by good companies can exercise control and control will ultimately create added value for the company (Tobing et al., 2019).

LITERATURE REVIEW

The stakeholder concept was first developed by Freeman (1984) to explain corporate behavior and social performance. Stakeholder theory emphasizes the importance of paying attention to and managing relationships with these various stakeholder groups to achieve long-term success. If companies can understand the interests and problems faced by each stakeholder, then they can make wiser decisions, reduce risks, and create value for all related parties (Deegan, 2004). Stakeholder theory relates to sustainability performance where stakeholders have the ability to influence corporate sustainability performance. If companies can build good relationships and accommodate stakeholder interests, it will be easier to achieve support and collaboration in an effort to achieve better sustainability performance. Sustainability performance assessments often involve indicators that cover social, environmental and economic aspects. This information can be obtained through dialogue and consultation with stakeholders, thereby ensuring that all relevant dimensions of sustainability have been considered (Murwaningsari & Mayangsari, 2024).

Signaling theory was first put forward by Spence (1973) who explained that the sender (owner of information) provides a signal or signal in the form of information that reflects the condition of a company which is beneficial for the recipient (investor). Signaling Theory basically emphasizes the principle of reducing information asymmetry between company management and stakeholders (Ulum, 2017). Signaling theory is related to green intellectual capital which is classified into green human capital, green structural capital, and green relational capital, when a company is able to fully disclose information about the condition of the company, including the capabilities of its human resources, this will be able to increase public trust in the company and guarantee its business sustainability (Josephine et al., 2020).

Aras & Crowther (2008) Sustainability Performance is a concept in company management. This concept includes sustainable development and recognizing and including environmental and social issues in the company's strategic planning. Companies can measure their level of sustainability through sustainability-oriented practices. In other words, the extent to which companies integrate sustainability into their operations and actions is what determines this performance (Ates, 2020). Companies must create sustainable value, achieve environmental goals, and balance economic and social benefits so they can generate profits in the long term by reducing risks and attracting new investors and shareholders (Aras et al, 2018).

According to Chang & Chen (2012) Green Intellectual Capital is a combination of intangible assets such as knowledge, skills and relationships with a focus on the environment, organizations and individuals. Increasing consumer knowledge about environmental issues is pushing companies to design better ways to comply with environmental trends. Green Intellectual Capital is critical to a company's long-term survival in today's competitive marketplace. Erinos and Yurniwati (2018) define green intellectual capital as the totality of intangible knowledge, assets, relationships and capabilities of an organization, which is used to preserve its environment. The relationship between signaling theory and green intellectual capital on sustainability performance can have a significant influence. Signaling theory states that in situations where asymmetric information exists between the parties involved, the party who has more information can send signals or signs to the other party to influence their perception or interpretation of the information. In the corporate context, management can use signals to communicate information to stakeholders about performance, sustainability and adopted business practices (Ulum, 2017). This view is proven in a number of studies such as Yusliza et al (2020) who found that Green intellectual capital is proven to influence sustainability performance. Similar results were also found in the research of Zalfa & Novita (2021), Al Amin & Herawaty (2024), Rahayu et al (2023). However, different results were found in the research of Jawak & Lubis (2023), that only structural capital and green relational capital have a positive influence on business. sustainability, while green human capital has no influence on business sustainability. Mixed results were also found in research by Khotimah et al (2024), that green structural capital and green relational capital had a positive effect on performance, but green human capital had no effect on sustainability performance.

H1 : Green intellectual capital has a positive influence on sustainability performance

Firm performance is the process of how the company develops (Safriani & Utomo, 2020). According to Saleksa & Firmansyah, (2014) refers to achieving the goals set by the company within the planned time period, as well as successfully meeting the targets set by the company. Firm performance can provide an overview of the company's operational and financial performance (Nguyen et al, 2022). In the context of corporate performance and sustainability performance, signaling theory can be applied to understand how companies communicate about their commitment to sustainability and how this influences stakeholder perceptions. In other words, companies try to improve their disclosure practices to send signals to stakeholders through sustainability reports. Sustainability reports are then used as a tool to strengthen communication and transparency in meeting the interests of various stakeholders, building positive relationships, and helping companies achieve their goals in a sustainable business context (Sitohang & Suhendro, 2024). Research that discusses the influence of firm performance on sustainability performance has been carried out, including Arkaan & Kusumadewi (2023), Suherman (2024), Tobing et al (2019), Sitohang & Suhendro (2024) who stated that firm performance has an influence on sustainability performance, meaning that if a company has increased profitability, this will be followed by an increase in the company's sustainable performance.

H2 : Firm performance has a positive influence on sustainability performance

Enterprise risk management is a process influenced by the board of directors, management and other personnel in the company, which is implemented in strategic settings and covers the company as a whole, designed to identify potential events that can affect the company and manage risks within its boundaries (Ardianto & Rivandi, 2018). In the context of signal theory, the implementation of Enterprise Risk Management can be seen as a signal that shows the company's commitment to sustainability. Signaling Theory provides a view of company actions in order to provide an overview in the form of information on the company's condition as a basis for making investment decisions. Disclosure of risk management will indicate a good signal because the company has implemented the principle of being transparent with its information. By managing risks effectively and disclosing relevant information to stakeholders, companies can not only improve their sustainability performance but also build a strong reputation and attract greater investment. Disclosure of company risk management will produce a good signal because the company has implemented the principle of transparent information, thereby changing market perceptions in assessing and distinguishing whether companies are of good or bad quality (Supriyadi & Setyorini, 2020). Research that discusses enterprise risk management on sustainability performance has been conducted, including Santosa & Yuyetta (2024), Mahwish et al (2023), Orabueze et al (2020), Shad et al (2019) and Oyewo (2022) which state that ERM has an influence on sustainability performance, meaning that sustainability performance and enterprise risk management (ERM) have become the main focus of attention for companies in a business context that continues to develop.

H3 : Enterprise risk management has a positive influence on sustainability performance

The application of signal theory in the context of good corporate governance and green intellectual capital involves companies' efforts to convey positive signals to stakeholders that they are implementing good and transparent corporate governance practices. Implementing these practices helps create positive signals that communicate the company's determination to implement good governance practices. This can strengthen the company's image, increase stakeholder trust, and improve sustainable performance (Tobing et al., 2019). Based on research by Jawak & Lubis (2023), good corporate governance can moderate the influence of green intellectual capital on sustainability performance due to investors' perceptions of the policies they take. Investors are independent parties who have an interest in achieving optimal company sustainability. Investors assume that companies can maintain their sustainability with the influence of good corporate governance. Apart from that, the quality of good corporate governance fully supports the improvement of the quality of green intellectual capital in the company. So it can be concluded that good corporate governance can moderate the influence of intellectual capital on sustainability performance.

H4 : Good corporate governance can strengthen green intellectual capital with sustainable performance

Good corporate governance (GCG) plays an important role in improving a company's sustainability performance. Good company performance encourages optimal implementation of corporate governance so that it can influence the sustainability of the business being run by the company. With good firm performance, the company is able to influence the performance of corporate governance so that it can influence the company's operational activities to be sustainable, namely by paying attention to the triple bottom line principle. The financial performance of a company has a positive impact on the disclosure of facts related to the social commitment of the company and the surrounding community (Wulandita Yuliawati et al, 2020). In Lu's research (2021), it is said that corporate governance has a positive influence which can prove that the large number of intangible assets can add input to the implementation of sustainability performance because the greater the number of sustainability performance measurements can have a positive influence on relationships and more effective monitoring will occur. Governance can provide benefits for a company's financial performance to be better, due to an increase in profits or rate of return which creates trust and interest among investors. Many investors consider disclosure of good corporate governance and sustainability performance as a proxy for assessing management quality. In addition, the influence of governance can support investors' assessment of the company, its risks and future performance.

H5 : Good corporate governance can strengthen firm performance with sustainable performance

In the context of signal theory, companies that implement GCG tend to be better at managing risks, including environmental and social risks. By demonstrating that they have strong systems in place to identify and address risks, companies can signal that they are better prepared to meet future challenges. Overall, good corporate governance can be seen as a signal that shows a company's commitment to sustainability. By implementing good GCG principles, companies can not only improve their sustainability performance but also build stronger relationships with stakeholders and increase competitiveness in the market (Tobing et al., 2019). In Anggraini's research (2023), companies that can deal with problems and monitor risks so that investors can take immediate action before the problem gets bigger. Better risk management in risk management practices improves business sustainability and gives investors confidence that they will receive returns from the funds they invest.

H6 : Good corporate governance can strengthen enterprise risk management with sustainable performance

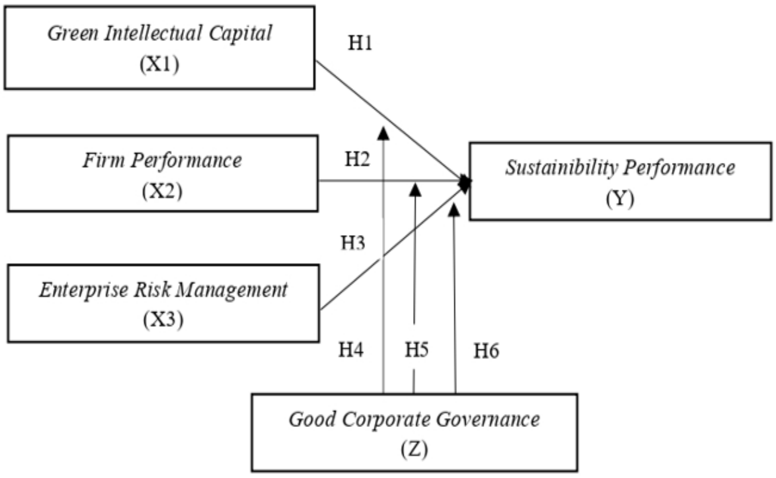

Figure I.2 Research

Sourch : Research Data, 2025

RESEARCH METHOD

This research was conducted on companies listed in the ESG Leaders index on the Indonesia Stock Exchange (BEI) from 2021-2023, the Indonesian Stock Exchange which is located at Jalan Jenderal Sudirman Kav. 52-53, Indonesian Stock Exchange Building Towers I and II, South Jakarta 12190, Indonesia which can be accessed via the website www.idx.co.id.

The dependent variable in this research is sustainability performance. Sustainability Performance emphasizes the importance of sustainable company management by paying attention to its impact on economic, environmental and social aspects. Integrating environmental and social issues in company strategic planning is the key to achieving sustainability and sustainable company performance in the long term (Anggraini, 2023). In this research, sustainability performance is measured using the ESG Score published by the company, following research conducted by Carvalho & Hersugondo (2024). ESG refers to three central factors measuring the impact of sustainability and ethics in making investment decisions. These three factors are Environmental, Social and Governance.

Skor Risiko	Kategori	Deskripsi
0 - 10	Negligible	Dianggap memiliki risiko ESG yang dapat diabaikan
10 - 20	Low	Dianggap memiliki risiko ESG yang rendah

20 - 30	Medium	Dianggap memiliki risiko ESG yang sedang
30 - 40	High	Dianggap memiliki risiko ESG yang tinggi
> 40	Severe	Dianggap memiliki risiko ESG yang berat

Sourch : Bursa Efek Indonesia (2024)

The ESG score value disclosed by the company will be divided by the maximum ESG score value, or can be formulated as follows:

ESG Score = Disclosed ESG score value

Independent variables (independent variables), are variables that influence or are the cause of changes, or the emergence of dependent variables (Sugiyono, 2017). The independent variables in this research are as follows:

1. Green Intellectual Capital

Green intellectual capital is the magnitude of the disclosure ratio regarding the combination of the concept of intellectual property owned by the company and environmental problems which are the company's risks so that it has resources that understand environmental protection. The measurement of the green intellectual capital variable in this research is based on research (Chandra & Augustine, 2019), where the items that must be disclosed consist of 5 items on green human capital, 6 items on green structural capital and 3 items on green relational capital. Chandra & Augustine (2019) The green intellectual capital assessment index is measured using a dummy variable, giving a score of 1 for each item disclosed by the company and giving a score of 0 for each item not disclosed by the company, then the number of green intellectual capital items disclosed by the company, divided by the number of green intellectual capital items that the company should have disclosed.

GIC = n/k

Where :

GIC = Green Intellectual Capital

n = Number of green intellectual capital items disclosed by the company

k = Number of green intellectual capital items that the company should disclose.

2. Firm Performance

In this research, the measurement of firm performance follows research conducted by Arkaan & Kusumadewi (2023), using return on assets (ROA), ROA or return on assets, is a profitability indicator used to measure the extent to which a company can generate profits using the assets owned by the company. ROA is a comparison between net profit after tax to the company's total assets in profit-generating activities, the results of which are expressed as a percentage. The higher the nominal value of Return On Assets (ROA), it can be interpreted that the company is getting large income with low investment. ROA can be measured using the following formula:

ROA = Net Profit / Total Assets

3. Enterprise Risk Management

Enterprise risk management or risk management is a system for monitoring risks and protecting property rights and profits of business entities or individuals against the possibility of losses arising due to a risk. Enterprise risk management (ERM) is a strategy used to evaluate and manage all risks in a company (Wardoyo et al., 2024). The risk management process includes identifying, evaluating and controlling risks that could threaten the continuity of the company's business or activities (Zulaecha et al., 2021). The Enterprise Risk Management measurement consists of 108 items covering eight dimensions based on the Enterprise Risk Management framework issued by COSO.

ERMD = Total number of ERM disclosures / ERM Maximum Score

4. Good Corporate Governance

In this research, good corporate governance is measured following research conducted by Carvalho & Hersugondo (2024), namely by using institutional ownership as a measurement indicator. So it can be formulated as follows:

GCG (Inst) = Number of shares owned by institutions / Total shares

Population is an area consisting of objects or subjects that have certain characteristics and properties that are created by researchers to study and then draw conclusions (Sugiyono, 2018). The population in this research are ESG Leaders index companies listed on the Indonesia Stock Exchange (BEI) for the 2021 - 2023 period. The number of companies listed on the ESG Leaders index is 30 companies.

Moderated regression analysis (MRA) is testing the causal relationship between the independent variable and the dependent variable which is strengthened or weakened by the presence of a moderating variable. Moderated regression analysis (MRA) uses an analytical approach that maintains sample integrity and provides a basis for controlling the influence of moderator variables (Ghozali & Ratmono, 2013). The moderating variable in this research is good corporate governance, so this research will test the interaction of the variables green intellectual capital, firm performance and enterprise risk management on sustainability performance.

$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4Z + \beta 5X1Z + \beta 6X2Z + \beta 7X3Z + \varepsilon$

Y = Sustainability Performance
a = Constant
b = Regression Coefficient
X1 = Green Intellectual Capital
X2 = Firm Performance
X3 = Enterprise Risk Management
Z = Good Corporate Governance
X1 = Interaction between green intellectual capital and sustainability performance
X2 = Interaction between firm performance and sustainability performance
X3Z = Interaction between enterprise risk management and sustainability performance
E = Error

RESULTS

This research uses companies that are included in the ESG Leaders index category (IDXESGL) which are listed on the Indonesia Stock Exchange. The ESG Leaders Index (IDXESGL) tracks the stock market performance of companies with high environmental, social and governance ratings, free from major problems, and strong financial performance and transaction liquidity. The ESG assessment and analysis of this controversy was carried out by Sustainalytics. The Indonesian Stock Exchange (BEI) collaborates with Sustainalytics to provide ESG data. Sustainalytics is one of the leading independent companies conducting research related to corporate governance and ESG. Constituents in the ESG Leaders index (IDXESGL) are selected based on the ESG data provided, data presented in the form of controversy analysis and ESG risk assessment. The population in this study was 24 companies, using a purposive sampling method, namely a technique for determining research samples with certain considerations aimed at making the data obtained more representative.

Table 1. Process and Results of Sample Selection Based on Criteria

No	Kriteria Penelitian	Tidak Memenuhi Kriteria	Memenuhi kriteria
1	Perusahaan yang terdaftar di Bursa Efek Indonesia dan telah melakukan IPO selama rentang waktu 2021 – 2023.	(1)	29
2	Perusahaan yang konsisten mempublikasikan *ESG score* pada laporan *sustainability* pada tahun 2021 – 2023.	(3)	26
3	Perusahaan yang konsisten menghasilkan laba bersih pada laporan keuangan pada tahun 2021 – 2023.	(2)	24
	Jumlah populasi yang memenuhi kriteria		24
	Jumlah tahun penelitian (2021-2023)		**3**
	Total Sampel yang di observasi		**72**

Sourch : Research Data, 2025

Table 2. Descriptive Statistical Results

	SP	GIC	FP	ERM
Mean	22.04111	0.769841	0.077092	0.478652
Median	21.99000	0.785714	0.052286	0.481481
Maximum	30.00000	0.928571	0.309881	0.537037
Minimum	11.31000	0.642857	0.002649	0.416667
Std. Dev.	4.896461	0.082382	0.073204	0.023956
Skewness	-0.287249	0.108656	1.864567	-0.042809
Kurtosis	1.946951	2.197902	6.073891	3.398807

Jarque-Bera	4.316878	2.071758	70.06575	0.499134
Probability	0.115505	0.354914	0.000000	0.779138
Sum	1586.960	55.42857	5.550626	34.46296
Sum Sq. Dev.	1702.248	0.481859	0.380480	0.040747
Observations	72	72	72	72

Sourch : Research Data, 2025

The Sustainability Performance variable observed during the research period can be seen from the output results, that the Sustainability Performance value has the lowest value of 11.31000 which occurred at PT. Erajaya Swasembada Tbk. In 2021. Meanwhile, the highest value is 30,00000, which was obtained by PT. Bank Rakyat Indonesia Tbk. In 2021. The average value (mean) is 22.04111 with a standard deviation value of 4.896461. The results of the descriptive analysis show that the mean value is greater than the standard deviation value. This means that if the mean (average) value of a data set is greater than the standard deviation, this indicates that the distribution of the data tends to be skewed towards higher values, this implies that the data tends to have high values overall and has significant variation around the mean.

The Green Intellectual Capital variable observed during the research period can be seen from the output results, that the Green Intellectual Capital value has the lowest value of 0.642857 which occurs at PT. Erajaya Swasembada Tbk. In 2021. Meanwhile, the highest value was 0.928571 obtained by PT. Pertamina Geothermal Energy Tbk. In 2022. The average value (mean) is 0.769841 with a standard deviation value of 0.082382. The results of the descriptive analysis show that the mean value is greater than the standard deviation value. This means that if the mean (average) value of a data set is greater than the standard deviation, this indicates that the distribution of the data tends to be skewed towards higher values, this implies that the data tends to have high values overall and has significant variation around the mean.

The Firm Performance variable observed during the research period can be seen from the output results, that the Firm Performance value has the lowest value of 0.002649 which occurs at PT. Adi Sarana Armada Tbk. In 2023. Meanwhile, the highest value is 0.309881, obtained by PT. Adi Sarana Armada Tbk. In 2023. The average value (mean) is 0.077092 with a standard deviation value of 0.073204. The results of the descriptive analysis show that the mean value is greater than the standard deviation value. This means that if the mean (average) value of a data set is greater than the standard deviation, this indicates that the distribution of the data tends to be skewed towards higher values, this implies that the data tends to have high values overall and has significant variation around the mean.

The Enterprise Risk Management variable observed during the research period can be seen from the output results, that the Enterprise Risk Management value has the lowest value of 0.416667 which occurred at PT. Barito Pacific Tbk. In 2022, while the highest value is 0.537037 obtained by PT. Sidomuncul Herbal Medicine and Pharmaceutical Industry Tbk. In 2021. The average value (mean) is 0.478652 with a standard deviation value of 0.023956. The results of the descriptive analysis show that the mean value is greater than the standard deviation value. This means that if the mean (average) value of a data set is greater than the standard deviation, this indicates that the distribution of the data tends to be skewed towards higher values, this implies that the data tends to have high values overall and has significant variation around the mean.

Table 3. Chow Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	15.073198	(23,45)	0.0000
Cross-section Chi-square	155.793007	23	0.0000

The chow test results are shown in table above, the Probability Cross-section F value is 0.0000 and the Probability Cross-section Chi-Square value is 0.0000. This shows the results that the two probability values are smaller than the 0.05 significance level, so in the Chow Test the model chosen is Fixed Effect, so the estimation model carried out next is the Hausman Test (Ghozali, 2016).

Table 4. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.569377	3	0.9034

The results of the Hausman test are shown in table above, the Random Cross-section Probability value is 0.9034. This shows the results that the two probability values are greater than the 0.05 significance level, so in this Hausman Test the model chosen is Random Effect, so the estimation model carried out next is the Lagrange Multiplier Test (Ghozali, 2016).

Table 5. Ragrange Multiplier Test Result

	Test Hypothesis Cross-section	Time	Both
Breusch-Pagan	48.50410	0.364833	48.86893
	(0.0000)	(0.5458)	(0.0000)

Based on the results of the Lagrange multiplier test in table above, it can be seen from the cross section-breusch pagan value in the second column, which is 0.0000 or smaller than the 0.05 significance level, so it can be concluded that the model chosen is the random effect model.Based on the results of testing using the Chow test, Hausman test and Lagrange multiplier test along with the explanation above, it can be concluded that the random effect model is the selected model.

Table 6. Panel Data Regression Analysis with Moderated Regression Test Result (Random Effect)

Dependent Variable: SP
Method: Panel EGLS (Cross-section random effects)
Date: 02/15/25 Time: 17:16
Sample: 2021 2023
Periods included: 3
Cross-sections included: 24
Total panel (balanced) observations: 72
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	91.79843	39.23102	2.339945	0.0224
GIC	40.80690	27.27814	2.495956	0.0196
FP	20.49801	45.27220	2.452773	0.0322
ERM	-77.20120	67.61251	-1.141818	0.2578
GCG	-103.8150	64.44976	-1.610790	0.1121
GICGCG	53.55828	45.86440	2.167753	0.0472
FPGCG	38.45812	64.29093	2.598189	0.0218
ERMGCG	125.5983	111.5527	1.125910	0.2644
	Effects Specification			
			S.D.	Rho
Cross-section random			4.549722	0.8386
Idiosyncratic random			1.996268	0.1614
	Weighted Statistics			

R-squared	0.884120	Mean dependent var	5.412537
Adjusted R-squared	0.716054	S.D. dependent var	1.978407
S.E. of regression	1.994224	Sum squared resid	254.5235
F-statistic	2.839740	Durbin-Watson stat	1.496897
Prob(F-statistic)	0.008635		

From the results of testing the coefficient of determination in table which has been presented above, the Adjusted R-Square value is 0.807192, which means that the value is 80.72% of the potential influence of the independent variables, namely green intellectual capital, firm performance and enterprise risk management on the dependent variable, namely sustainability performance. Meanwhile, the remaining 19.28% (100% - 80.72%) is influenced by other variables not used in this research.

From the results of the simultaneous test (F test) which has been presented in table, it can be seen that the significance value is 0.001425, the Fcount value is 2.831001 and Ftable (df 1 = 4-1 = 3 and df 2 = 72-4 = 68) at α = 0.05 is 2.740. So from these results Fcount is greater than Ftable (2.831001 > 2.740) and the significance value of 0.001425 is smaller than 0.05 (0.001425 < 0.05), so it can be concluded that green intellectual capital (X1), firm performance (X2) and enterprise risk management (X3) together influence sustainability performance (Y).

Based on the test results presented in the table above, it can be seen that the T value and significance value produced for each variable and the T table value obtained from (df = n-k = 72-4 = 68) at α = 0.05 (0.05 : 2 = 0.025) is 1.995. So it can be concluded that the results of hypothesis testing on each independent variable are as follows:

1. Green Intellectual Capital

The results of the partial test (t test) show that green intellectual capital (X1) has a Tcount of 2.261664 which is greater than the Ttable of 1.995 then (2.261664 > 1.995) and a significant value of 0.0114 which is smaller than 0.05 then (0.0114 <0.05). So it can be concluded in this research that the green intellectual capital variable has a positive influence on sustainability performance. The results of this research are in line with a number of studies such as Yusliza et al, (2020) which found that Green intellectual capital was proven to influence sustainability performance. Similar results were also found in research by Zalfa & Novita (2021), Al Amin & Herawaty (2024), Al Amin & Herawaty (2024), Rahayu et al, (2023) and Anggraini (2023). Companies that are able to manage their resources effectively will create competitive advantages that come from human resources who have high skills and competence. Companies that can manage this potential well will increase productivity, thereby increasing company performance in a sustainable manner. Based on the results obtained, if a company can manage its human resources effectively and help them develop into extraordinary and high caliber human resources, then its performance will be good, because sustainable performance occurs when HR helps improve the company's caring and environmentally conscious character. When companies manage good employees and improve relationships with consumers, suppliers and other work partners (stakeholders), this becomes an important thing for companies to do, green relational capital has a beneficial impact on sustainable performance, where one business partner can collaborate with other partners and may have many network connections needed to accelerate and improve a company's sustainable performance. This can be the company's main source of strength to be able to win competition in the business world without ignoring the welfare of the environment in which the company operates.

2. Firm Performance

The results of the partial test (t test) show that firm performance has a Tcount of 2.629626 which is greater than the Ttable of 1.995 then (2.629626 > 1.995) and a significant value of 0.0310 which is smaller than 0.05 then (0.0310 <0.05). So it can be concluded that the firm performance variable has a positive influence on sustainability performance. This research is in line with research conducted by Arkaan & Kusumadewi (2023), Suherman (2024), Tobing et al, (2019), Sitohang & Suhendro (2024) which states that firm performance has an influence on sustainability performance, meaning that if a company has increased profitability, this will be followed by an increase in the company's sustainable performance. The company will strive to carry out ESG activities requested by stakeholders so that harmonious relationships are created and the company is successful in minimizing risks arising from sustainability issues related to its business operations. In other words, high profitability gives companies the ability to be more active in various social and environmental activities, which is in line with the principles of signaling theory. Sustainability reports are then used as a tool to strengthen communication and transparency in meeting the interests of various stakeholders, building positive relationships, and helping companies achieve their goals in a sustainable business context. Profitable companies can disseminate more information about sustainability performance to promote a strong corporate image and positive impression among stakeholders. Financial performance has a positive influence on the openness of sustainability reports. This condition is because companies with high profits will disclose more sustainability information. Thus, the higher the level of company financial performance, the higher the openness of sustainability reports because the level of profits earned by the company influences the company to disclose sustainability information transparently and more widely, especially for the benefit of stakeholders.

3. Enterprise Risk Management

The results of the partial test (t test) show that enterprise risk management (X3) has a Tcount of -0.344543 which is smaller than the Ttable of 1.995 then (-0.344543 < 1.995) and a significant value of 0.7315 which is greater than 0.05 then (0.7315 > 0.05). So it can be concluded that the enterprise risk management variable has no influence on sustainability performance. The results of this research are in line with researchers who found that enterprise risk management does not have value implications for the company. For example, according to Zulaecha et al, (2021) in their study on "the effect of enterprise risk management on sustainability performance", their results fail to support the proposition that enterprise risk management is value creation. Likewise, according to Aryanti et al, (2021), their findings failed to support the theoretical expectation that enterprise risk management has a positive impact on company performance. The results of this research conclude that the implementation of enterprise risk management has no impact on sustainability performance. The implementation of enterprise risk management disclosures is still seen by companies as merely following existing regulations and does not have a direct relationship with improving sustainability performance. The implementation of enterprise risk management disclosures using COSO is still new in Indonesia so it still requires adjustments because enterprise risk management is a continuous strategic process.

4. Good Corporate Governance Moderates the Relationship between Green Intellectual Capital and Sustainability Performance

The test results for green intellectual capital moderated by good corporate governance have a Tcount of 2.167753 which is greater than Ttable 1.995 then (2.167753 > 1.995) and a significant value of 0.0472 which is smaller than 0.05 then (0.0472 <0.05). So it can be concluded that good corporate governance can moderate the influence of green intellectual capital on sustainability performance. This means that the good corporate governance variable can strengthen or increase the effect of the green intellectual capital variable on sustainability performance. The results of this research are in line with research conducted by Jawak & Lubis (2023). Good corporate governance can moderate the influence of green intellectual capital on sustainability performance due to investor perceptions in making policies or decisions taken in company management. Investors are independent parties who have an interest in achieving optimal company sustainability. Investors assume that companies can maintain their sustainability with the influence of good corporate governance. Apart from that, the quality of good corporate governance fully supports the improvement of the quality of intellectual capital. So that good corporate governance can moderate the influence of intellectual capital on sustainability performance. Good corporate governance encourages transparency in decision making and management accountability. When a company has a good corporate governance system, information regarding the use of green intellectual capital will be more easily accessible to stakeholders. Good corporate governance helps companies build strong relationships with stakeholders, including customers, employees and communities. This can increase trust and support from investors and consumers, which in turn can increase performance satisfaction. By moderating the influence of green intellectual capital, good corporate governance can help companies to focus more on innovation that supports demand, thereby improving overall demand performance.

5. Good Corporate Governance Moderates the Relationship between Firm Performance and Sustainability Performance

The test results show that firm performance moderated by good corporate governance has a Tcount of 2.598189 which is greater than the Ttable of 1.995 then (2.598189 > 1.995) and a significant value of 0.0218 which is smaller than 0.05 then (0.0218 <0.05). So it can be concluded that good corporate governance can moderate the influence of firm performance on sustainability performance. This means that the good corporate governance variable can strengthen or increase the effect of the firm performance variable with sustainability performance. This research is in line with research by Lu (2021), which states that corporate governance has a positive influence which can prove that a large number of intangible assets can add input to the implementation of sustainability performance because the greater the number of sustainability performance measurements can have a positive influence on relationships and more effective monitoring will occur. Governance can provide benefits for a company's financial performance to be better, due to increased profits or rates of return which creates trust and interest among investors. Many investors consider disclosure of governance and sustainability performance as a proxy for assessing management quality. In addition, the influence of governance can support investors' assessment of the company, its risks and future performance. Good corporate governance (GCG) plays an important role in improving a company's sustainability performance. Good company performance encourages optimal implementation of corporate governance so that it can influence the sustainability of the business being run by the company. With good firm performance, the company is able to influence the performance of corporate governance so that it can influence the company's operational activities to be sustainable, namely by paying attention to the triple bottom line principle. A company's financial performance has a positive impact on the disclosure of facts related to the company's social commitment and the surrounding community.

6. Good Corporate Governance Moderates the Relationship between Enterprise Risk Management and Sustainability Performance

The test results show that enterprise risk management moderated by good corporate governance has a Tcount of 1.125910 which is smaller than the Ttable of 1.995 then (1.125910 < 1.995) and a significant value of 0.2644 which is greater than 0.05 then (0.2644 > 0.05). So it can be concluded that good corporate governance cannot moderate the influence of enterprise risk management on sustainability performance. Research is in line with this research, where several studies have examined the relationship between enterprise risk management and sustainability performance, as well as the role of good corporate governance as a moderating variable in this relationship. However, the research results show that good corporate governance is not always able to moderate the influence of enterprise risk management on sustainability performance. The effectiveness of good corporate governance can vary between companies depending on management commitment, board structure, and organizational culture. This variability can affect the ability of good corporate governance to moderate the relationship between enterprise risk management and sustainability performance. In this context, although good corporate governance is important to ensure good governance, its role as a moderator in the relationship between enterprise risk management and sustainability performance may not always be significant. Therefore, companies need to consider other approaches, such as integrating risk management into corporate strategy and ensuring that good corporate governance practices cover risk management aspects comprehensively.

CONCLUSION

Based on the results of research on good corporate governance moderating the influence of green intellectual capital, firm performance and enterprise risk management on sustainability performance in ESG Leaders companies listed on the Indonesia Stock Exchange in 2021-2023. The number of samples in this research was 24 companies with a research period of 3 years so that the total data obtained was 72.

From the results of testing the coefficient of determination in table which has been presented above, the Adjusted R-Square value is 0.807192, which means that the value is 80.72% of the potential influence of the independent variables, namely green intellectual capital, firm performance and enterprise risk management on the dependent variable, namely sustainability performance. Meanwhile, the remaining 19.28% (100% - 80.72%) is influenced by other variables not used in this research. From the results of the simultaneous test (F test) which has been presented in table, it can be seen that the significance value is 0.001425, the Fcount value is 2.831001 and Ftable (df 1 = 4-1 = 3 and df 2 = 72-4 = 68) at $\alpha = 0.05$ is 2.740. So from these results Fcount is greater than Ftable (2.831001 > 2.740) and the significance value of 0.001425 is smaller than 0.05 (0.001425 < 0.05), so it can be concluded that green intellectual capital (X1), firm performance (X2) and enterprise risk management (X3) together influence sustainability performance (Y). Data processing used statistical tools in the form of the Eviews version 9 program by carrying out panel data regression analysis, so that the following conclusions could be drawn:

1. Green intellectual capital has an influence on sustainability performance.
2. Firm performance has an influence on sustainability performance.
3. Enterprise risk management has no influence on sustainability performance.
4. Good corporate governance can strengthen green intellectual capital with sustainable performance.
5. Good corporate governance can strengthen firm performance with sustainable performance.
6. Good corporate governance cannot moderate green intellectual capital with sustainability performance.

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