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Green Innovation as a Mediator between CSR, Ownership Concentration, and Financial Performance

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ABSTRACT

This study examines the mediating role of green innovation in the relationship between Corporate Social Responsibility (CSR), Ownership Concentration (OC), and Financial Performance (FP) in the energy and basic materials sector in Indonesia. Data from 20 companies from 2020 to 2023 were analyzed using panel data regression and Sobel test. The findings show that CSR positively affects GI but has no significant direct effect on FP. Meanwhile, OC has no significant effect on GI and a negative effect on FP. Additionally, GI negatively affects financial performance but mediates the positive relationship between CSR and FP. However, GI does not significantly mediate the relationship between OC and FP. These results highlight the importance of aligning sustainable practices with a company's long-term strategy to enhance company value. This research contributes to understanding the dynamic interaction between CSR, governance structure, and innovation in achieving sustainability and profitability goals.

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SARI PATI

Penelitian ini menguji peran mediasi green innovation dalam hubungan antara Corporate Social Responsibility *(CSR), konsentrasi kepemilikan, dan kinerja keuangan dalam sektor energi* basic material *di Indonesia. Data dari 20 perusahaan yang mencakup tahun 2020-2023 dianalisis menggunakan regresi data panel dan uji Sobel. Temuan menunjukkan bahwa CSR berpengaruh positif terhadap* green innovation*, tetapi tidak memiliki pengaruh langsung yang signifikan terhadap kinerja keuangan. Konsentrasi kepemilikan tidak berpengaruh signifikan terhadap* green innovation *dan berpengaruh negatif terhadap kinerja keuangan.* Green innovation *secara langsung berpengaruh negatif terhadap kinerja keuangan tetapi memediasi hubungan positif antara CSR dan kinerja keuangan. Namun,* green innovation *tidak secara signifikan memediasi hubungan antara konsentrasi kepemilikan dan kinerja keuangan. Hasil ini menyoroti pentingnya menyelaraskan praktik-praktik berkelanjutan dengan strategi jangka panjang perusahaan untuk meningkatkan nilai perusahaan. Penelitian ini berkontribusi untuk memahami interaksi dinamis antara CSR, struktur tata kelola, dan inovasi dalam mencapai tujuan keberlanjutan dan profitabilitas*

INTRODUCTION

Environmental issues have captured the world's attention since the first Earth Summit in Rio de Janeiro in 1992 (Pérez-Calderón et al., 2021). Energy and natural resource companies contribute significantly to greenhouse gas emissions that can accelerate global warming. According to databooks.com, Indonesia is the sixth largest contributor to greenhouse gas emissions in the world, with the energy sector accounting for 44% of Indonesia's total emissions (Ahdiat, 2023). Therefore, energy companies need to find a way to improve their commitment to environmental sustainability without compromising financial performance.

Companies that focus only on financial returns and ignore their environmental responsibilities risk damaging their reputation and value. Studies show that environmental performance plays an important role in determining a company's value (Lestari & Narindra, 2022; Saputro & Indraswono, 2022). For example, the environmental damage caused by a company's operations can significantly affect its value (Becchetti et al., 2022). Thus, companies need to integrate environmental sustainability into their business strategy.

Furthermore, companies need to balance their financial performance and environmental performance (Taliento et al., 2019). Financial performance can reflect the effectiveness and efficiency of the company's management in achieving its objectives, which are generally to maximize returns to shareholders (Suryanto & Refianto, 2019). Tobin's Q can provide an overview of the company's long-term financial performance by considering potential cash flows and profitability in the future (Yao et al., 2019)

Tobin's Q is closely related to company market value. This market value can be volatile, especially in the energy and basic materials sectors. Such volatility is reflected in the rise and fall of the energy and basic materials sector stock index over the 2020-2023 period (data processed from idx.com).

Table 1 shows that the value of shares in the energy and basic materials sectors fluctuated between 2020 and 2023. The main driver of share price fluctuations is the environmental issues associated with energy companies. One such case is with PT Adaro Energy Tbk (ADRO), where it was reported on 12-13 January 2021 that the company's dredging activities and environmental degradation caused floods in South Kalimantan. This event undoubtedly affected investors' perception of the company, as seen from the share price chart after the flood (Figure 1).

The stock chart of PT Adaro Energy Tbk reveals that its share value fell sharply after the flooding incident in South Kalimantan on 12-13 January 2021. On 11 January 2021, ADRO's share value reached 1525, but dropped to 1350 on 22 January 2021. This decline demonstrates how a business's operations that negatively affect society and the environment can affect its share value. CSR and green innovations as environmental aspects and ownership concentration as a governance element are some factors that might be further investigated to address this issue.

Companies take responsibility for their impact on society and the environment through CSR practices. The relationship between CSR and financial performance has been extensively researched since the 1960s (Chouaibi et al., 2022). Today, companies

Table 1. Stock Index Value of Energy and Basic Materials Sector 2020-2023

Sector	2020	2021	2022	2023
Energy	782.851	1,139.499	2,279.547	2,100.857
Basic Materials	920.968	1,234.381	1,216.126	1,307.468

Source: Compiled by the Author, 2024

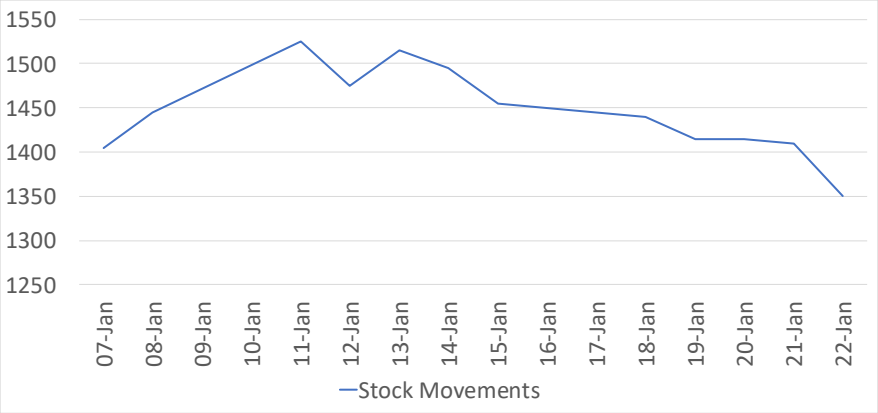

Figure 1. Stock Chart of PT Adaro Energy Tbk
Source: IDX, 2021

are expected to consider social and environmental aspects (triple bottom line) in addition to financial profit (single bottom line). This expectation encourages companies to integrate CSR into their business strategies (Purbawangsa et al., 2020). A good CSR strategy can also enhance a company's reputation and market value.

The theoretical framework of this study is based on the legitimacy and agency theories. The legitimacy theory posits that organizations must ensure their activities are perceived as legitimate by key stakeholders, including investors and the general public (Musah et al., 2022). CSR and green innovation can help companies to legitimize their activities and improve their image and reputation. Therefore, we will examine how green innovation mediates between corporate social responsibility and financial performance, as well as between ownership concentration and financial performance.

Previous research has shown mixed results regarding the effect of CSR and ownership concentration on financial performance. Khuong & Anh (2023); Purbawangsa et al. (2020); Tarjo et al. (2022); Wirawan et al. (2020) found a positive relationship between CSR and ownership concentration on financial performance, while others found no significant relationship (Musah et al., 2022).

Ownership concentration occurs when a small group of shareholders owns most of a company's shares. It can affect a company's financial performance by reducing agency costs and increasing decision-making efficiency (Rodríguez-Valencia & Lamothe Fernández, 2023). Ownership concentration can also improve or worsen financial performance, depending on how control and monitoring are exercised. Agency theory posits that reducing agency costs and mitigating potential conflicts of interest between majority and minority shareholders are crucial factors in influencing a firm's financial performance. Thus, a high level of ownership concentration can potentially reduce agency costs and enhance the efficiency of decision-making processes. Nevertheless, an excessive focus on the interests of the majority shareholders may result in conflicts with those of minority shareholders, which could ultimately diminish the company's value. Additionally, investors typically assume that the company is more vulnerable to insider control or manipulation (Liu et al., 2023).

Several previous studies support the statement that ownership concentration can affect firm value, such as Shahriar et al. (2022); Rodríguez-Valencia & Lamothe Fernández (2023); Fan et al. (2023); (Larrain et al., 2023). According to Fan et al. (2023), ownership concentration has a negative impact on firm value. High ownership concentration in listed companies in China weakens corporate governance

and accounting information quality, indirectly reducing company value. Additionally, Shahriar et al. (2022) state that excessive concentration hinders effective supervision as dominant shareholders reap personal benefits at the expense of small investors, thereby reducing firm value. Meanwhile, Mbate & Sutrisno's (2023) study discovered that the evidence does not support the hypothesis that a significant relationship exists between ownership concentration and company value.

Green innovation can improve a company's financial performance by improving its operational efficiency, product differentiation, and response to sustainable market demands. Green innovation has attracted increasing attention in recent years for its contribution to resource conservation, environmental protection, and environmental performance (Chouaibi et al., 2022). By adopting green innovations, companies can demonstrate their commitment to environmentally responsible business practices, enhance their image, and bolster their legitimacy in the marketplace. The mediating role of green innovation enables us to explore how green innovation efforts respond to the environmental challenges that companies face and how they affect financial performance (Chouaibi et al., 2022).

CSR and ownership concentration can drive green innovation, ultimately improving financial performance. However, green innovation is characterized by technical difficulties and uncertainties, which can hinder companies from undertaking green innovation activities (Wu et al., 2024). Nevertheless, should the company succeed in leveraging green innovation to its fullest potential, it can reasonably expect to see an increase in investor interest as investors perceive companies that adopt green innovation as having a greater capacity to compete with those that do not.

Next, ownership concentration is essential in enhancing the company's value (Asni & Agustia, 2022). The involvement of significant shareholders is a crucial factor in GI implementation, as they can exert influence over managerial decision-making processes, thereby facilitating the introduction of green innovation (GI) strategies that can enhance the company's value.

This study aims to contribute to the existing literature on using Tobin's Q to measure financial performance. This approach includes intangible assets, such as reputation and customer relationships, in assessing firm value. This study will also fill a knowledge gap in the literature by examining the role of green innovation as a mediator, as this topic has not been widely discussed in previous research. Therefore, this study will provide new insights into how firms can improve financial performance while maintaining environmental sustainability.

Grand Theory

Legitimacy Theory

The legitimacy theory was first proposed by Dowling and Pfeffer (1975). They explained that legitimacy is a vital resource for a company's survival. Deegan (2019) argues that corporate legitimacy is achieved when the company's outcomes match societal expectations. Thus, companies need to conduct their operations according to prevailing social values and norms to be considered legitimate. CSR and GI are ways for companies to meet societal expectations and strengthen their legitimacy. Companies can gain the trust of various parties and build a good reputation if they have strong legitimacy (Chouaibi et al., 2022). Legitimacy will also minimize external demands and pressures and lead to positive impacts, such as increased financial performance.

Agency Theory

According to Jensen and Meckling (1976), agency relationships are established through contracts between managers (agents) and firm owners (principals). This contract governs the mutually agreed powers and responsibilities of both parties. Conflicts of interest often arise because managers may make decisions that favor themselves over the

company owners. Ownership concentration can reduce this conflict by giving more control to the controlling shareholder.

Agency problems can be detrimental to a company's performance and reputation. Companies that engage in social and environmental activities must be reputable and well- managed. Thus, those in managerial roles should aim to circumvent potential agency issues by promoting environmentally focused strategies that facilitate green innovation. The advancement of environmentally conscious innovation is also advantageous in fostering stakeholder confidence, enabling the organization to overcome the agency issue (Javeed et al., 2022).

Hypothesis Development

Impact of corporate social responsibility on financial performance

Corporate Social Responsibility (CSR) is a business model that addresses the social and environmental impacts of a company's operations (Wirawan et al., 2020). CSR disclosure can help reduce information asymmetry between managers and shareholders by providing shareholders with information about how the company treats employees, society, and the environment (Khuong & Anh, 2023), leading to growth in company value. The legitimacy theory involves understanding how CSR commitment affects financial performance and environmental reputation (Chouaibi et al., 2020). Previous studies have also indicated that corporate social responsibility (CSR) can have a positive impact on financial performance (Bing & Li (2019), Chouaibi et al., (2022), Hou (2019), Khuong & Anh (2023), Purbawangsa et al. (2020), Rahman & Fang (2019), Tarjo et al., (2022), Wirawan et al., (2020), Zolotoy et al., (2019). Therefore, the researcher proposed the following hypothesis:

H1: Corporate social responsibility has a significant positive effect on financial performance

Impact of ownership concentration on financial performance

Ownership concentration refers to a situation where most of the shares are held by a particular group and are relatively dominant compared to others (Zulkarnain et al., 2023). Based on the agency theory, the more concentrated the ownership of shares by controlling shareholders, the fewer conflicts of interest between shareholders and management, and the better the company's financial performance. High ownership concentration can help align the interests of shareholders and management (Ndua et al., 2023). Shareholders also tend to make decisions that focus on increasing the company's long-term when they have greater control over the firm.

High ownership concentration gives controlling shareholders the power (Hashmi et al., 2023) to monitor and control management effectively. This condition can help reduce the potential for opportunistic management behavior (Hashmi et al., 2023). Previous research also supports such statements (Hashmi et al., 2023; Rodríguez-Valencia & LamotheFernández, 2023). Thus, the researchers formulated the following hypothesis:

H2: Concentrated ownership has a positive impact on financial performance

The impact of corporate social responsibility on green innovation

This study defines green innovation as technological advances in the production process (green process innovation) that help energy sector companies improve overall environmental sustainability. A previous study found that CSR encourages environmentally friendly behavior among employees in Pakistani organizations, reducing environmental pollution (Ahmad et al., 2021). Thus, CSR can help companies to innovate more effectively (Martinez-Conesa et al., 2017). In another study, Suganthi (2020) states that CSR benefits a company's environmental, cost, and market performance. Moreover, CSR is associated with several performance measures, including economic, social, economic, and environmental performance, among electric utilities in the United

States (Ait Sidhoum & Serra, 2018). These studies suggest a relationship between CSR and green innovation, and this relationship contributes to a healthier environmental system, leading to better economic outcomes. This finding aligns with the legitimacy theory, where firms are concerned with their own interests and the wider community's interests.

Furthermore, Kraus et al. (2020) determined that corporate social responsibility (CSR) has a notable positive impact on green innovation. This research finding is also supported by several studies (Dai et al., 2022; Hao & He, 2022; Hong et al., 2020; Javeed et al., 2022; Ma et al., 2023). Therefore, the researcher proposed the following hypothesis:

H3: *Corporate social responsibility has a significant positive effect on green innovation*

The effect of ownership concentration on green innovation

From a legitimacy perspective, companies engage in corporate actions that strategically adopt social and environmental values. Meanwhile, the controlling shareholders closely monitor management's actions because their primary objective is increasing the company's value (Wu & Hu, 2020). However, conflicts may arise if there is a difference in orientation between management and shareholders. Nevertheless, managers can encourage the implementation of corporate environmental strategies to facilitate green innovation. Promoting green innovation is also beneficial for building stakeholder trust, consequently helping the company solve its agency problems (Javeed et al., 2022).

Highly concentrated ownership allows for the effective control of management and other shareholders (Javeed et al., 2022). This argument is supported by research conducted by Asni and Agustia (2022), Javeed et al. (2022), and Wu and Hu (2020), which indicate that ownership concentration has a significant positive effect on green innovation. Thus, the researchers proposed the following hypothesis:

H4: Ownership concentration has a significant positive effect on green innovation

The impact of green innovation on financial performance

Green innovation is key to ensuring long-term sustainability (Iqbal, 2019) as it allows businesses to enhance their resources' productivity (Papagiannakis et al., 2019). The term "green innovation" encompasses environmentally friendly hardware and software innovations. Such innovations include technological innovations in energy conservation, pollution prevention, waste recycling, product design, and environmental management (Husnaini & Tjahjadi, 2021).

In this research, green innovation refers to green process innovations. Such innovations can reduce waste, minimize pollution, and promote resource recovery by introducing new processes to minimize negative environmental impacts and improve future business performance (Husnaini & Tjahjadi, 2021). This commitment to sustainability signifies the company's dedication to long-term sustainability, generating a positive response from investors and encouraging an increase in company value (Husnaini & Tjahjadi, 2021). Fernando et al. (2019) echoed this sentiment by highlighting that green innovation enhances a company's competitiveness and strengthens its sustainable development capabilities. Additionally, Yuniarti et al. (2022) and F. Zhang et al. (2020) assert that green innovation positively influences business value. Considering the extensive existing literature on this topic, the researchers proposed the following hypothesis:

H5: *Green innovation has a significant positive impact on financial performance*

The effect of corporate social responsibility on financial performance through green innovation

Bonsu et al. (2024) argue that CSR can positively influence environmental performance through green innovation, leading to increased competitiveness. This argument is supported by Chouaibi et al. (2022), who found that green innovation can mediate the relationship between corporate social responsibility practices and financial performance. These findings align with the legitimacy theory, which focuses on the interaction between companies and society. Additionally, with the public's growing concern for the environment, they demand that companies pay greater attention to their operations' impact on the surrounding environment.

Several studies have also found that implementing CSR will provide companies with a push for green innovation (Dai et al., 2022; Hao & He, 2022; Hong et al., 2020; Javeed et al., 2022; Ma et al., 2023). Subsequently, the green innovation undertaken by the company will increase its value (Yuniarti et al., 2022; Zhang et al., 2020). Thus, the researchers proposed the following hypothesis:

H6: ***Corporate social responsibility has a significant positive effect on financial performance through the role of green innovation***

The effect of ownership concentration on financial performance through green innovation

Previous studies have investigated the effect of ownership concentration on company value using agency theory, showing that agency disputes tend to be investigated with a narrow perspective, mainly based on the relationship between the company's owners and managers (Parkinson, 1994). Therefore, an investigation with the legitimacy theory perspective is needed because companies strategically engage in corporate actions that adopt social and environmental values (Utomo et al., 2019). Companies need community legitimacy as it is a strategic factor for the company's future development.

According to Utomo et al. (2019), there are three reasons why shareholders care about the environment: 1) dissatisfaction with environmental fines that may reduce their income, 2) disappointment with the slow progress in environmental performance, and 3) difficulty in raising new capital or attracting new investors (Utomo et al., 2019). Therefore, dominant shareholders (ownership concentration) tend to make decisions that maximize the company's economic, social, and environmental objectives.

Controlling shareholders would support the firm's innovation strategy because it is the most effective way to increase company value. According to Utomo et al. (2019), ownership concentration can impact company value through green innovation. Therefore, the researchers proposed the following hypothesis:

H7: Ownership concentration has a significant positive effect on financial performance through the role of green innovation.

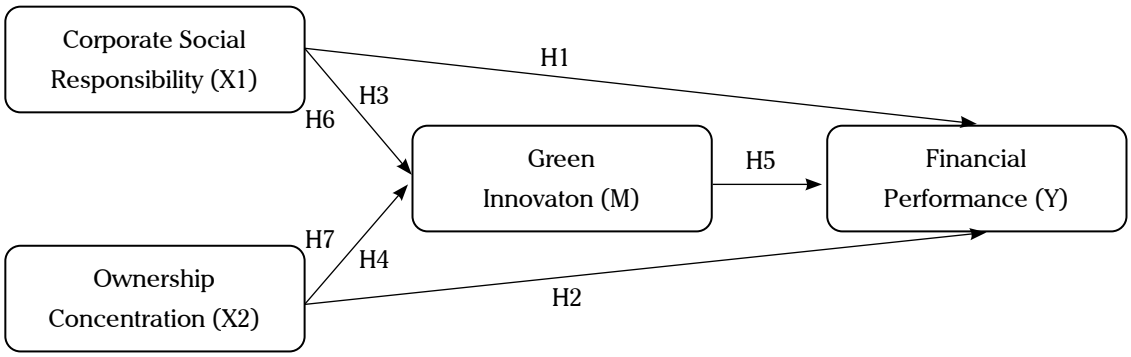

Figure 2. Conceptual Framework

METHOD

Sample selection and data collection

This study used secondary data from the company's official website and idx.com. The sample comprises energy and basic materials companies that have fully published their financial reports, annual reports, and sustainability reports for 2020-2023. Based on these criteria, the sample comprises 20 companies (Table 2).

Variables

Dependent Variables

Financial Performance

Financial performance can be measured in several ways, such as market-to-book value, return on assets, return on sales, return on capital, and Tobin's Q (Chouaibi et al., 2022). Tobin's Q was chosen as the financial performance indicator for this study because it is less easily manipulated by managers than profitability ratios such as ROA and ROE (Z. Xie et al., 2022). Tobin's Q is the market value of equity plus debt divided by total assets (Indrarini, 2019).

Independent Variables

Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR) addresses the social and environmental impacts of a company's operations (Wirawan et al., 2020). Government Regulations Number 40 Year 2007 requires natural resource companies to implement and report their CSR activities. This law is the basis for CSR reporting in Indonesia, but reporting is still voluntary. This study measures companies' corporate social responsibility (CSR) practices using the GRI G4 Disclosure Index, which consists of three main topics: economics, social, and environmental.

Ownership Concentration

Concentrated ownership refers to a situation where most of a company's shares are held by a particular group who are relatively dominant compared to others (Zulkarnain et al., 2023). It occurs when some individuals own > 5% of the company's shares. This study determines the controlling shareholders as individuals with the largest percentage of ownership above 5% (Agustin & Widiatmoko, 2022).

Table 2. Companies used in this study

No	Code	Company Name	Sector
1	ABMM	ABM Investama Tbk.	Energy
2	ADRO	Adaro Energy Indonesia Tbk.	Energy
3	AKRA	AKR Corporindo Tbk.	Energy
4	BUMI	Bumi Resources Tbk.	Energy
5	INDY	Indika Energy Tbk.	Energy
6	PSSI	IMC Pelita Logistik Tbk.	Energy
7	PTBA	Bukit Asam Tbk.	Energy
8	PTRO	Petrosea Tbk.	Energy
9	TOBA	TBS Energi Utama Tbk.	Energy
10	BRMS	Bumi Resources Minerals Tbk.	Basic Materials
11	FPNI	Lotte Chemical Titan Tbk.	Basic Materials
12	GGRP	Gunung Raja Paksi Tbk.	Basic Materials
13	INRU	Toba Pulp Lestari Tbk.	Basic Materials
14	INTP	Indocement Tunggal Prakarsa TbK	Basic Materials
15	ISSP	Steel Pipe Industry of Indones	Basic Materials
16	SMCB	Solusi Bangun Indonesia Tbk.	Basic Materials
17	SMGR	Semen Indonesia (Persero) Tbk.	Basic Materials
18	TINS	Timah Tbk.	Basic Materials
19	TPIA	Chandra Asri Pacific Tbk.	Basic Materials
20	TRST	Trias Sentosa Tbk.	Basic Materials

Mediating Variables

Green Innovation

Green innovation is used as a mediating variable in this study. The mediating variable (M) differs from the intervening variable (Z), although it is often thought to be the same. According to Kerlinger and Lee (2000), mediators explain the process or mechanism by which the independent variables affect the dependent variables. This study used the Green Process Innovation Index to measure the mediating variable (X. Xie et al., 2019). The Green Process Innovation Index comprises the following indicators:

1. Reduction of resources and energy use and increasing their efficiency
2. Use of recycled materials, recycling techniques, and environmental technologies
3. Implementation of environmental campaigns
4. Use of pollution control equipment
5. Adoption of pollution control projects and technologies.

Table 3. Operational Variables

Variable	Measure	Scale
Financial Performance (Y)	Tobin's Q = $\frac{\text{MVE + DEBT}}{\textit{Total Asset}}$	Ratio
Corporate Social Responsibility (X1)	CSRIj = $\frac{\sum Xij}{nj}$ CSRIj = $\frac{\sum Xij}{91}$, Xij: Dummy variable	Ratio
Ownership Concentration (X2)	Highest shareholding	Ratio
Green Innovation (M)	GI = $\frac{\sum Xij}{nj}$ CSRIj = $\frac{\sum Xij}{5}$, Xij: Dummy variable	Ratio

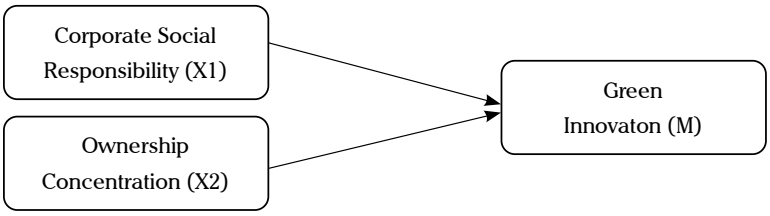

Figure 3. Substructure 1

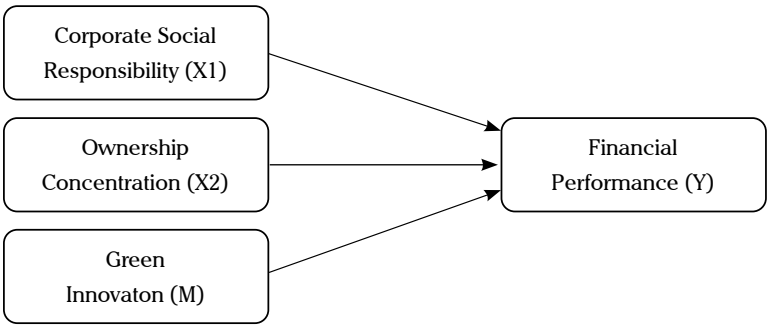

Figure 4. Substructure 2

Table 4. Descriptive Statistics Test Results

	CSR	OC	GI	FP
Mean	0.432875	0.535750	0.585000	0.469750
Median	0.435000	0.525000	0.600000	0.465000
Maximum	0.780000	0.980000	1.000000	0.960000
Minimum	0.070000	0.170000	0.200000	0.110000
Std. Dev.	0.211224	0.215052	0.182181	0.177279
Skewness	-0.083867	0.237741	0.249134	0.223422
Kurtosis	1.827924	2.442378	2.834106	3.095812
Jarque-Bera	4.672988	1.790083	0.919310	0.696167
Probability	0.096666	0.408591	0.631502	0.706040
Sum	34.63000	42.86000	46.80000	37.58000
Sum Sq. Dev.	3.524639	3.653555	2.622000	2.482795
Observations	80	80	80	80

Source: Output E-views 12, 2024

Data Analysis Procedure

The researchers performed panel regression using E-Views 12 software and the Sobel test using Microsoft Excel software to analyze the data. The model includes three main hypotheses regarding the effect of CSR, ownership concentration, and green innovation on financial performance. These equations allow the researchers to test the direct relationship between the independent variables (CSR, ownership concentration) and the dependent variable (financial performance), as well as the mediating role of green innovation. The regression equations are shown below:

$FP = \alpha + \beta 1CSRIj + \beta 2OC + e$ ..... (1)

$GI = \alpha 0 + \alpha 1CSR + \alpha 2OC + \eta$ ..... (2)

$FP = \beta'0 + \beta'1CSR + \beta'2OC + \beta'3GI + e$ ..... (2)

RESULTS AND DISCUSSION

Results

The average financial performance in this study is 0.47, indicating that companies in the energy and materials sector have relatively low financial performance. Next, the average CSR reporting score of 0.43 indicates that the average company reports only 41% of the 91 items. The average ownership concentration of 54% indicates that almost all companies in the energy and materials sector have concentrated ownership. Finally, the Green Innovation score shows an average of 0.59, indicating that the average company reports on approximately 3 out of 5 indicator items.

Regression Model Selection

Sub Structure 1

As the probability obtained was 0.95 > 0.05, Random Effects (REM) was selected. Thus, structural model 1 was tested with REM.

Table 5. Chow Test Results for Substructure 1

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	9.805138	(19,58)	0.0000
Cross-section Chi-square	115.035538	19	0.0000

Source: Output E-views 12, 2024

Table 6. Hausman Test Results for Substructure 1

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section fixed effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.104548	2	0.9491

Source: Output E-views 12, 2024

Sub Structural 2

Table 7. Chow Test Results for Substructure 2

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	16.213634	(19,57)	0.0000
Cross-section Chi-square	148560629	19	0.0000

Source: Output E-views 12, 2024

As the probability obtained was 0.00 <0.05, the Fixed Effects Model (FEM) was selected and the Hausman's test was conducted next.

Table 8. Hausman Test Results for Substructure 2

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.870738	3	0.0000

Source: Output E-views 12, 2024

As the probability obtained was 0.00< 0.05, the fixed effect model (FEM) was chosen. Thus, for substructural model 2, the hypothesis test used the fixed model (FEM).

Table 9. The Multicollinearity Test Results for Substructure 1

	CSR	OC
CSR	1	0.07606970. . .
OC	0.07606970. . .	1

Source: Output E-views 12, 2024

The correlation coefficient between X1 and X2 is 0.076<0.90, indicating that substructure 1 is free from multicollinearity.

Table 10. The Multicollinearity Test Results for Substructure 2

	CSR	OC	GI
CSR	1	0.07606970. . .	0.29521377. . .
OC	0.07606970. . .	1	0.27621111. . .
GI	0.29521377. . .	0.27621111. . .	1

Source: Output E-views 12, 2024

The correlation coefficient between X1 and X2 is 0.076 < 0.90.
The correlation coefficient between X1 and M is 0.295 < 0.90.
The correlation coefficient between X2 and M is 0.276 < 0.90.

Table 11. The Heteroscedasticity Test Results for Substructure 1

Dependent Variable: ABS(RESID)
Method: Panel EGLS (Cross-section random effects)
Date: 07/15/24 Time: 13:29
Sample: 2020 2023
Periods included: 4
Cross-sections included: 20
Total panel (balanced) observations: 80
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.088413	0.052102	1.696949	0.0937
CSR	0.025011	0.050887	0.491491	0.6245
OC	0.057999	0.082949	0.699206	0.4865

Source: Output E-views 12, 2024

X1 0.6245 > 0.05, i.e. free of heteroscedasticity
X2 0.4865 > 0.05, i.e. free of heteroscedasticity.

Table 12. The Heteroscedasticity Test Results for Substructure 2

Dependent Variable: ABS(RESID)
Method: Panel Least Squares
Date: 07/15/24 Time: 13:30
Sample: 2020 2023
Periods included: 4
Cross-sections included: 20
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.050170	0.076993	-0.651621	0.5173
CSR	-0.005409	0.036318	-0.148945	0.8821
OC	0.244105	0.135710	1.798729	0.0774
GI	-0.045972	0.053615	-0.887439	0.3948

Source: Output E-views 12, 2024

X1 0.8821 > 0.05, meaning free of heteroscedasticity
X2 0.0774 > 0.05, meaning free of heteroscedasticity
M 0.3948 > 0.05, meaning free of heteroscedasticity.

T-Test Result

Table 13. T-Test Results for Substructure 1

Dependent Variable: M
Method: Panel EGLS (Cross-section random effects)
Date: 07/15/24 Time: 12:54
Sample: 2020 2023
Periods included: 4
Cross-sections included: 20
Total panel (balanced) observations: 80
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.370024	0.092288	4.009459	0.0001
CSR	0.254293	0.076763	3.312691	0.0014
OC	0.195799	0.149353	1.310978	0.1938

Source: Output E-views 12, 2024

Table 14. T-Test Results for Substructure 2

Dependent Variable: Y
Method: Panel Least Squares
Date: 07/15/24 Time: 12:53
Sample: 2020 2023
Periods included: 4
Cross-sections included: 20
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.172176	0.151727	7.725540	0.0000
X1	-0.001883	0.071570	-0.026313	0.9791
X2	-0.061073	0.267440	-3.967517	0.0002
M	-0.227592	0.105658	-2.154053	0.0355

Source: Output E-views 12, 2024

Table 15. R-Square Test Results for Substructure 1

R-squared	0.148541
Adjusted R-squared	0.126425
S.E. of regression	0.094224
F-statistic	6.716514
Prob(F-statistic)	0.002048

Source: Output E-views 12, 2024

The value of adj. R-squared value is 0.13 (rounding), which means that the CSR and ownership concentration variables can explain the green innovation variable by 0.13 or 13%, while the remaining 87% is explained by other variables.

Table 16. R-Square Test Results for Substructure 2

R-squared	0.864695
Adjusted R-squared	0.812472
S.E. of regression	0.076770
F-statistic	16.55770
Prob(F-statistic)	0.000000

Source: Output E-views 12, 2024

The value of the adj. R-squared is 0.81 (rounding), indicating that variables X1, X2, and M can explain variable Y by 0.81 or 81%, while the remaining 19% is explained by other variables.

Sobel Test

The impact of CSR on financial performance through green innovation

$$t = \frac{ab}{\sqrt{(b^2SEa^2) + (a^2 SEsb^2)}}$$

$$t = \frac{0.25\,x - 0.23}{\sqrt{(0.23^2 x\ 0.08) + (0.25^2\,x\ 0.11^2)}}$$

$$t = \frac{0.06}{\sqrt{0.05\,x\ 0.01) + 0.06\,x\ 0.01)}}$$

$$t = \frac{0.06}{\sqrt{0.0005 + 0.0006}}$$

$$t = \frac{0.06}{\sqrt{0.0011}}$$

$$t = \frac{0.06}{0.03}$$

t = 2
t Table = TINV (0.05, 77)
t Table = 2
2 > 1.99

Therefore, hypothesis six is accepted, which means that green innovation can mediate the positive relationship between CSR and financial performance.

The Effect of Ownership Concentration on Financial Performance through Green Innovation

$$t = \frac{ab}{\sqrt{(b^2SEa^2) + (a^2 SEsb^2)}}$$

$$t = \frac{0.20\,x - 0.23}{\sqrt{(0.23^2\,x\ 0.15) + (0.20^2\,x\ 0.11^2)}}$$

$$t = \frac{-0.05}{\sqrt{0.05\,x\ 0.02 + 0.04\,x\ 0.01}}$$

$$t = \frac{-0.05}{\sqrt{0.001 + 0.0004}}$$

$$t = \frac{-.05}{\sqrt{0.0014}}$$

$$t = \frac{-0.05}{0.04}$$

t = 1.25
t Table = TINV (0.05, 77)
t Table = 1.99
1.25 < 1.99

Thus, hypothesis seven is rejected, meaning that the mediating effect of green innovation is weak in mediating the positive relationship between ownership concentration and financial performance.

Discussion

The impact of corporate social responsibility on financial performance

CSR refers to corporate governance that addresses the social and environmental impacts of a

company's activities. This study found that CSR disclosure does not affect financial performance, so the first hypothesis (H1) is rejected. Although CSR can enhance a company's social reputation and legitimacy, its impact on financial value is not always immediately apparent. These results are inconsistent with the legitimacy theory, which suggests that CSR can legitimize a company in society's eyes, improving financial performance.

This result may be because CSR focuses on meeting societal expectations and gaining stakeholder support, which is more related to long-term sustainability and reputation than short-term financial benefits (Deegan, 2019). The CSR activities undertaken by companies do not always attract stakeholders' attention, particularly in this study of energy and basic materials companies. This finding aligns with Musah et al. (2022), who also studied companies in developing countries. Investors in the shares of listed companies are not influenced by social and environmental disclosures when making investment decisions (Musah et al., 2022). Companies only engage in CSR to legitimize their activities.

CSR, which focuses on social and environmental responsibility, requires large investments that do not immediately generate significant financial returns. As a result, although companies may be valued by society and stakeholders, this increased legitimacy is not always reflected in financial performance or share prices in the short term.

Furthermore, according to the agency theory, conflicts of interest between management (agents) and shareholders (principals) may result in CSR having no impact on financial performance. The agency theory suggests that management may engage in CSR activities for personal interests, such as enhancing personal reputation or gaining other non-financial benefits, which may not align with the goal of maximizing shareholder value. If shareholders perceive that CSR activities do not add significant value or divert resources from more profitable projects, they may not view CSR as a positive contribution to financial performance. Thus, from an agency theory perspective, CSR could be seen as an inefficient expense or even a conflict of interest detrimental to shareholder value in the short term.

The impact of ownership concentration on financial performance

Ownership concentration can have a negative effect on company value. Evidence suggests that ownership concentration can increase the potential for conflicts of interest between controlling and minority shareholders (Alimehmeti & Paletta, 2009). When share ownership is concentrated in the hands of a few large shareholders, the majority shareholders have a dominant influence on the company's decision-making process. Such a situation may lead majority shareholders to make decisions that favor their personal interests but are detrimental to minority shareholders or have a negative impact on the company. For example, they may arrange transactions that benefit their personal businesses or approve policies that increase their own remuneration without considering the impact on the company's long-term value. As a result, minority shareholders' confidence in the company is diminished, which can lead to a decline in share price and shareholder value.

In addition, ownership concentration can exacerbate monitoring and control problems within the firm (Shahriar et al., 2022). Controlling shareholders may not be encouraged to monitor management effectively as they may feel quite comfortable with their dominant position. Fan et al. (2023) state that concentrated ownership can reduce the consistency of the company's financial information. Investors also view concentrated ownership as more susceptible to manipulation (Liu et al., 2023), as the controlling shareholders can more easily influence or even manipulate management toward their own interests. These situations lead to agency problems if management is not closely monitored, which can lead to sub-optimal and inefficient

business decisions. The inability to manage the business well will also have a negative impact on the business's overall performance. Ultimately, this will reduce the company's valuation in the eyes of investors and the market.

Impact of Corporate Social Responsibility (CSR) on Green Innovation

Hypothesis three (H3) states that corporate social responsibility (CSR) can positively affect green innovation because CSR practices encourage firms to operate in a more sustainable and environmentally responsible manner. H3 is accepted based on this study's findings and are consistent with previous studies (Dai et al., 2022; Hao & He, 2022; Hong et al., 2020; Javeed et al., 2022; Ma et al., 2023).

CSR initiatives can encourage companies to invest in green technologies and processes, driving green innovation. For example, companies can develop resource-efficient processes and technologies that produce less waste. In addition, good CSR practices help companies win stakeholder support, including customers, governments, and local communities, all of whom have high environmental sustainability expectations. Thus, CSR helps companies meet societal demands and encourages them to find innovative solutions to protect the environment.

Furthermore, from the legitimacy theory perspective, companies that engage in CSR seek to gain and maintain legitimacy from society at large. According to this theory, companies would act for their financial interests while meeting societal expectations to maintain their reputation and operations. When companies engage in environmentally focused CSR activities, they demonstrate their commitment to the well-being of society and the planet. This commitment strengthens society's trust and support toward the company, providing additional incentives for companies to continuously conduct green innovations (Javeed et al., 2022). In other words, the drive to maintain social legitimacy can motivate companies to adopt and develop green innovation as an integral part of their business strategy.

Effect of ownership concentration on green innovation

This study's results indicate that ownership concentration does not affect green innovation. Thus, hypothesis four (H4) is rejected. This finding does not align with the concept of agency theory, which states that to eliminate agency problems, corporate managers can encourage corporate environmental strategies for green innovation (Javeed et al., 2022).

Research shows that although controlling shareholders have the power to influence management decisions, they may focus on short-term profits rather than long-term investments such as green innovation, which require significant resources and time. According to the agency theory, controlling shareholders can reduce agency problems by monitoring management more effectively. However, they may also pursue self-interests that are not always aligned with green innovation goals. These reasons may explain why only 58% of the companies sampled in this study implemented green innovation. This conflict of interest may lead companies to ignore or reduce investments in green innovation, as controlling shareholders may not see the immediate short-term financial benefits of innovation. Therefore, despite the potential for greater control, ownership concentration does not necessarily encourage investments in green innovation.

The impact of green innovation on financial performance

This study's results indicate that green innovation negatively affects a company's financial performance. Therefore, the fifth hypothesis (H5) is rejected. This result may be due to the high implementation costs and risks associated with these innovations. In the short term, green innovation investments often require significant expenditures for research and development,

the purchase of new equipment, and employee training. These significant start-up costs can reduce a company's profitability. In addition, green innovation is often risky due to uncertainties about the success of the new technologies and market acceptance (Wu et al., 2024). If the innovation does not have the expected impact, the company may suffer significant financial losses and negatively impact the company's market value in the short term (Z. Xie et al., 2022).

Although green innovation can enhance a company's social legitimacy in the long term, there may be a mismatch between stakeholder expectations and results in the short term. Investors and other stakeholders tend to expect quick results from green innovation, while the benefits of green innovation tend to emerge over the long term. If companies cannot demonstrate immediate improvements in financial performance, this can lead to dissatisfaction among shareholders and other stakeholders, reducing their confidence in the company. This loss of confidence can affect the company's perceived value, leading to lower share prices and increased market volatility. Thus, although green innovation aims to enhance social legitimacy and long-term sustainability, based on the legitimacy theory, the financial challenges and associated risks may reduce shareholder value in the short term.

The effect of corporate social responsibility (CSR) on financial performance mediated by green innovation

Green innovation can mediate the positive relationship between corporate social responsibility (CSR) and company value. Thus, the sixth hypothesis (H6) in this study is accepted. This result shows that CSR efforts integrated with green innovation help companies gain legitimacy from stakeholders. Based on the legitimacy theory, companies need society's support and approval to operate sustainably. When companies adopt green innovation, they demonstrate their commitment to environmentally responsible business practices. Such practices enhance the company's positive image and reputation in the public's eyes (Chouaibi et al., 2022). This positive image increases investor and consumer confidence and enhances competitiveness by attracting wider market interest in the company's products and services (Bonsu et al., 2024). As a result, green innovation can amplify CSR's positive impact on company value by enhancing its legitimacy and reputation.

Although the direct impact of green innovation may reduce financial performance in the short term due to the high costs and risks associated with developing new technologies, the positive mediating effect of green innovation remains strong in the long term. Successful green innovation can create operational efficiencies, reduce energy and waste costs, and create new market opportunities. In addition, companies that engage in green innovation often receive government incentives, regulatory support, and reputational benefits that can improve their competitiveness. Therefore, despite the short-term negative impacts, green innovation can mediate the positive impact of CSR on company value in the long run by helping companies adapt to increasingly stringent environmental requirements and improve their operations' sustainability.

The effect of ownership concentration on financial performance mediated by green innovation

The regression analysis revealed that green innovation has a small mediating effect on the relationship between ownership concentration and financial performance. Thus, the seventh hypothesis (H7) is rejected. This result contradicts previous research by Asni and Agustia (2022), which states that ownership concentration can affect green innovation, leading to improved company financial performance. This result may be because majority shareholders have different priorities or do not understand the importance of green innovation in the long run. The controlling shareholders may focus more on short-term profits and ignore

long-term investments, such as green innovation, which requires high initial costs and involves more uncertainty.

Although green innovation can improve a company's image and efficiency, its direct financial benefits may be unclear and cannot be measured immediately, reducing its attractiveness to shareholders seeking quick returns. Therefore, management, acting as agents, may be reluctant to allocate resources to green innovation if it is not fully supported by the majority shareholders, hindering the positive impact of green innovation on financial performance. In addition, from the legitimacy theory perspective, if majority shareholders do not consistently support green innovation practices, the company will not gain legitimacy from external stakeholders, which is necessary for improving a company's reputation and financial performance. Thus, the lack of support or effective management by controlling shareholders may hinder the positive impact of green innovation, such that ownership concentration does not significantly affect financial performance.

Robustness Test

This study adds control variables in the form of company size in substructures 1 and 2 to ensure the strength and consistency of the research model. The addition of this variable aims to test the robustness of the model used. The company size was measured by the natural logarithm of total assets, as done by Yuniarti et al. (2022). This method was chosen because it can provide a more accurate picture of company size and value and help reduce the bias that may occur due to differences in scale between companies.

Table 17. Robustness Test Results for Substructure 1

Dependent Variable: M
Method: Panel EGLS (Cross-section random effects)
Date: 07/26/24 Time: 09:54
Sample: 2020 2023
Periods included: 4
Cross-sections included: 20
Total panel (balanced) observations: 80
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.293238	0.993864	-0.295048	0.7688
X1	0.236913	0.080591	2.939694	0.0043
X2	0.219169	0.156975	1.396200	0.1667
Z1	0.021580	0.032157	0.671073	0.5042

Effects Specification		
	S.D.	Rho
Cross-section random	0.155685	0.7322
Idiosyncratic random	0.094145	0.2678

Weighted Statistics			
R-squared	0.153540	Mean dependent var	0.169308
Adjusted R-squared	0.120127	S.D. dependent var	0.099854
S.E. of regression	0.093664	Sum squared resid	0.666748
F-statistic	4.595239	Durbin-Watson stat	1.529377
Prob(F-statistic)	0.005209		

Source: Output E-views 12, 2024

Table 18. Comparison of Results with and without Substructural Control Variable 1

	Without Control Variables		With Control Variables	
	X1	X2	X1	X2
Coefficient	0.254293280788	0.195798512253	0.236913006484	0.219168857885
Adj. R-squared	0.126		0.120	
F-statistic	6.72		4.60	
Prob.	0.0014	0.1938	0.0043	0.1667

Source: Compiled by the Author, 2024

Estimation results without the control variable
M = 0.37002374314 + 0.254293280788*X1 + 0.195798512253*X2 + [CX=R]

Estimation results with the control variable
M = -0.29323756274 + 0.236913006484*X1 + 0.219168857885*X2 + 0.0215796439617*Z1 + [CX=R]

The coefficient value, adj. R-squared, F-statistic, and probability do not change significantly between before and after adding the control variables. This result indicates that substructure model 1's results are robust.

Sub Structure 2

Table 19. Robustness Test Results of Substructure 2

Dependent Variable: Y
Method: Panel Least Squares
Date: 07/26/24 Time: 09:57
Sample: 2020 2023
Periods included: 4
Cross-sections included: 20
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.448535	1.538662	1.591341	0.1172
X1	0.011260	0.073474	0.153252	0.8788
X2	-1.051459	0.268406	-3.917412	0.0002
M	-0.208859	0.108299	-1.928543	0.0589
Z1	-0.042557	0.051052	-0.833610	0.4080

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.866353	Mean dependent var	0.469750
Adjusted R-squared	0.811462	S.D. dependent var	0.177279
S.E. of regression	0.076976	Akaike info criterion	-2.047318
Sum squared resid	0.331818	Schwarz criterion	-1.332710
Log likelihood	105.8927	Hannan-Quinn criter.	-1.760812
F-statistic	15.78324	Durbin-Watson stat	1.672040
Prob(F-statistic)	0.000000		

Source: Output E-views 12, 2024

Table 20. Comparison of Results With and Without Substructural Control Variables 2

	Without Control Variables			With Control Variables		
	X1	X2	M	X1	X2	M
Coefficient	0.00188320407107	1.06107274542	0.227592038755	0.0112600268433	1.05145888851	0.0425570695651
Adj. R-squared		0.812			0.811	
F-statistic		16.557			15.783	
Prob.	0.9791	0.0002	0.0355	0.1172	0.0002	0.0589

Source: Compiled by the Author, 2024

Estimation results without control variables
Y = 1.17217625799 - 0.00188320407107*X1 - 1.06107274542*X2 - 0.227592038755*M + [CX=F]

Estimation results with control variables
Y = 2.4485354816 + 0.0112600268433*X1 - 1.05145888851*X2 - 0.208858699133*M - 0.0425570695651*Z1 + [CX=F]

The coefficient value, adj. R-squared, F-statistic, and probability do not change significantly between before and after adding the control variables. This result indicates that substructure model 2's results are robust.

MANAGERIAL IMPLICATION

The study provides several practical implications for managers and company executives. It underscores the necessity of fostering a strong commitment to CSR and green innovation, as these elements can enhance a company's market reputation and investor confidence. Companies are also encouraged to educate majority shareholders about the importance of sustainable practices and long-term investments in green innovation. This approach can align shareholder interests with the company's sustainability goals, potentially leading to improved financial performance. Managers should also consider balancing short-term financial gains with long-term sustainability initiatives, as this balance is crucial for the company's overall success and legitimacy in the eyes of stakeholders.

CONCLUSION

This study concludes that corporate social responsibility (CSR) can improve the implementation of green innovation. However, CSR does not significantly improve financial performance. Moreover, ownership concentration does not significantly improve the implementation of green innovation and can reduce a company's financial performance. Meanwhile, corporate social responsibility (CSR) can indirectly improve the company's financial performance through the mediating role of green innovation. Although green innovation can reduce financial performance, consistent green innovation will help CSR implementation to improve financial performance. Effective CSR can improve corporate reputation and investor confidence, increasing company value. Conversely, ownership concentration has no significant effect on financial performance through the mediation of green innovation. This result may be due to the controlling shareholder's different priorities and understanding of the importance of long-term investment in green innovation.

This study can help companies to become more involved in their CSR efforts and green innovation developments. It also encourages companies to educate their controlling shareholders about the importance of sustainable business operations without sacrificing the company's financial performance in the long run.

Nevertheless, this study has several limitations, such as a sample that is limited to the basic materials and energy sectors in Indonesia. Additionally, this study used content analysis to measure CSR and green innovation, which may lead to differences in thinking among other researchers.

Further research can expand the sample coverage by including companies from other sectors to determine whether the same findings apply in different sectors. Future research can also use different indicators or proxies to measure CSR and green innovation variables. Conducting research over a longer period can also provide a more complete picture of green innovations and CSR's impact on companies' financial performance. ■

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