

“Green perspective on intellectual capital, corporate social responsibility, and competitive advantage: The role of firm performance”

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GREEN PERSPECTIVE ON INTELLECTUAL CAPITAL, CORPORATE SOCIAL RESPONSIBILITY, AND COMPETITIVE ADVANTAGE: THE ROLE OF FIRM PERFORMANCE

Abstract

Green economy issues can occur both in the external and internal environment of business entities in terms of intellectual capital activities, social responsibility, and competitive advantage. This study aims to examine the relationship between intellectual capital, corporate social responsibility, firm performance, and competitive advantage through the mediating role of firm performance from a green perspective. Data were collected from annual reports accessed through the official Stock Exchange websites in each respective research country. The number of samples used is 60 sample data from pharmaceutical companies in Indonesia, Malaysia, and Singapore. Data analysis is carried out using multiple linear regression, path analysis, and Sobel test. This study shows that green intellectual capital, corporate social responsibility, and firm performance have a significant effect on green competitive advantage. Green intellectual capital and green corporate social responsibility have a significant effect on firm performance. Regarding mediating relationships, the results showed green intellectual capital and corporate social responsibility can increase green competitive advantage through firm performance. This shows that a company manager should pay attention to improving intellectual capital capability and corporate social responsibility because they have been proven to improve firm performance and competitive advantage in the context of green economy issues.

Keywords

environment, green accounting, intangible assets, intellectual capital, social responsibility

JEL Classification

L21, M14, M41

INTRODUCTION

This study was conducted based on two important issues: increasing the role of managing intangible assets in the form of intellectual capital (IC) and environmental issues that show the important role of corporate social responsibility (CSR) in the green economy era (Qurashi et al., 2020).

However, the facts show that many pharmaceutical company managers in Indonesia still do not understand the importance of the role of IC and have not been able to optimize the role of human capital (HC), structural capital (SC), and relational capital (RC). As a result, pharmaceutical companies in Indonesia are only able to compete for 17% of the Southeast Asian market (Hermawan et al., 2020a). In addition, there are still few pharmaceutical companies in Southeast Asia that disclose information about intellectual capital (IC) components in their financial reports (Hermawan & Milanetty, 2018). Information

about SC is often disclosed. Likewise, many research results show the important role of human capital (HC) in optimizing IC, especially for company performance and competitive advantage.

The second important issue in this study is the environment. The concept of environmental care applied by companies can help them improve their performance and competitiveness because the environment is one of the factors that supports the success of a company's business activities (Diebold & Porter, 1990). The study's novelty is demonstrated by analyzing tangible and intangible aspects and their relationship with GIC, GCSR, firm performance, and GCA.

1. LITERATURE REVIEW AND HYPOTHESES

This study uses two basic theories, resource-based theory for intellectual capital and stakeholder theory for corporate social responsibility (Freeman et al., 2021). Resource-based theory (RBT) states that a company will operate well if it has a competitive advantage that is able to create value for the company (Kamaluddin & Rahman, 2013; Wernerfelt, 1984). Competitive advantage is a quality that is inherent to a company and is difficult for competing businesses to imitate. By using and controlling its resources effectively, a company can gain a competitive advantage. Therefore, a company must be able to properly manage all its assets, personnel skills, technological expertise, organizational procedures, and knowledge that are useful for implementing company plans to increase business effectiveness and efficiency. The goal of stakeholders' efforts to manage organizational resources is to improve their well-being (Freeman et al., 2021). The higher the return an organization produces, the higher its ability to fulfill welfare. Competitive advantage includes abilities, skills, expertise, and information that are valuable to the company. With this competitive advantage, companies can compete and survive in the market and increase wealth, known as intellectual capital. A company will be better than other companies if it can utilize the intellectual capital it has. Resource-based theory emphasizes that competitive advantage can be achieved if a company is able to manage its resources effectively so that it can produce value for the organization. Intellectual capital includes all factors that influence financial performance.

Financial performance is part of company performance. High-performing companies will provide benefits to shareholders and other stakeholders.

There are various financial performance indicators, one of which is the return on assets (ROA) (Sujud & Hashem, 2017). Competitive advantage shows a company's ability to generate value as a result of managing its resources (Yunus & Sijabat, 2021; Hermawan et al., 2020b). The ability to consistently outperform industry averages in terms of return on investment can increase a company's competitive advantage. A company can gain market share by innovating in a way that differentiates it from its competitors. This is known as having a competitive advantage. A company with high performance will increase the competitive advantage of the product or company.

Many environmental problems that occur in Southeast Asia have caused the government, society, and companies to finally pay attention and take serious action by coming up with several solutions (Yusof & Aminuddin, 2019). Recognizing its significant contribution to environmental damage, the company strives to manage its intellectual property well and innovate as much as possible, especially those related to the environment. Thus, this inadvertently creates market competition. Customers with a high level of environmental awareness will be more interested in purchasing products from companies that support environmental values. As a result, many companies do this not only as a form of responsibility towards natural resources for the continuity of their business but also as a form of competition to become market leaders by increasing their competitive advantage (Alam & Islam, 2021). One of the company's strategies in an effort to achieve competitive advantage is to implement a culture of environmental care in the organization. The concept of green competitive advantage (GCA) describes the characteristics of being inimitable and reaching a superior point compared to competitors because the company holds a po-

sition of ecological management and sustainable innovation. Smart companies will implement this ecological program to achieve environmentally friendly competitiveness.

Effective resource management determines a company's success. The unique character of each company is demonstrated through its various resource management techniques, thereby providing a competitive advantage that can boost company value. Companies today need to integrate environmental protection concerns into resource management. Green intellectual capital is one strategy for combating the tendency of environmental conservation. Green intellectual capital is an intangible resource made up of expertise, know-how, innovation, and environmental protection laws. The use of green intellectual capital is crucial for businesses looking to improve their reputation, cut expenses, and protect the environment. In addition, with more environmentally friendly production processes and the application of science and services, companies will be able to compete in the market.

Many accounting problems occur when determining how to measure intellectual capital and report it in financial statements. One of the major problems faced by the modern economy is the measurement of intellectual capital. Traditional accounting practices prioritize physical assets while largely ignoring intellectual capital assets. Although the magnitude of IC's contribution cannot be displayed in traditional financial reports, this study intends to provide evidence that IC management is a worthy investment for companies because it can improve company performance and competitive advantage (Hermawan et al., 2020a; Lastanti & Augustine, 2022). Customers who have high environmental awareness will be more interested in purchasing products from companies that support environmental values. Meanwhile, with green intellectual capital, companies can achieve a competitive advantage (Bombiak, 2023). Based on the results of previous research, green intellectual capital, which includes the components of green human capital, green structural capital, and green relational capital, can increase competitive advantage (Mehmood & Hanaysha, 2022). The results of previous research also show that intellec-

tual capital has a large and profitable influence on competitive advantage (Rezaei et al., 2016). However, other research shows different results that the GIC components of structural capital and relational capital increase competitive advantage, while human capital reduces competitive advantage.

A company's social obligations to stakeholders regarding the impacts resulting from its operational activities are reflected in the implementation of corporate social responsibility (CSR). Companies' efforts to implement CSR can give them a competitive advantage. However, not all companies that implement CSR care about the environment. Implementing green CSR will indirectly provide added value for the company. Previous research results show that CSR significantly influences competitive advantage (Angio et al., 2022). This indicates that a company's disclosure of its green CSR can boost its competitive advantage because it sets itself apart from rivals. In addition, the results of previous research also show that green corporate social responsibility (GCSR) can achieve a competitive advantage by utilizing resources to invest in GCSR. However, Alam and Islam (2021) inform that GCSR does not affect company value which is closely related to increasing company performance. Corporate social responsibility can increase competitive advantage. Traditional financial reports do not provide the information investors need to understand a company's resources that can create value in the future.

Companies are increasingly aware of the importance of protecting the environment because of its impact on the sustainability of life. Stakeholders always think that green intellectual capital can improve firm performance. Company performance based on environmental care can increase consumer interest in buying the company's products. Therefore, if a company can manage and use its intellectual capital effectively, its financial performance will also be good. Intellectual capital is an important factor that influences company performance, which contributes to a sustainable economy and improves environmental quality (Zhilenkova et al., 2019). According to Chandra and Augustine (2019), green intellectual capital can increase a company's financial performance. In addition, Hermawan et al. (2019) and

Hermawan and Nurasik (2020) also state that intellectual capital can improve significantly financial performance. Green intellectual capital is an intangible asset that must be developed in value-added activities to improve company performance.

Companies use green corporate social responsibility (GCSR) because they have to balance the economic, environmental, and social aspects of their operations. Customers will prefer to buy goods from businesses that are socially and ecologically responsible rather than from businesses that ignore this (Adeneye & Ahmed, 2015). A company strives to be responsible for environmental sustainability by improving the environment that has been exploited. The higher the number of customers, the higher the company's sales and profitability will be, leading to increased performance and investor interest (Mehmood & Hanaysha, 2022). Therefore, CSR programs are important for the business world. Corporate social responsibility has a profitable and large impact on business performance (Wedysiage et al., 2021). This means that when a company discloses its green CSR, it can improve company performance due to high sales and profits (Freeman & Dmytriiev, 2020). A company's concern for social responsibility can increase public trust, which in turn increases sales of the products and services it offers, thereby increasing the company's competitive advantage (Alam & Islam, 2021; Mehmood & Hanaysha, 2022). Investors' trust in companies that care about social and environmental responsibility will increase, because investors support the company's funding needs to improve company performance. Implementing environmentally friendly corporate social responsibility can improve performance, ultimately increasing the company's environmentally friendly competitive advantage.

Competitiveness can be achieved with green intellectual capital (Bombiak, 2023). This concept requires companies to better integrate the three components of the company in the environment, including human capital (HC), structural capital (SC), and relational capital (RC) (Zhilenkova et al., 2019). In the concept of human capital (HC), for example, a company should emphasize its employees or human capital to care about the environment. Relational capital (RC) should also cre-

ate environmentally friendly marketing media. By applying the concepts of green intellectual capital (GIC) and green corporate social responsibility (GCSR), companies will be able to increase their green competitive advantage (GCA) both directly and through firm performance.

The use of firm performance as a mediating variable is based on the rationale of optimizing human resources that care about the environment, a work environment, and corporate social responsibility activities that support the concept of a green economy, and advertising of non-smoking products is an excellent example of green intellectual capital management for companies (Chang & Chen, 2012). If a company is able to optimize the role of green intellectual capital and green corporate social responsibility, it will certainly get sympathy and goodwill from stakeholders that have an impact on firm performance. Product sales will increase, and profits increase which will eventually be used to increase the green competitive advantage (Astuti & Datrini, 2021; Rezaei et al., 2016; Shehzad et al., 2022).

This study aims to investigate the relationship between green intellectual capital, corporate social responsibility, firm performance, and competitive advantage through the mediating role of firm performance in pharmaceutical companies. The hypotheses can be formulated as follows:

- H_1 : *Green intellectual capital has a significant effect on green competitive advantage.*
- H_2 : *Green corporate social responsibility has a significant effect on green competitive advantage.*
- H_3 : *Green intellectual capital has a significant effect on firm performance.*
- H_4 : *Green corporate social responsibility has a significant effect on firm performance.*
- H_5 : *Firm performance has a significant effect on green competitive advantage.*
- H_6 : *Green intellectual capital has a significant effect on green competitive advantage through firm performance.*

H₇: Green corporate social responsibility has a significant effect on green competitive advantage through firm performance.

2. METHOD

This study is quantitative. Data were collected from annual reports accessed through the official Stock Exchange websites in each respective research country. The samples used in this study are pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) with 6 companies, the Kuala Lumpur Stock Exchange (KLSE) with 5 companies, and the Singapore Exchange (SGX) with 1 company. Sampling is carried out using a purposive sampling technique with the following criteria:

- 1) Pharmaceutical companies listed on the stock exchange in Southeast Asia;
- 2) Publishing annual reports on the stock exchange or each company's website;
- 3) The necessary data related to this study are available in full. This study uses green intellectual capital and green corporate social responsibility as independent variables, green competitive advantage as a dependent variable, and company performance as a mediating variable.

Based on the criteria obtained, company data as a sample were obtained (Table 1).

Table 1. List of sample companies

No.	Code	Company	Country
1	KLBF	Kalbe Farma Tbk.	Indonesia
2	DVLA	PT Darya-Varia Laboratoria Tbk	Indonesia
3	KAEF	Kimia Farma, Tbk	Indonesia
4	MERK	PT Merck Tbk	Indonesia
5	PYFA	PT Pyridam Farma Tbk	Indonesia
6	TSPC	Tempo Scan Pacific Tbk	Indonesia
7	APEX	Apex Healthcare Berhad	Malaysia
8	AZN	AstraZeneca	Malaysia
9	DUOP	Duopharma Biotech Berhad	Malaysia
10	NOVN	Novartis	Malaysia
11	YSPSAH	Y.S.P. Industries (M) Sdn. Bhd	Malaysia
12	HAWPF	Haw Par Corporation Ltd	Singapore

Green intellectual capital (GIC) is a combination of environmental concepts with intellectual capital to improve environmental conditions. The measurement of green intellectual capital refers to a study by Chandra and Augustine (2019), which uses the content analysis method in annual reports. Each component disclosed by a company will receive a score of 1, while each component that is not disclosed will receive a score of 0. Green corporate social responsibility (GCSR) is an acknowledgment of obligations aimed at reducing waste, increasing input efficiency, and minimizing negative impacts arising from the company's operational activities. Green CSR is measured using 13 project metrics from a company's disclosure instrument which will be given a score of 1 if disclosed and 0 if not disclosed (Wu et al., 2018). Green competitive advantage (GCA) is a scenario where a company's position in green innovation and environmental management cannot be imitated by competitors, thus providing benefits for the company's sustainability. The measurement uses an index consisting of 8 indicators that refer to a study conducted by Chen (2011). Each component disclosed by the company will get a score of 1 and a score of 0 or vice versa. In this study, firm performance (FP) is measured using the return on assets ratio (ROA). The data analysis techniques used are multiple linear regression analysis, path analysis, and Sobel test analysis with software application (SPSS).

3. RESULTS

Table 2. Normality test

Dependent variable	FP	GCA
	Unstandardized Residual	Unstandardized Residual
N	60	60
Test Statistic	.107	.074
Asymp. Sig. (2-tailed)	.083 ^c	.200 ^{c,d}

Based on the results of the normality test (see Table 2), the values of Asymp Sig. (2-tailed) in both regression models are 0.083 and 0.200, respectively, or greater than 0.05. This means that the data are normally distributed.

Table 3. Multicollinearity test

Dependent variable	Independent variable	Tolerance Value	VIF Value
FP	GIC	0.413	2.421
	GCSR	0.413	2.421
GCA	GIC	0.255	3.914
	GCSR	0.390	2.565
	FP	0.299	3.347

All independent variables have a tolerance value of ≥ 0.10 and a VIF value of ≤ 10 , which means that there is no multicollinearity between variables in this study (see Table 3).

Table 4. Autocorrelation test

Dependent variable	Durbin-Watson statistics
FP	1.676
GCA	2.038

The Durbin-Watson values of $1.6518 < 1.676 < 2.3482$ and $1.6889 < 2.038 < 2.311$. This means that there is no autocorrelation between independent variables (see Table 4).

Table 5. Heteroscedasticity test

Dependent variable	Independent variable	Sig.
FP	GIC	0.237
	GCSR	0.371
GCA	GIC	0.742
	GCSR	0.621
	FP	0.524

The regression model in this study does not have heteroscedasticity because each variable has a significance value > 0.05 (see Table 5).

Table 6. Multiple linear regression analysis – Model 1

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	-.050	.004	-	-11.874	.000
	GIC	.324	.015	1.066	21.549	.000
	GCSR	-.029	.011	-.128	-2.597	.012

Note: a. Dependent Variable: FP.

Table 7. Multiple linear regression analysis – Model 2

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	-.351	.054	-	-6.482	.000
	GIC	1.730	.078	1.015	22.130	.000
	GCSR	.114	.047	.091	2.453	.017
	FP	-.026	.009	-.125	-2.953	.005

Note: a. Dependent Variable: GCA.

The multiple linear regression analysis in this study is carried out in two models. Regression model 1 places company performance as the dependent variable and green intellectual capital and green corporate social responsibility as independent variables. Regression model 2 places green competitive advantage as the dependent variable and green intellectual capital, green corporate social responsibility, and corporate performance as the independent variables.

Based on the calculation in Table 6, the multiple regression equation is as follows:

$$Z = -0.050 + 0.324 X_1 - 0.029 X_2, \quad (1)$$

Green intellectual capital (GIC) has a significant effect on firm performance (FP) with a significant value of $0.000 < 0.05$. The value of 0.324 indicates a positive relationship between green intellectual capital and company performance. A positive relationship indicates that the higher the green intellectual capital variable, the greater the firm performance. Green corporate social responsibility has a significant effect on firm performance with a significant value of $0.012 < 0.05$, the value of green corporate social responsibility is -0.029 . The negative value shows the opposite influence, in which if the green corporate social responsibility is high, the firm performance will decrease.

Green intellectual capital (GIC), green corporate social responsibility (GCSR), and firm performance (FP) have a significant effect on green competitive advantage (GCA) because they have a significant value < 0.05 (see Table 7).

Table 8. Test for coefficient of determination

Dependent variable	R-Squared	Adjusted R-Squared	Model
FP	0.942	0.940	Model 1
GCA	0.970	0.968	Model 2

The Adjusted R-squared value in model 1 is 0.940, which means that the firm performance variable is influenced by green intellectual capital and green corporate social responsibility by 94% and influenced by other variables by 6% (see Table 8). Meanwhile, the Adjusted R-squared value in model 2 is 0.968, which means that the variable of green competitive advantage is influenced by green intellectual capital, green corporate social responsibility, and firm performance by 96.8% and influenced by other variables by 3.2%. Figure 1 shows the research model through analysis of the SPSS output results in the multiple linear regression analysis.

Table 9. Results of calculation of direct and indirect influences

Influence of Variables	Influence of Variables	Indirect Influence	Total Influence
X ₁ → Z	1.066	–	1.066
X ₁ → Y	1.015	–0.133	0.882
Z → Y	–0.125	–	–0.125
X ₂ → Z	–0.128	–	–0.128
X ₂ → Y	0.091	0,016	0.107

A mediating effect can be shown if the t count value > t table. Table 9 shows that the t count value is –13.6297 or greater than the t table value with a significance level of 0.05, which is 2.0017. So, it can be concluded that the value of the indirect influence of –0.133 is significant, which means that firm performance can mediate the effect of green intellectual capital on green competitive advantage (Muthahharah & Mar’ah, 2024).

The mediation test (indirect effect) of firm performance variable (Z) on the effect of green corporate social responsibility variable (X₂) on green competitive advantage (Y) can be calculated by Sobel’s (1982) formula:

$$Sab = \sqrt{(b^2 Sa^2) + (a^2 Sb^2) + (Sa^2 Sb^2)}, \tag{1}$$

$$Sab = \sqrt{\left((-0.125)^2 (0.011)^2\right) + \left((-0.128)^2 (0.009)^2\right) + \left((0.011)^2 (0.009)^2\right)} = 0.0018, \tag{2}$$

Find t_{count} :

$$t_{count} = \frac{a \cdot b}{Sab}, \tag{3}$$

$$t_{count} = \frac{(-0.128) \times (-0.125)}{0.00179652999} = 8.9061. \tag{4}$$

The t_{count} value of 8.9061 is greater than the t_{table} value with a significance level of 0.05, which is 2.00172. So, it can be concluded that the value of the indirect influence of 0.016 is significant, which means that firm performance can mediate the effect of green corporate social responsibility on green competitive advantage.

4. DISCUSSION

The results prove that green intellectual capital and green corporate social responsibility influ-

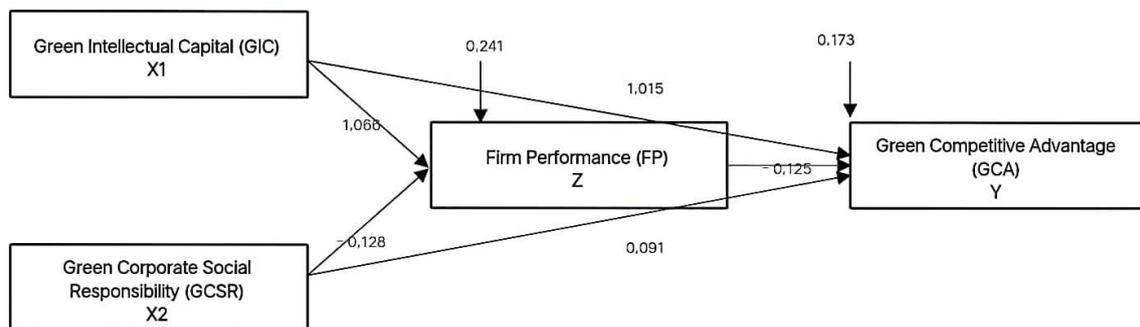


Figure 1. Research model test result

ence green competitive advantage either directly or indirectly through firm performance. The findings show that building green human resources, green structural capital, and green relational capital can improve the corporate performance and competitive advantage of pharmaceutical companies. To improve company performance, pharmaceutical companies in Southeast Asia must be able to develop intangible resources such as staff knowledge, experience, education, skills, databases, information systems, organizational culture, successful marketing, patents, and brand image. Pharmaceutical companies should explicitly build green human resources in the green economy era (Shoaib et al., 2021). Additionally, pharmaceutical companies need to invest in green infrastructure, such as smoke-free workplaces, safe production waste, and ecologically friendly production (Chen & Chang, 2012). Green relational capital includes positive relationships with clients and green marketing (Anik & Sulisty, 2021; Shehzad et al., 2022).

Green corporate social responsibility influences green competitive advantage either directly or indirectly through firm performance (Pratama & Fitri, 2021). The implementation of corporate social responsibility reflects a company's social responsibility to stakeholders for the impact coming from its operational activities CSR initiatives undertaken by businesses can give them a competitive advantage (Mehmood & Hanaysha, 2022). Not all companies that carry out corporate social responsibility are environmentally conscious. However, adopting corporate social responsibility that is concerned with the environment will indirectly provide added value to the business world in order to build superior competitive advantages so that they are able to survive and compete in a time of increasing environmental concern.

This study adds to knowledge about resource-based theory, intellectual capital, firm performance, and competitive advantage. These four study themes are connected in several studies (Radjenovic & Krstic,

2017). Sales value, customer happiness, profits, company value, and competitiveness in the same industry and in the external environment will increase if the company is able to manage its intellectual capital well. A company will be able to adapt to an unstable environment if it is able to utilize its resources in the form of intangible assets in the green economy era.

This study also puts forward the widely accepted stakeholder theory which is related to corporate social responsibility (Freeman & Dmytriiev, 2020). Corporate social responsibility initiatives are essentially management's way of answering questions from internal and external stakeholders. Companies that care about the environment and make positive contributions to the environment will benefit from the purchase of goods and services by stakeholders, the good name given to them, and the satisfaction of employees and customers, which will ultimately improve their performance and competitiveness. This means that stakeholders will reward companies for adopting policies that support the environment by improving their performance and competitiveness in the global economy.

This study provides useful benefits for pharmaceutical company managers by showing that strong intellectual capital management leads to high corporate performance and competitiveness. This is important considering that one of the industries that has high intellectual capital-intensive characteristics is the pharmaceutical industry (Hermawan et al., 2019). The reason is that the pharmaceutical industry is a knowledge-intensive industry with a high level of research and innovation compared to other industries. In this case, pharmaceutical companies must be able to manage intellectual capital. Pharmaceutical businesses engage in extensive research, innovation, knowledge usage, human-technology interaction, and reliance on intellectual capital as a source of rejuvenation. This study shows that intellectual capital can provide benefits to companies by increasing performance and competitiveness, although current accounting cannot recognize intangible assets such as intellectual capital contained in financial statements.

CONCLUSION

The purpose of this study is to find out the effect of green intellectual capital and green corporate social responsibility on green competitive advantage. In addition, this study investigates the role

of firm performance as a mediating variable. The results of this study show that all hypotheses are supported, which means that green intellectual capital and green corporate social responsibility, both directly and through firm performance, influence green competitive advantage. Firm performance can increase green competitive advantage. The conclusions of this study also show the seriousness and concern of pharmaceutical company managers in Southeast Asia towards environmentally friendly activities and provide credence to stakeholder theory and resource-based theory. This study supports several studies related to environmental friendliness and shows the importance of such studies.

The limitation of this study is that several pharmaceutical companies used as samples have not presented complete annual financial reports and integrated reporting on the stock exchange websites of each country. The aspect of caring behavior towards environmental hazards has not been analyzed in this study model to support the application of green intellectual capital. Environmental problems are widely highlighted, especially in the pharmaceutical industry and the mining industry. The mining sector is closely related to the exploitation of the environment and human resources. Therefore, it is recommended that further studies examine the same research model in the mining industry. It is possible to make modifications by testing aspects of behavior, employee motivation, and environmentally friendly knowledge as important independent variables.

The theoretical implications were that green intellectual capital expands the human resources management literature, which focuses on the behavior and attitudes of organizational members who do not only focus on achieving financial performance but also require environmentally friendly awareness and work behavior. This study has implications for expanding green intellectual capital in companies as a key factor that can improve human resources, company capabilities, economic success, company value, and financial performance so that they can maintain their competitiveness. The practical implication has shown that pharmaceutical companies in several Southeast Asian countries are currently committed to innovating environmentally friendly pharmaceutical products to support unsustainable production and sustainable consumption of medicines and food in the context of World Human Environment Day 2023. Medicines and food are commodities resulting from activities that can have an impact on the environment. In practice, pharmaceutical companies in Southeast Asia strive to maintain environmental sustainability in a company's business processes from upstream to downstream throughout the entire process, starting from the supplier selection process, production, formulation, filling, and packaging to handling finished products. The results of this study show that pharmaceutical companies are aware of the impact of their operations on the environment and implement beyond compliance standards through green intellectual capital activities in environmental management and the integration of environmentally friendly policies in all operational activities to improve company performance.

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