Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

Corporate environmental ethics as a catalyst: Strengthening green innovation for sustainable competitive advantage

Edi Sopyan[1], Magda Siahaan[2*], Theonino David Nauli[3], Hofandrik Lase[4]
Universitas Trisakti[1], Trisakti School of Management[2], Universitas Terbuka[3], Universitas Bung Karno[4]
edisopyan.interisti@gmail.com, mgd.ddm.z@gmail.com, theoninodavid489@gmail.com, hofandriklase02@gmail.com

*Corresponding Author
Submitted: Jan 25, 2026
Accepted: Feb 5, 2026
Published: Feb 5, 2026

ABSTRACT

This study empirically evaluates the influence of green intellectual capital, green innovation, and environmental management on green competitive advantage, with corporate environmental ethics as a moderating variable. The associative hypothesis-testing method was used on primary data from a survey, distributing questionnaires to all employees of 238 industrial companies and 30 industrial companies in Indonesia, using purposive sampling, and the data were analyzed using the SEM method in AMOS software. Achieving Green competitive advantage through environmentally conscious human resources, strong corporate ethics, green structural and relational capital management, and sustainable organizational culture, although integrated implementation, is still a challenge in Indonesia. This research implication Incorporates environmental ethics, cultivates sustainable human resources, executes sustainability strategies, and emphasises the triple bottom line to attain a green competitive advantage; furthermore, the government can facilitate this through incentives, regulations, and the promotion of environmental awareness.

Keywords: *Green competitive advantage, corporate environmental ethics, green intellectual capital, green innovation, environmental organizational management* ***JEL Classification*****:** *M410, Q560, O310*

INTRODUCTION

Global warming, with surface temperatures rising by 1.1°C and perhaps rising by 1.5°C in the twenty-first century, and the challenge of keeping warming below 2°C. That is caused by human activities, especially through greenhouse gas emissions. Human-induced climate change has impacted many extreme weather events and climates in every part of the world due to extensive and swift changes in the atmosphere, seas, cryosphere, and biosphere (IPCC, 2024). Environmental abuse has been worse during the previous 300 years, with the Industrial Revolution, urbanisation, and commercialisation of agriculture exacerbating the interaction between humans and the environment (Ramlogan, 1997). One of the human activities that threatens the ecological damage of the earth is the rapid development of extractive and exploitative development. This is consistent with research Tan and Cross (2012) which found that the huge and careless use of natural resources brought about by industry's acceleration of global development has harmed the environment. Therefore, it is very necessary to have an environmentally aware development concept as regulated in Law No. 23 of 1997 (PRI, 1997).

The phenomenon in Indonesia of environmental damage due to exploitation of natural resources from irresponsible business activities. The most famous example of environmental damage in Indonesia to date is the case of hot mud from PT. Lapindo Brantas which erupted to the surface in 2006 and still has an impact today. In addition, environmental damage due to mining by

PT. Freeport Indonesia (PTFI), Jayapura, was known in 2019. Environmental regulations and consumer environmentalism are two examples of the kinds of environmental pollution that have become more severe in recent decades, making it all the more urgent that stakeholders engage in environmentally sound management practices if we are to reverse the deterioration of our planet's natural landscape and ensure the survival of future generations (Chen, 2011). The company's perspective on international regulation has evolved, and the so-called "green" issue has transformed into a global initiative aimed at mitigating environmental deterioration. Nations worldwide have commenced promoting environmental protection and sustainable development (Huang & Kung, 2011).

Businesses can take advantage of environmental opportunities by adopting new "green" concepts in administration, including "green" production, marketing, accounting, innovation, design, etc. (Chang & Chen, 2013). Green management, also known as environmental management (EM), allows companies to improve their corporate image, establish new markets, and strengthen their competitive edge while also avoiding environmental objections or penalties. Green intellectual capital (GIC), which includes green human capital (GHC), green structural capital (GSC), and green relational capital (GRC), is one of the intangible assets that corporations rely on to get an edge in the modern information economy(Chang & Chen, 2012; Chen, 2008a) Chang & Chen, 2012. Chuang and Huang's (2015) study demonstrates that GIC, comprising GHC, GSC, and GRC, positively influences business competitive advantage. Companies that participate in EM and green innovation (GI) initiatives enhance their overall productivity, corporate reputation, and competitiveness in response to the trend of environmental consciousness, while also reducing production waste. For businesses that are trying to find a way to balance economic growth with environmental preservation, green innovation—also known as green products or processes—is a crucial tool for sustainable development. This includes innovations in energy efficiency, pollution prevention, waste recycling, green product design, and corporate environmental management (Chen *et al*., 2006, 2012). Organisations enhance their GI to bolster competitiveness in response to the evolving nature of green technology and the brief product life cycle (Tseng et al., 2013). According to Lin *et al*. (2014), GI entails significant market uncertainty and risk, with substantial resources expended in product and process development. Chen *et al*. (2006) demonstrated that GI, encompassing green product innovation (GPDI) and green process innovation (GPCI), positively impacts competitive advantage in enterprises within the information and electronics sector. Chang (2011) discovered that GPDI positively impacts competitive advantage, however GPCI does not.

Additionally, green management and EM (environmental organisational culture (EDC) and environmental leadership (EL)) are not only defence mechanisms to maintain legitimacy, but also the foundation of the organization's mission to achieve sustainable development. They identify proactive strategies and positive solutions to environmental issues by utilising innovative environmental technologies to capitalise on business opportunities through environmental improvement, thereby enhancing the effectiveness and efficiency of their environmental activities (Chang, 2011; Chen, 2008b, 2011). Chen (2011) discovered that environmental management positively influences green competitive advantage (GCA). Moreover, firms exhibiting strong environmental ethics typically enhance resource productivity via GI to offset environmental expenses and succeed in attaining sustainable growth (Chen *et al*., 2006; Chang, 2011). Consequently, corporate environmental ethics (CEE) can promote proactive environmental initiatives that enhance GI. Chang (2011) shown that CEE positively influences GCA. The positive influence is indirect, mediated by GPDI. However, Chen (2011) asserted that in light of stringent environmental regulations and heightened consumer environmental awareness, companies must not overlook their responsibilities, as these environmental challenges can be transformed into business opportunities that promote their environmental organisational identity, thereby enhancing the company's green competitive advantage. Berry and Rondinelli (1998) and Chen (2011) contend that firms engaging in EM and GI acquire a GCA, which their rivals are unable to replicate.

Based on these phenomena and concepts, this study empirically tested the impact of implementing green intellectual capital, green innovation, and environmental management on green competitive advantage, with corporate environmental ethics as a moderating variable. The research gap, a novelty in the field, is the scarcity of research on green competitive advantage

influenced by green intellectual capital, green innovation, and environmental management, with corporate environmental ethics as a moderating variable. The next stage discusses the theoretical background and literature review, followed by the methodology section, which presents the results and conclusions, and discusses implications and future research.

LITERATURE REVIEW

There are three theories underlying this research to form a model hypothesis, as shown in Figure 1, namely stakeholder theory (Freeman, 1984; Siahaan, 2025), beside legitimacy theory (Dowling & Pfeffer, 1975), and Resource-based view theory (RBV) (Barney, 1991). Stakeholder theory describes stakeholders as parties who legitimately have interests and intrinsic values in the company (Donaldson & Preston, 1995). Companies closely related to environmental pollution and damage will face external pressure from public opinion, and it isn't easy to integrate EM in accordance with stakeholder expectations if stakeholders have different interests than strategic objectives. Stakeholder theory pertains to strategic management, marketing, production, financial management, human resource management, research and development, organisational ethics, corporate governance, business performance, health management, and information technology systems management (Boubaker et al., 2014; Nauli & Mutiara, 2025; Siahaan et al., 2023a, 2024). Therefore, proactive EM implies that companies must solve environmental problems without prioritizing the interests of stakeholders (Boubaker *et al*., 2014).

Legitimacy theory explains that company performance will be considered fair and worthy of support if accepted by the social community, so it is closely related to company decisions regarding social and environmental issues (Eugénio *et al*., 2013). Legitimacy theory posits that managers utilise disclosure to influence stakeholder perceptions regarding the organisation's duties, responsibilities, and the degree to which the company meets those obligations. However, the legitimacy gap arises when public expectations of a company's behavior differ from public perceptions of its behavior (Deegan *et al*., 2002; Magness, 2006; Mohamed *et al.*, 2014; Siahaan *et al*., 2023b). The Resource-Based View (RBV) paradigm conceptualises a corporation as an assemblage of assets, resources (strategic, ordinary, and obsolete), and both tangible and intangible capabilities. It utilizes them optimally according to company goals (Swartz & Firer, 2005). Barney (1991) introduced RBV as something valuable, expensive resource and its ability to provide a sustainable competitive advantage. The constraints and deficiencies of the resource-based paradigm create chances for discovering innovative solutions in strategic management. Because by having resources that currently determine competitive positions, namely knowledge, skills, and technology, from the company's perspective will be very profitable (Otola *et al.*, 2013; Warnier *et al*., 2013).

Green competitive advantage

Green competitive advantage refers to a situation in which organisations hold distinct positions in EM or GI, rendering their successful environmental strategies inimitable by competitors, hence enabling them to derive sustainable benefits from these methods. Businesses shouldn't shirk their responsibilities in light of growing consumer concern for the environment and stringent environmental regulations; doing so could undermine their GCA (Chen, 2011; Chen & Chang, 2013; McWilliams *et al.*, 2006). A more positive outlook could lead to increased profits for businesses that actively promote environmental sustainability. GCA is a crucial element for firms to enhance their attainment of sustainable development. Nonetheless, diverse green knowledge frameworks must acknowledge the significant influence of product greenness, encompassing both green service innovation and green dynamic capabilities, as the green market continues to expand. Companies must adjust to the evolving market landscape to attain a GCA in business (Berry & Rondinelli, 1998; Lin & Chen, 2017).

Green intellectual capital and green competitive advantage

Intellectual capital is an intangible asset that is challenging to investigate or quantify directly (Cheng et al., 2010; Lusmeida & Siahaan, 2025). Chen (2008b) defines green intellectual capital by integrating the notion of green with intellectual capital to address prior shortcomings in

environmental matters. GIC is the sum of all intangible assets, information, skills, connections, etc. that are associated with GI or environmental preservation at the individual and organisational levels of a business (Chen, 2008b). Huang and Kung (2011) assert that GIC allows enterprises to adhere to stringent international environmental rules, address rising consumer environmental consciousness, and generate value for the organisation. GIC is defined as follows: 1) GHC—employees' environmental protection and innovation know-how, attitudes, talents, abilities, wisdom, imagination, and dedication; 2) GSC—the blueprints, authority, and enabling infrastructure for building sustainability strategies; and 3) GRC—the company's environmental management and innovation connections with its suppliers, customers, and other stakeholders. This concept is clarified by Chang and Chen (2012), Chen (2008b) and Huang and Kung (2011). Chen (2008b), Chuang and Huang (2015) and Huang and Kung (2011) conducted research that demonstrated that GHC, GSC, and GRC all contribute to the competitive advantage of the organisation.

H1a. GHC positively contributes to GCA
H1b. GSC positively contributes to GCA
H1c. GRC positively contributes to GCA

Green innovation and green competitive advantage

Green innovation encompasses hardware or software advancements that are associated with green products or processes. This includes advancements in technologies that are involved in energy conservation, pollution prevention, refuse recycling, GPDI, or corporate environmental management. Additionally, it means that green innovation is defined as inventions that help businesses reduce their environmental effect, meet environmental goals, and integrate environmental benefits (Aulia *et al*., 2025; Borah *et al.*, 2024; Lisnawati & Siahaan, 2025). GI in product design include methods aimed at mitigating adverse environmental effects throughout the product's life cycle, including the use of non-toxic raw materials, sustainable design, energy efficiency, pollution reduction, waste recycling, and waste minimisation. Conversely, GI from a process perspective refers to any modification in the manufacturing process that mitigates adverse environmental effects throughout the procurement, production, and distribution of materials, including energy conservation, pollution reduction, and waste recycling. Many companies regard corporate environmental management as an extraneous investment that may impede their development and progress. Conversely, certain prior research assert that pollution is unequivocal proof of wasteful resource use. Companies who pioneer in GI will be the first to benefit from this, allowing them to ask for higher pricing for green products while also improving their corporate image, developing new markets, and gaining a competitive advantage. Chang (2011) and Chen *et al.* (2006) emonstrated that GPCI positively influences competitive advantage.

H2a. GPDI positively contributes to GCA
H2b. GPCI positively contributes to GCA

Environmental management and green competitive advantage

Environmental management encompasses all activities aimed at mitigating the adverse effects of a company's operational activities on the environment throughout the product life cycle. This involves the integration of company resources and systematic methodologies to diminish negative impacts, thereby promoting proactive pollution prevention and continuous improvement in EM. Such efforts lead to enhanced corporate financial performance, including cost reductions, increased market profitability, greater financial outcomes, attraction of capital investment, and decreased industry insurance premiums (Chang, 2011; Chen, 2008a). Companies who invest extensively in EM not only avoid the problem of protests or fines for environmental protection, but also allow them to strengthen their corporate image, establish new markets, and enhance competitive advantage (Chen, 2008b), as well as their product differentiation advantage. EM is made up of two components: 1) EOC (which provides a symbolic context for environmental management and protection by guiding members' behaviour and sensing processes) and 2) EL. According to Chen's research (2011) EOC positively influences GCA. This was subsequently

corroborated by Chiou et al. (2011), who asserted that environmental performance and EL have a beneficial impact on competitive advantage.

H3. EM positively contribute to GCA

Corporate environmental ethics and competitive advantage

Ethics pertains not to morals per se, but rather to the alignment of traditional societal norms with prevailing human moral judgements, encompassing three fundamental paradigms: moral awareness, moral difficulties, and moral laxity (Tran, 2008). Steinmann (2008) maintains that corporate ethics is a dialogical concept that contributes to the public interest (and national law) by promoting peace within and between communities and resolving conflicts peacefully with corporate stakeholders that may arise (or have the potential to arise) as a result of the methods (strategies) that companies employ in pursuit of profit. In this role, corporate ethics introduces an additional dimension to the economic obligations of corporations that yield adequate profits for survival in competitive environments, specifically corporate social responsibility. Companies must adapt their plans and operations to align with environmental trends. One way that environmentally conscious businesses offset their expenses is by boosting resource productivity via GI (Chen *et al*., 2006). Integrating corporate ethics into the management process (planning, organising, staffing, directing, controlling) necessitates that the principle of "corporate ethical primacy" predominates over all business choices and actions, particularly in problematic situations, according to Steinmann (2008). Chang (2011) regards CEE as a form of exemplary company culture essential for attaining sustainable development. Consequently, the CEE of corporations can encourage proactive environmental initiatives that promote GI to achieve a competitive advantage (Chen *et al*., 2006). Chang's (2011) tudy demonstrates that CEE positively influences GCA. This beneficial effect is indirect as it is facilitated by GPDI.

H4. CEE positively contribute to GCA

The moderating role of corporate environmental ethics

Ethics are essential for sustaining positive interactions, particularly within the social group. The company has effectively implemented stakeholder theory and legitimacy theory by upholding ethics and fostering positive connections with stakeholders. The primary objective is to establish a distinctive value that competitors cannot replicate; in this instance, the value pertains to a sustainable competitive advantage. Corporate ethics regarding the environment will add value to the company in society, the value can be in the form of GCA. Therefore, CEE ethics will strengthen the positive influence of exogenous variables on the company's GCA. Without a good environmental ethics concept, it is difficult for employees to understand the management of the surrounding environment as well and a good structure without ethics that regulates it will be in vain because the company must understand the concept of ethics that applies in society.

H5a. CEE have a positive moderating effect on the relationship between GHC and GCA
H5b. CEE have a positive moderating effect on the relationship between GSC and GCA
H5c. CEE have a positive moderating effect on the relationship between GRC and GCA
H5d. CEE have a positive moderating effect on the relationship between GPDI and GCA
H5e. CEE have a positive moderating effect on the relationship between GPCI and GCA
H5f. CEE s have a positive moderating effect on the relationship between EOC and GCA
H5g. CEE have a positive moderating effect on the relationship between EL and GCA

This study aims to address the research gap in the existing literature and develop a new conceptual framework that explores the role of corporate environmental ethics in a company's green strategy. While existing research examines the role of various factors in enhancing green competitive advantage, no studies have examined the direct influence of corporate environmental ethics on it. There is research on its positive indirect influence mediated by green product innovation. A moderating effect of corporate environmental ethics in strengthening the relationships among green human capital, green structural capital, green relational capital, green product innovation, green process innovation, environmental organizational culture, and environmental leadership has also not been found. The direct influence of CEE on GCA is important because it establishes a firm's internal ethical foundation that drives intrinsic

Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

sustainability commitment, enabling rapid responses to environmental regulations, stakeholder pressures, and green market trends without depending on intermediaries such as green product innovation, which can be delayed or costly. Without direct influence, the model captures only limited indirect effects; this new research provides empirical evidence in a high-environmental-risk industry, supporting an ethical integration strategy for long-term competitive differentiation. To address this research gap, this study proposes fifteen hypotheses based on relevant theory and discussion in the existing literature. The model is presented in Figure 1.

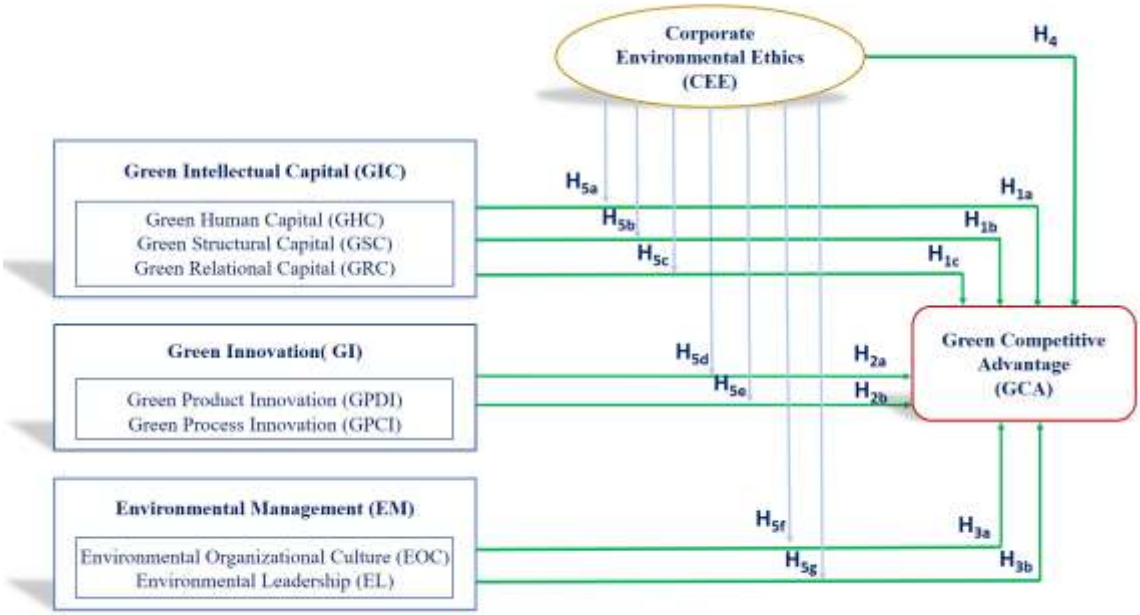

Figure 1. Hypothesized model
Source: Author's design

METHOD

Participants and procedure

This study used the associative hypothesis testing approach to experimentally elucidate the effects of GIC, GI, and EM on GCA, with CEE serving as a moderating variable. The data utilised are primary, obtained by a survey conducted via the distribution of questionnaires to all employees of industrial firms. The participants in this study are personnel from industries that are closely tied to environmental issues, such as the chemical, textile, soap and detergent, and palm oil processing industries. Because the population in this study cannot be identified, the researcher employs the rule of thumb to determine the size of the research sample, but SEM analysis necessitates a sample of at least 5 times the number of indicators employed (Sekaran & Bougie, 2016). The study's minimal sample size is 210 samples of 42 indicators. Employees, managers, and directors in the production division or department, purchasing and procurement, R&D, and marketing are the criteria used in this study's purposive sample approach. The decision to include these divisions was based on the assumption that they know the company's environmental idea better than other divisions. Another factor was the length of service required for directors, managers, and employees—at least three years—to fully grasp the company's operations and how they relate to the environment. As shown in Table 1, 238 out of 30 Indonesian industrial businesses filled out the questionnaire for this study. Of these, 73% were employees, 21% were managers, and the remaining 65 were directors. Four departments participated, with the purchasing and procurement department contributing the most proportion at 39%, while the R&D department contributed the lowest at 11%.

Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

Table 1. Demographic profile of respondents

Respondents		238
Category	**Frequency**	**%**
Position:		
Employee	173	73%
Manager	51	21%
Director	14	6%
Department:		
Marketing	76	32%
Purchasing & Procurement	92	39%
Production	43	18%
R&D	27	11%

Source: Authors' calculations

Measures

As illustrated in Figure 1, the research hypotheses were addressed by measuring the indicators applying ordinal scale measurements of each variable, and the survey questionnaire was developed using a Likert scale with five categories: Strongly Disagree (STS), Disagree (TS), Less Agree (KS), Agree (S), and Strongly Agree (SS). The constructed questionnaire comprises 42 indicators, including 8 dependent variable indicators for GCA, based on (Chen's measurement (2011), and 4 moderating variable indicators for CEE, referencing (Chang's measurement (2011). Additionally, it includes 30 independent variable indicators: 14 indicators of GIC (5 for GHC, 6 for GSC, and 3 for GRC) as per (Chang & Chen, 2012); 6 indicators of GI (3 for GPDI and 3 for GPCI) according to (Chang, 2011); and 10 indicators of EM (6 for EOC and 4 for EL) based on (Chen's measurement (2011).

Data analysis

This study use Structural Equation Modelling (SEM) for latent analysis, utilising reflecting indicators. Covariance-based SEM shows that the theories in this study are very strong in explaining the research model. The study hypothesis is tested using AMOS 22.00 software, which consists of two stages: the Measurement Model and the Structural Model (Byrne, 2022; Kaplan, 2020; Schumacker & Lomax, 2022).

RESULT

The analysis begins by analyzing descriptive statistics from all research variables. The statement items of each variable show that an average of 238 respondents stated "agree" or close to 4 (minimum range 1 and maximum 5), consistent with the mode of all variables, which is 4. The details of each variable are as follows: GCA (3,691), GHC (3,858), GSC (3,880), GRC (3,839), GPDI (3,888), GPCI (3,923), EOC (3,908), EL (3,898), CEE (3,788). This study has met the rule of thumb to be able to evaluate research results and report them systematically. However, the critical ratio (CR) of this study is 42.910 (data is said to be normal if the critical ratio of the multivariate ranges from -2.58 <c.r. <2.58). Based on the limit central theorem (Adams, 2009), the larger the sample size, the statistics obtained will approach a normal distribution. N = 238 is considered to have met the central limit theorem so that normality can be ignored.

In addition, the measurement model was evaluated using Confirmatory Factor Analysis (CFA), which tested the construct's validity and reliability. Table 2 presents the findings of the CFA test for each research variable. If the p-value in the output estimate is below 5% and the loading factor (λ) exceeds 0.5, the indicators for all variables are deemed valid. The reliability assessment is conducted by examining the Construct Reliability (CR) value of ≥ 0.7 and the Variance Extracted (VE) of ≥ 0.5 for each construct in this study, indicating dependability. The subsequent phase involves evaluating the structural model by analysing the goodness of fit (GoF), as illustrated in Table 3. The preliminary assessment of the GoF index SEM statistic indicates a "Poor fit" across

Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

all parameters. Consequently, it is imperative to alter the framework of the study model. Table 4 presents the results of the modification indices, indicating if the model may be enhanced by linking unestimated variables. The modification index summarises the decline in chi-square value or reduction in chi-square value that occurs during coefficient estimation. The GoF index test of adjusted SEM statistics is shown in Table 5. Specifically, in the parsimonious fix indices, a strong fit for RMR criterion and marginal fit for NNFI/TLI were found. In contrast, each category of absolute fit and incremental indices produced marginal fit and bad fit outcomes. Consequently, each category has demonstrated both good and marginal fit, indicating that the model satisfies the goodness of fit (GoF) criterion. The utilisation of 4-5 goodness of fit criteria is seen adequate for evaluating a model's viability, provided that each criterion, including absolute fit indices, incremental fit indices, and parsimony fit indices, is represented.

Table 2. CFA test results

Variable	Number of Statement Items	Alpha Coefficient	P-Value	CR	VE
GCA	8	0,725 - 0,912	0,000	0,942	0,673
GHC	5	0,733 - 0,911	0,000	0,907	0,663
GSC	6	0,745 - 0,868	0,000	0,930	0,689
GRC	3	0,647 - 0,786	0,000	0,796	0,497
GPDI	3	0,590 - 0,855	0,000	0,838	0,568
GPCI	3	0,790 - 0,856	0,000	0,860	0,607
EOC	6	0,576 - 0,914	0,000	0,880	0,556
EL	4	0,663 - 0,863	0,000	0,867	0,622
CEE	4	0,723 - 0,857	0,000	0,862	0,610

Source: Amos process results

Table 3. Initial test of goodness of fit index statistics

Criteria	Cut off Value	Research Results	Assessment
Absolute fit			
GFI	≥ 0,90	0,572	Inadequate compatibility
RMSEA	≤ 0,08	0,120	Inadequate compatibility
Incremental of indices			
AGFI	≥ 0,90	0,524	Inadequate compatibility
NFI	≥ 0,90	0,631	Inadequate compatibility
CFI	≥ 0,90	0,687	Inadequate compatibility
IFI	≥ 0,90	0,688	Inadequate compatibility
Parsimonious fix indices			
NNFI/TLI	≥ 0,90	0,667	Inadequate compatibility
RMR	≤ 0,05	0,144	Inadequate compatibility

Source: Amos process results

Table 4. *Output modification indices*

			M.I.	Par Change
CEE	<-->	EOC	59,029	0,1460
GPCI	<-->	EOC	113,629	0,1610
GPCI	<-->	CEE	68,828	0,1900

Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

GPDI	<-->	EOC	115,508	0,1120
GPDI	<-->	CEE	43,383	0,1040
GPDI	<-->	GPCI	82,592	0,1140
GRC	<-->	EOC	26,416	-0,0740

Source: Amos process results

Table 5. Goodness of fit index statistics modified results test

Criteria	Cut off Value	Before Modification	After Modification	Assessment
Absolute fit				
GFI	≥ 0,90	0,572	0,727	*Bad fit*
RMSEA	≤ 0,08	0,12	0,085	*Marginal fit*
Incremental of indices				
AGFI	≥ 0,90	0,524	0,675	*Bad fit*
NFI	≥ 0,90	0,631	0,787	*Marginal fit*
CFI	≥ 0,90	0,687	0,852	*Marginal fit*
IFI	≥ 0,90	0,688	0,854	*Marginal fit*
Parsimonious fix indices				
NNFI/TLI	≥ 0,90	0,667	0,832	*Marginal fit*
RMR	≤ 0,05	0,144	0,047	*Good fit*

Source: Amos process results

The moderation test can be carried out by first adding interaction variables between the independent variables (GHC, GSC, GRC, GPDI, GPCI, EOC, and EL) with the moderator variable, namely corporate environmental ethics (GCA). Figure 2 shows the results of the structural model, with the regression equation constructed with the estimated coefficients of the regression equation as follows:

$$\eta GCA=0.326\cdot\xi GHC+0.178\cdot\xi GSC+0.256\cdot\xi GRC+0.076\cdot\xi GPDI+0.086\cdot\xi GPCI+0.183\cdot\xi EOC+0.053\cdot\xi EL+0.836\cdot\xi CEE+0.004\cdot(\xi GHC\times\xi CEE)+0.001\cdot(\xi GSC\times\xi CEE)+0.031\cdot(\xi GRC\times\xi CEE)+0.002\cdot(\xi GPDI\times\xi CEE)+0.001\cdot(\xi GPCI\times\xi CEE)+0.004\cdot(\xi EOC\times\xi CEE)+0.000102\cdot(\xi EL\times\xi CEE)+\zeta GCA.$$

The R-square value was 0.797, signifying that the independent and moderating variables accounted for 79.7% of the variance in GCA. The error variance of 0.203 suggested that GCA was affected by unexamined factors, constituting 20.3%.

Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

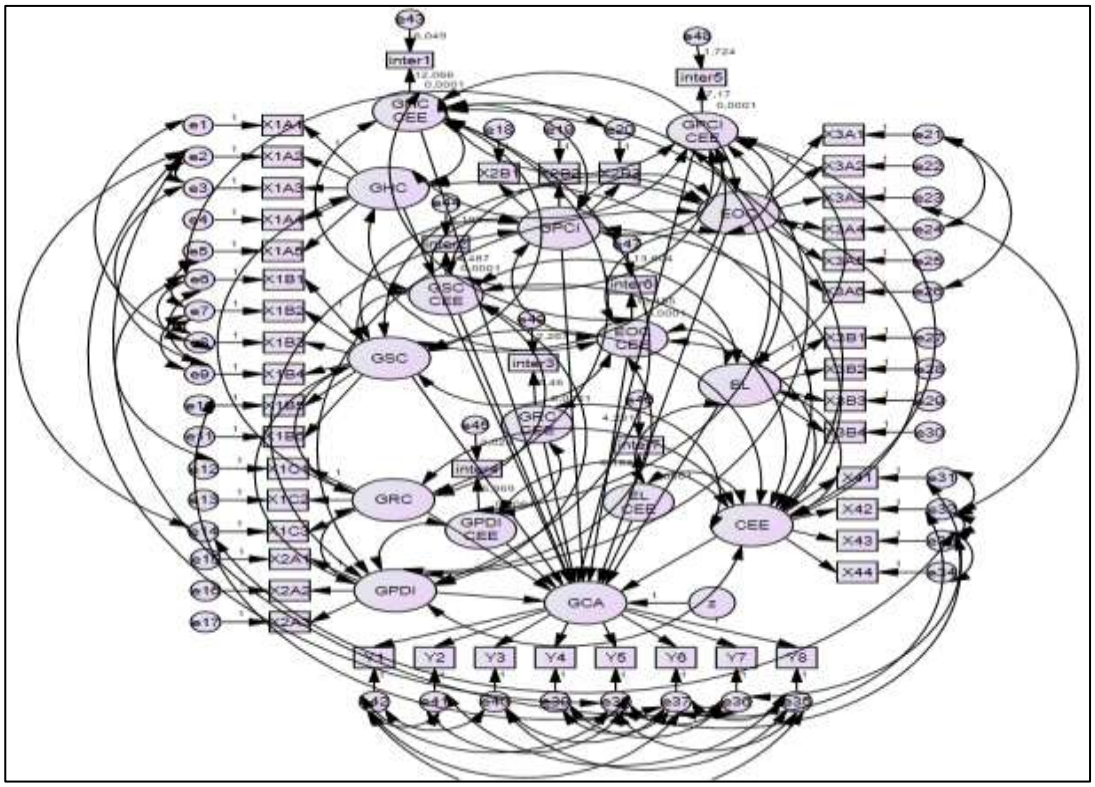

Figure 2. SEM output results of structural model
Source: Amos process results

The relationship between independent variables and dependent variables is illustrated in Table 6 from the aforementioned structural model. The association between each variable predicted positive (+) with a P value for one-tailed > 1.64 resulted in six hypotheses accepted and nine hypotheses rejected (p > 0.05). GHC, GSC, GRC, EOC, and CEE have demonstrated a beneficial impact on GCA. The moderating influence of CEE has been demonstrated to enhance the favourable impact of GHC on GCA.

Table 6. Hypothesis test results

No.	Correlation			Prediction Direction	C.R.	P-Value (one-tailed)
1	GHC	→	GCA	+	4,094	0,000
2	GSC	→	GCA	+	1,789	0,037
3	GRC	→	GCA	+	2,718	0,003
4	GPDI	→	GCA	+	1,378	0,084
5	GPCI	→	GCA	+	0,790	0,215
6	EOC	→	GCA	+	1,975	0,024
7	EL	→	GCA	+	1,336	0,091
8	CEE	→	GCA	+	2,978	0,001
9	GHC*CEE	→	GCA	+	3,488	0,000
10	GSC*CEE	→	GCA	+	0,584	0,279
11	GRC*CEE	→	GCA	+	1,160	0,123
12	GPDI*CEE	→	GCA	+	1,300	0,097
13	GPCI*CEE	→	GCA	+	0,535	0,297
14	EOC*CEE	→	GCA	+	1,519	0,065
15	EL*CEE	→	GCA	+	0,015	0,499

Source: Amos process results.

Owner: Riset & Jurnal Akuntansi
e –ISSN : 2548-9224 | p–ISSN : 2548-7507
Volume 10 Nomor 1, January 2026
DOI : https://doi.org/10.33395/owner.v10i1.3182

DISCUSSION

Green human capital positively contributes to GCA, where employees (in this case, human capital) are considered internal stakeholders because they contribute to the company's ability to generate value. The organisation must enhance this value to attain a competitive edge. In accordance with the Resource-Based View, human capital constitutes one of the resources possessed by the organisation. It serves as a catalyst in the company's operations, a scarce resource in the market, and is favourably correlated with the company's performance (strategic resources). Company performance can be defined as a company's competitive edge over its market competitors. Moreover, GSC significantly influences GCA, whereas Structural capital pertains to the organisational framework of a corporation that facilitates and aids personnel (human capital) in achieving optimal overall performance or value. Strategic resources can have a favourable impact on a company's performance if they can maximise and enhance the use of current structural capital. An individual may possess significant intellectual capacity as human capital; nevertheless, if the company's structure is deficient, such potential may be rendered futile. An organisation possessing robust structural capital will cultivate a culture that empowers employees to explore their capabilities. Incorporating the notion of "green" into the company's structural capital will enhance its focus on environmental concerns, hence providing a competitive advantage in relation to sustainability, referred to as a GCA.

Green human capital enhances GCA, as employees are seen as internal stakeholders due to their role in the company's value generation capacity. The organisation must augment its value to achieve a competitive advantage. According to the RBV, human capital is one of the organisation's resources. It acts as a catalyst in the company's operations, a rare resource in the market, and is positively connected with the company's performance (strategic resources). Company performance is defined as a firm's competitive advantage relative to its market rivals. Furthermore, green structural capital substantially impacts GCA, whereas Structural capital refers to the organisational framework of a firm that supports and enables individuals (human capital) to attain optimal overall performance or value. Strategic resources can positively influence a company's performance by optimising and augmenting the utilisation of existing structural capital. An individual may have substantial intellectual capacity as human capital; nevertheless, if the company's structure is inadequate, such potential may be rendered ineffective. An company with strong structural capital will foster a culture that enables employees to develop their potential. Integrating the concept of "green" into the company's structural capital will augment its emphasis on environmental issues, thereby offering a competitive edge in sustainability, termed a GCA.

There is no correlation between an organization's environmental culture and a rise in its GCA. Executives in developed nations are acutely aware of their environmental responsibilities, enabling them to welcome and motivate their subordinates to engage in EM and protection. Conversely, in Indonesia, a developing nation, most corporate leaders recognise environmental sustainability yet remain reluctant and uncertain about engaging and motivating their staff to contribute directly. Another consideration is that just fourteen participants were directors of the companies surveyed, fifty-one were managers, and the remaining two hundred and thirty-three were employees. Directors are people who can readily create, invite, and encourage an environmental policy, in contrast to other respondents who find it rather difficult to do the same, which, according to researchers, is one reason why there aren't very many of them. CEE can enhance green competitive advantage. Organisations with environmental ethics typically exhibit greater diligence regarding ecological concerns in their operations. The established ethics resemble structural capital, albeit this ethic may be unwritten within the organisation. Through this environmental ethic, customers, as stakeholders, will enhance the organization's "green" image and derive greater value from stakeholders, particularly consumers, so achieving a GCA. GCA refers to a scenario in which a corporation has adopted a strategy aimed at environmental protection. Simultaneously, its competitors have not adopted similar measures, which is advantageous for the company, as consumers who are already cognisant of environmentalism will favour its products/services over those of competitors lacking an environmental protection strategy.

The moderating link in this study is that CEE can enhance the relationship between GHC and GCA. CEE pertains to a company's moral principles regarding its environmental impact.

Human capital without ethics is meaningless since ethics governs how a person or corporation behaves. It is essential that sound ethics underpin human capital inside a corporation to achieve its objectives. Eco-conscious human capital, bolstered by CEE, will undoubtedly yield a sustainable competitive edge. Simultaneously, CEE cannot enhance the impact of GSC and GRC on GCA. Companies in Indonesia that are currently unable to enable corporate ethics to immediately interface with the organization's structure are to blame for this outcome. Furthermore, companies in Indonesia have not been able to use corporate ethics to increase relational capital and have not fully realised the potential of these corporate ethics because most Indonesian companies still do not focus on the triple bottom line, namely people, planet, and profit, but only on profit, profit, and profit. The notion of ethics remains elusive, while its advantages are palpable. Moreover, CEE cannot enhance the impact of GPDI and GPCI on GCA, as the sampled industries exhibit insufficient innovation in their goods or processes. Moreover, CEE cannot enhance the impact of EOC and EL on augmenting GCA. The integration of both within Indonesian companies has been inadequate. Because Indonesian corporate culture has not yet been fully developed and organised, businesses there have not been able to use corporate ethics to raise the value of their environmental culture. Similarly, the role of leaders is seen significant as they are accountable for establishing conditions through the formulation of a strategic vision and the advancement of certain corporate cultures that facilitate the attainment of GCA. In Indonesia, corporate executives are reluctant and uncertain about motivating people to contribute directly, despite the expectation that leaders should exemplify ethical behaviour for their subordinates.

CONCLUSION

Assume the organisation possesses environmentally conscious human capital among its personnel and can leverage these resources effectively. In that scenario, the resultant company valuation pertains to environmental conservation or a competitive edge associated with environmental stewardship. Green structural capital includes organizational capabilities, commitment, knowledge management systems, reward systems, information technology systems, databases, managerial institutions, operational processes, managerial philosophy, organizational culture, corporate image, patents, copyrights, trademarks, and other components associated with environmental protection or green innovation, which may provide a competitive advantage to the company. The company's cumulative interactive engagement with customers, suppliers, and partners about corporate environmental management and green innovation can confer a competitive advantage. Green product innovation and green process innovation are priorities for industrialised nations, unlike Indonesia, which is classified as a developing country. Consequently, it is expected that the findings of this study differ from those of prior research. By viewing company culture as a strategic weapon, businesses can capitalise on their distinctive, valuable, and difficult-to-copy culture to get an edge in the market. Environmental organisational culture has little impact on green competitive advantage due to disparities in implementation between developed and developing countries, as well as a lack of representation at the director level. Conversely, corporate environmental ethics significantly contributes to enhancing green competitive advantage by cultivating a favourable perception among consumers. Corporate environmental ethics enhances the beneficial impact of green human capital on green competitive advantage. Nonetheless, it does not substantially influence the relationship between green structural capital and green competitive advantage due to the lack of integrated implementation in Indonesian enterprises. The function of corporate environmental ethics as a moderating variable in relation to green competitive advantage. Specifically, corporate environmental ethics improves the positive impact of green human capital on green competitive advantage by providing a moral foundation and ideals for environmentally conscientious human resources. Nevertheless, corporate environmental ethics does not enhance the impact of green structural capital, green relational capital, green product and process innovation, environmental organisational culture, and environmental leadership on green competitive advantage. This results from the insufficient integration of ethical implementation with these factors in Indonesian enterprises, the predominant focus on profit, and the industry's relatively low level of innovation.

Implications

Companies need to prioritize environmental ethics to improve their image and invest in competent human resources in the environmental field. Integration of sustainability strategies into all aspects of the business is essential, not just partial implementation. Company leaders must be proactive in promoting sustainable practices. Indonesian companies must prioritise the triple bottom line (people, planet, profit) rather than solely focussing on profit maximisation.

The government needs to provide incentives (tax reductions, green technology subsidies) for companies that implement sustainable practices, as well as tighten environmental regulations. In addition, the government needs to increase environmental awareness through campaigns, training, support for environmental organizations, and funding for green innovation, including involving company directors in environmental initiatives.

This study offers empirical evidence for the Resource-Based View (RBV) and Stakeholder Theory about sustainability, indicating that internal resources and external stakeholder connections can serve as sources of green competitive advantage. The significance of corporate environmental ethics as a crucial element in augmenting green competitive advantage offers fresh perspectives on how ethics might influence the correlation between resources and environmental performance. The research is further enriched by examining the determinants of green competitive advantage in Indonesia, a developing nation with distinct attributes.

For greater generalisation, future research should broaden the sample beyond the chemical, textile, soap, detergent, and palm oil industries. Additionally, more director responders should be included. Employing qualitative or mixed methodologies is advisable for a comprehensive knowledge of the determinants affecting green competitive advantage. Furthermore, it is advisable to incorporate supplementary moderating variables such as governmental regulation or public pressure, investigate the mediation and moderation dynamics across variables more comprehensively, and implement a longitudinal design to monitor variable changes over time.

REFERENSI

Adams, W. J. (2009). *The Life and Times of the Central Limit Theorem* (Second Edi). Kaedmon Pub. Co., New York.

Aulia, A., Siahaan, M., & Siregar, J. K. (2025). Green Accounting and Environmental Performance on Financial Performance: Strategic Insights from the Mining Industry in Indonesia. *Asian Journal of Environmental Research*, *2*(1), 16–28. https://doi.org/10.69930/ajer.v2i1.272

Barney, J. (1991). Firm Resource and Sustained Competitive Advantage. *Journal of Management*, *Vol. 17*(No. 1), 99–120. https://journals.sagepub.com/doi/10.1177/014920639101700108

Berry, M. A., & Rondinelli, D. A. (1998). Proactive Corporate Environmental Management: A New Industrial Revolution. *The Academy of Management Executive*, *Vol. 12*(No. 2), 38–50.

Borah, P. S., Dogbe, C. S. K., & Marwa, N. (2024). Green dynamic capability and green product innovation for sustainable development: Role of green operations, green transaction, and green technology development capabilities. *Corporate Social Responsibility and Environmental Management*, *Vol. 32*(No. 1), 911–926. https://doi.org/10.1002/csr.2993

Boubaker, L., Djebabra, M., & Saadi, S. (2014). Contribution of stakeholder theory in the management of environmental quality of Algerian firms: Case study of the SONATRACH Group, Algeria. *Management of Environmental Quality: An International Journal*, *Vol. 25*(No. 3), 335–351.

Byrne, B. M. (2022). *Structural Equation Modeling With AMOS*. Taylor & Francis. London. https://doi.org/10.4324/9781410600219

Chang, C. (2011). The Influence of Corporate Environmental Ethics on Competitive Advantage: The Mediation Role of Green Innovation. *Journal of Business Ethics*, *Vol. 103*(No. 2), 361–370.

Chang, C., & Chen, Y. (2012). The determinants of green intellectual capital. *Management Decision*, *Vol. 50*(No. 1), 74–94.

Chang, C., & Chen, Y. (2013). Green organizational identity and green innovation. *Management Decision*, *Vol. 51*(No. 5), 1056–1070.

Chen, Y.-S. (2008a). The Driver of Green Innovation and Green Image – Green Core Competence. *Journal of Business Ethics*, *Vol. 81*, 531–543.

Chen, Y.-S. (2008b). The Positive Effect of Green Intellectual Capital on Competitive Advantages of Firms. *Journal of Business Ethics*, *Vol. 77*(No. 3), 271–286. https://doi.org/10.1007/s10551-006-9349-1.

Chen, Y.-S. (2011). Green organizational identity: sources and consequence. *Management Decision*, *Vol. 49*(No. 3), 384–404.

Chen, Y.-S., & Chang, C.-H. (2013). The Determinants of Green Product Development Performance: Green Dynamic Capabilities, Green Transformational Leadership, and Green Creativity. *Journal of Business Ethics*, *Vol. 116*, 107–119.

Chen, Y.-S., Chang, C., & Wu, F. (2012). Origins of green innovations: the differences between proactive and reactive green innovations. *Management Decision*, *Vol. 50*(No. 3), 368–398.

Chen, Y.-S., Lai, S.-B., & Wen, C.-T. (2006). The Influence of Green Innovation Performance on Corporate Advantage in Taiwan. *Journal of Business Ethics*, *Vol. 67*, 331–339.

Cheng, M.-Y., Lin, J.-Y., Hsiao, T.-Y., & Lin, T. W. (2010). Invested resource, competitive intellectual capital, and corporate performance. *Journal of Intellectual Capital*, *Vol. 11*(No. 4), 433–450.

Chuang, S.-P., & Huang, S.-J. (2015). Effects of Business Greening and Green IT Capital on Business Competitiveness. *Journal of Business Ethics*, *Vol. 128*(No. 1), 221–231.

Deegan, C., Rankin, M., & Tobin, J. (2002). An examination of the corporate social and environmental disclosures of BHP from 1983-1997: A test of legitimacy theory. *Accounting, Auditing & Accountability Journal*, *Vol. 15*(No. 3), 312–343.

Donaldson, T., & Preston, L. E. (1995). The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *The Academy of Management Review*, *Vol. 20*(No. 1), 65–91.

Dowling, J. & Pfeffer, J. (1975). Organisational legitimacy: Sosial values and organisational behavior. *Pacific Sociological Review*, *Vol. 18*(No. 1), 122–136.

Eugénio, T. P., Lourenço, I. C., & Morais, A. I. (2013). Sustainability strategies of the company Timor: extending the applicability of legitimacy theory. *Management of Environmental Quality: An International Journal*, *Vol. 24*(No. 5), 570–582.

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Pitman Publishing Inc. https://openlibrary.org/books/OL3170928M/Strategic_management

Huang, C., & Kung, F. (2011). Environmental consciousness and intellectual capital management: Evidence from Taiwan's manufacturing industry. *Management Decision*, *Vol. 49*(No. 9), 1405–1425.

Intergovernmental Panel on Climate Change. (2024). *AR6 Synthesis Report: Climate Change 2023*. https://www.ipcc.ch/report/sixth-assessment-report-cycle/

Kaplan, D. (2020). *Structural Equation Modeling Foundation and Extensions*. SAGE Publications, Inc.

Lin, R.-J., Chen, R.-H., & Huang, F.-H. (2014). Green innovation in the automobile industry. *Industrial Management & Data Systems*, *Vol. 114*(No. 6), 886–903.

Lin, Y.-H., & Chen, Y.-S. (2017). Determinants of green competitive advantage: the roles of green knowledge sharing, green dynamic capabilities, and green service innovation. *Journal of Quality and Quantity*, *Vol. 51*, 1663–1685.

Lisnawati, L., & Siahaan, M. (2025). Can Green and Blue Thematic Financing Enhance Sustainability Value? Evidence from Southeast Asia. *International Journal of Ethics and Systems*. https://doi.org/10.1108/IJOES-11-2024-0374

Lusmeida, H., & Siahaan, M. (2025). Combined Effect of Company Risk Management , Intellectual Capital and Shareholder Rights on Sustainable Finance in Indonesian Financial Service Sector. *International Journal of Sustainable Development and Planning*, *20*(8), 3453–3467. https://doi.org/doi.org/10.18280/ijsdp.200826

Magness, V. (2006). Strategic posture, financial performance and environmental disclosure: An empirical test of legitimacy theory. *Accounting, Auditing & Accountability Journal*, *Vol. 19*(No. 4), 540–563.

McWilliams, A., Siegel, D. S., & Wright, P. M. (2006). Guest Editors' Introduction Corporate Social Responsibility: Strategic Implications. *Journal of Management Studies*, *Vol. 43*(No. 1), 1–18.

Mohamed, C., Sylvain, D., & Jacques, R. (2014). France's new economic regulations: insights from institutional legitimacy theory. *Accounting, Auditing & Accountability Journal*, *Vol. 27*(No. 2), 283–316.

Nauli, T. D., & Mutiara, I. (2025). Asset misuse: Internal governance control restrains. *Global Research Review in Business and Economics*, *11*(2), 67–74.

Otola, I., Ostraszewska, Z., & Tylec, A. (2013). New directions of development of resource-based view in creating a competitive Advantage. *Business Management Dynamics*, *Vol. 3*(No. 2), 26–33.

Pemerintah Republik Indonesia. (1997). Law Number 23 Year 1997 Concerning Environmental Management. *State Gazette of the Republic of Indonesia 1997*, *No. 1*, 21. http://ciptakarya.pu.go.id/dok/hukum/uu/uu_23_1997.pdf

Ramlogan, R. (1997). Environment and human health: a threat to all, Environmental. *Management and Health*, *Vol. 8*(No. 2), 51–66.

Schumacker, R. E., & Lomax, R. G. (2022). *A Beginner's Guide to Structural Equation Modeling* (4th Editio). Routledge.

Sekaran, Uma & Bougie, R. J. (2016). *Research Methods for Business: A Skill Building Approach* (7th ed.).

John Wiley & Sons, Inc.

Siahaan, M. (2025). Use Big Theory Clarifies Financial Performance: The Role of Internal Mechanisms Control. *Journal of Accounting and Strategic Finance*, *8*(1), 94–109. https://doi.org/10.33005/jasf.v8i1.596

Siahaan, M., Nauli, T. D., & Siahaan, B. P. (2024). Can Internal Mechanisms Control Detect Corruption Through Fraudulent Behaviour ? *AFRE Accounting and Financial Review*, *Vol. 7*(No. 1), 1–8. https://doi.org/10.26905/afr.v7i1.11893

Siahaan, M., Suharman, H., Fitrijanti, T., & Umar, H. (2023a). When internal organizational factors improve detecting corruption in state-owned companies. *Journal of Financial Crime*, *Vol. 31*(No. 2), 376–407. https://doi.org/10.1108/JFC-11-2022-0292

Siahaan, M., Suharman, H., Fitrijanti, T., & Umar, H. (2023b). Will the integrated GRC implementation be effective against corruption? *Journal of Financial Crime*, *30*(No. 1), 24–34. https://doi.org/10.1108/jfc-12-2021-0275

Steinmann, H. (2008). Towards a conceptual framework for corporate ethics: problems of justification and implementation. *Society and Business Review*, *Vol. 3*(No. 2), 133–148.

Swartz, N., & Firer, S. (2005). Board structure and intellectual capital in South Africa. *Meditari Accountancy Research*, *Vol. 13*(No. 2), 145–166.

Tan, K., & Cross, J. (2012). Influence of resource-based capability and inter-organizational coordination on SCM. *Industrial Management & Data Systems*, *Vol. 112*(No. 6), 929–945.

Tran, B. (2008). Paradigms in corporate ethics: the legality and values of corporate ethics. *Social Responsibility Journal*, *Vol. 4*(No. 1), 158–171.

Tseng, M. L., W, R., Chiu, A. S. F., Geng, Y., & Lin, Y. H. (2013). Improving performance of green innovation practices under uncertainty. *Journal of Cleaner Production*, *Vol. 40*, 71–82.

Warnier, V., Weppe, X., & Lecocq, X. (2013). Extending Resource-Based Theory: Considering Strategic, Ordinary and Junk Resources. *Management Decision*, *Vol. 51*(No. 7), 1359–1379.