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GREEN INTELLECTUAL CAPITAL AND SUSTAINED COMPETITIVE ADVANTAGES IN THE INDUSTRIAL SECTOR OF INDONESIA

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ABSTRACT

Purpose: *The purpose of this study is to examine the effect of Green Intellectual Capital which includes three components namely green human capital, green structural capital, and green relational capital on sustainable competitive advantage through h moderation of environmental consciousness in the manufacturing industry in Indonesia, which has been listed on the Indonesia Stock Exchange.*

Methodology/approach: *This research is a quantitative study, the number of samples used is 216 of 316 populations of high-profile sensitive industries listed on the Indonesia Stock Exchange. The survey was conducted at a managerial level with a minimum of 3 years experiences. This study used a questionnaire instrument with a purposive sampling method and data analysis using Structured Equation Modelling (SEM-PLS)*

Findings: *The empirical results of this study indicate that the three components of green human capital, green structural capital, and green relational capital have proven to have a significant effect on sustainable competitive advantage. While testing through environmental consciousness moderation shows that the three components of green human capital, green structural capital, and green relational capital, have no significant effect on sustainable competitive advantage. The implication of this research is that green intellectual capital can be used as a guide for companies that can ultimately develop and maintain a sustainable competitive advantage.*

Practical implications: *The green human capital can be use as guidance of companies that can ultimately develop and mantaian the competitive advantage*

Originality/value: *The originality of this research is the variable of green intellectual capital and competitive advantage in winning the competitive strategy for companies, the research results that the sustainable competitive advantage which will be the focus of study for the next researcher.*

Keywords: *Environmental Consciousness; Green Intellectual Capital; Sustained Competitive Advantages.*

ABSTRAK

Tujuan penelitian: Tujuan dari penelitian ini adalah untuk menguji pengaruh Green Intellectual Capital yang meliputi tiga komponen yaitu green human capital, green structural capital, dan green relational capital terhadap keunggulan kompetitif berkelanjutan melalui moderasi kesadaran lingkungan pada industri manufaktur di Indonesia, yang telah terdaftar di Bursa Efek Indonesia.

Metode/pendekatan: Penelitian ini merupakan penelitian kuantitatif, jumlah sampel yang digunakan adalah 216 dari 316 populasi industri sensitif profil tinggi yang terdaftar di Bursa Efek Indonesia. Survey dilakukan pada level manajerial dengan pengalaman minimal 3 tahun. Penelitian ini menggunakan instrumen kuesioner dengan metode purposive sampling dan analisis data menggunakan Structured Equation Modeling (SEM-PLS).

Hasil: Hasil empiris penelitian ini menunjukkan bahwa ketiga komponen green human capital, green structural capital, dan green relational capital terbukti berpengaruh signifikan terhadap keunggulan kompetitif berkelanjutan. Sedangkan pengujian melalui moderasi kesadaran lingkungan menunjukkan bahwa ketiga komponen green human capital, green structural capital, dan green relational capital, tidak berpengaruh signifikan terhadap keunggulan kompetitif berkelanjutan. Implikasi dari penelitian ini bahwa green intellectual capital dapat digunakan sebagai panduan bagi perusahaan yang pada akhirnya dapat mengembangkan dan mempertahankan keunggulan kompetitif berkelanjutan.

Implikasi praktik: Green human capital dapat digunakan sebagai pedoman perusahaan yang pada akhirnya dapat berkembang dan mempertahankan keunggulan kompetitif

Orisinalitas/kebaharuan: Orisinalitas penelitian ini adalah variabel green intellectual capital dan keunggulan bersaing dalam memenangkan strategi bersaing bagi

perusahaan, hasil penelitian tersebut adalah keunggulan bersaing berkelanjutan yang akan menjadi fokus kajian bagi peneliti selanjutnya.

Kata kunci: Green Intellectual Capital; Kesadaran Lingkungan; Keunggulan Kompetitif Berkelanjutan.

INTRODUCTION

The information era and knowledge has changed the business environment to become increasingly competitive, the focus of business development is no longer based on industrial machines, but on the ability of knowledge-based human resources known as intellectual capital (IC) (Chang, CH.; and Chen, YS, 2012)

The information era and knowledge has changed the business environment to become increasingly competitive, the focus of business development is no longer based on industrial machines, but on the ability of knowledge-based human resources known as intellectual capital (IC) (Chang, CH.; And Chen, YS, 2012). Furthermore, it was explained that IC is an intangible asset in the form of knowledge, experience, information, and technology owned by the company. Currently IC has become the focus of attention in various fields, both management, information technology, and accounting (Dost, M. *et al.*, 2016).

One area that has attracted attention, both academics and practitioners, is the use of IC as an instrument for determining corporate value (Saher, 2015). However, in the reality, the management and reporting systems that have been presented by companies so far have lost relevance, because they have not been able to provide comprehensive IC information to manage knowledge-based processes (Liao et al., 2013). In line with the development of environmental issues, Chen et al., (2008) developed IC by incorporating green elements into intellectual capital. The importance of green intellectual capital associated with environmental issues can indirectly affect the competitive advantage of sustainability in manufacturing companies. Green intellectual capital is an intangible asset of a company, including knowledge, employee capabilities, experience, technology, and the ability to implement innovations to achieve sustainable competitive advantage. Furthermore, Chen revealed that the components of green intellectual capital consist of green human capital, green structural capital, and green relational capital. The results of this study conclude that companies that want to maintain a sustainable competitive advantage through their green intellectual capital can do so by increasing the company's ability to environmental consciousness.

Therefore, it is important for industrial companies to understand innovation related to environmental management (Chen et al., 2008) Green Intellectual Capital includes, among others, Green human capital that can play an important role in achieving sustainability goals. This means that all employees and managers must have the necessary knowledge, skills, abilities, experience, attitudes, wisdom, creativity, and communication skills to deal with environmental issues (Sanchez and Angel, 2007). Employee commitment refers to decision-making and resources allocated based on a long-term perspective, relying on strong social and environmental consciousness in every part of the company, coupled with the support of high-level managers, encouraging employees to act on environmental awareness. Green structural capital refers to certain specifications, empowerment, and supporting infrastructure related to environmental protection or sustainable strategy development. A

well-engineered and well-managed environmental management system within an enterprise will reduce unnecessary consumption of energy and materials and help to increase productivity. In addition, environmental products enable companies to demand premium prices for company products and services and build a positive corporate image (Chen, 2011; Huang et al., 2014). Green relational capital includes knowledge from market channels, relationships with customers and suppliers, and government or industry networks (Murthy and Mouritsen, 2011; Yann Su, 2014). green relational capital refers to customers, suppliers, and business partners related to environmental management and green innovation. With regard to customers, companies must commit to increase customer loyalty and satisfaction through increased spending on green products or services to increase sales. Companies must also ensure the quality of green products and services offered by suppliers and maintain healthy interactions with suppliers to increase the number and value of supplier alliances.

Phenomena that occur in Indonesia, oil and gas, and coal mining activities can have positive and negative impacts, the positive impact of oil and gas and coal mining exploration and exploitation is increasing state foreign exchange and local revenue as well as accommodating labor, while the negative impact of mining activities can be grouped in the form of damage to the earth's surface, waste, noise, air pollution, and land subsidence. . Environmental pollution is a condition that occurs due to changes in environmental conditions including land, air and water which damage and harm human, animals and plant life. This is caused by the presence of foreign objects such as garbage, industrial waste, oil, hazardous metals and so on, result of human actions, resulting in the environment not functioning as before (Teletov et al, 2019). In addition to oil and gas, the new coal industry is also a phenomenon that damages the environmental, the coal industry is not carried out in an environmentally friendly manner and there are even indications that it has damaged the environment a lot. The proof is, if there is a sufficiently high rainfall, there is a risk of flooding besides landslides and a lot of agricultural land that is buried by the mud of coal mining waste which damages the environment a lot and only brings misery to the people. The effects of this environmentally unfriendly activity have left mine pits in mining areas that have not been closed or reclamation. Even some of the voids have become death holes because they have claimed the lives of people around the mining area. Lauri, M, Greenpeace international activist said, the use of coal causes 60 thousand Indonesians to die every year, because coal pollution causes lung cancer, stoke, respiratory disease and other problems related to air pollution. (<https://www.kaltimprov.go.id/berita/mining>).

This research differs from previous research, in research conducted by Chaudhry et al., (2016), green intellectual capital can help direct company employees to achieve goals. Many companies do indeed place green intellectual capital in their business strategy because they realize that this strategy has become an important moment currently. The green intellectual capital has an influence on company value because it is the development of intellectual capital which is a component of business capital focusing on knowledge and human resources as assets. In this study, by adding environmental consciousness as a moderating variable to explore the effect of green intellectual capital on sustainable competitive advantage. The environmental consciousness variable mediates internal and external factors in the manufacturing industry, related to industrial processes in achieving goals will be influenced by various factors of environmental uncertainty and dynamics, such as environmental complexity, dynamism, and richness. This environmental consciousness becomes an integral part of the process of achieving the organization's efforts to obtain and maintain a sustainable competitive advantage, which include: 1) Environmental consciousness that is applied can increase the trust of stakeholders (employees, management,

owners and society); 2) Environmental consciousness that is implemented can support the company's competitive strategy; 3) Environmental consciousness implemented can support the safety or health of workers.

Resource-based theory arises, because there is strategic question of Why a company can outperform other companies and have sustainable superior performance? Companies that build their own resources and control, will have the ability to maintain their superiority compared to companies that buy or obtain their resources from outside the organization.

Stakeholder theory describes the relationship between internal and external organization, and then describes how these relationships influence business activities. Stakeholders are people or groups that can influence or be influenced by an organization. Stakeholder come from inside or outside the business, examples include customers, employees, shareholders, supplier, non-profit groups, governments, and local communities, among many others. In general, stakeholder theory includes a collection of policies and practices related to stakeholders, values, compliance with legal provisions, community and environmental respect, and the commitment of the business world to contribute to sustainable development.

The framework proposed in this study describes the three components of green intellectual capital, such as green human capital, green structural capital and green relational capital that influence sustainable competitive advantage by moderating of environmental consciousness.

The model proposed in this study is presented in Figure 1 below.

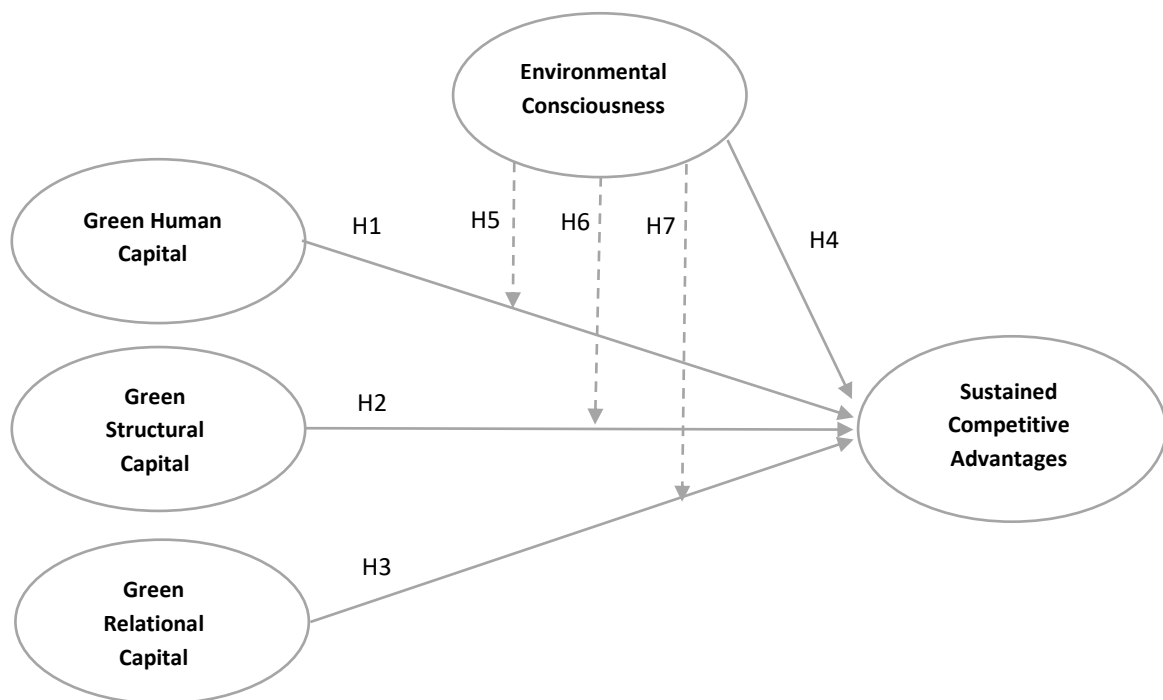


Figure 1.
Research
Framework:
Study Model
Green
Intellectual
Capital and
Sustained
Competitive
Advantage the
Industrial
Sector of
Indonesia

Green Human Capital and Sustained Competitive Advantages

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Companies that are actively involved in environmental management and green innovation can not only minimize production waste and increase productivity but can also increase the relatively high selling price for green products, improve the company's image, and thereby have a positive impact on sustainable competitive advantage. (Hwan-Yanu Su, 2014). Further disclosure that employees who have high knowledge, skills, abilities, experience, attitudes, policies, creativity, and commitment can help companies maintain a sustainable competitive advantage. Green human capital and green structural capital have a significant effect on business sustainability, while green relational capital does not affect business sustainability by Setu Setyawan et al (2022). Green human capital specifically represents individual knowledge that is embedded in the company's capabilities collectively to provide the best solutions for employees (Bontis, 2004). implemented to achieve company goals (Murthy, 2011). Green human capital section is employee capability, employee satisfaction and employee sustainability. For employee sustainability this is important because it is related to the entry and exit of employees, with high employee sustainability for the company it will be easier to achieve goals. Furthermore the employee creativity is also an important part of green human capital. Based on the description above, the first hypothesis proposed in this study is:

H1: *Green human capital has a positive influence on sustained competitive advantages.*

Green Structural Capital and Sustained Competitive Advantage.

Research by Jean-Pierre and Hugo, (2013) reveals that industrial companies have a lot of attention and invest a lot in environmental management and green innovation will not only avoid difficulties or threats regarding environmental protection, but can also improve company image, increase production efficiency, developing a new market environment, and thereby enhancing a sustainable competitive advantage. Therefore, green structural capital which consists of organizational capabilities, organizational commitment, knowledge management systems, reward systems, information technology systems, databases, managerial institutions, operating processes, managerial philosophy, organizational culture, company logos, patents, copy rights, and trademarks, and so on whose use involves linkages with environmental management or so-called green innovation within the company, ultimately can help to create a sustainable competitive advantage. Based on the description above, the second hypothesis in this study is as follows:

H2: *Green structural capital has a positive influence on sustained competitive advantages.*

Green Relational Capital and Sustained Competitive Advantage.

several previous studies suggest that relational capital has a positive effect on a company's competitive advantage (Yu-Hsien Lin, 2017). International regulations that emphasize industrial companies' concern for environmental consciousness, not only minimize production waste, even though the costs incurred are quite large, but companies can increase productivity through green products, improve corporate image, so that have a positive impact on the company's competitive advantage (Jean et al, 2013). Furthermore, it is explained that the exploration of green relation capital through environmental consciousness which include interactive relationships with customers, suppliers and regarding a company's environmental consciousness can help companies in terms of sustainable competitive advantage. International regulations that emphasize industrial companies' concern for environmental awareness, not only minimize production waste, even though the costs incurred are quite large, but companies can increase productivity through green products,

improve corporate image so that it can have a positive impact on sustainable competitive advantage (Unine and Jean -Pierre, 2013). Furthermore, it is explained that the exploration of green relational capital through environmental awareness which includes interactive relationships with customers, suppliers and partners regarding corporate environmental awareness can help companies in terms of sustainable competitive advantage. Based on the description above, the third hypothesis in this study is:

H3: Green relational capital has a positive influence on sustained competitive advantages.

Environmental Consciousness and Sustained Competitive Advantages.

Corporate environmental consciousness are beliefs, ethics, values, and norms regarding environmental policy issues within companies (Bilan et al, 2019). Furthermore, it was explained that concerns regarding global environmental consciousness, companies must invest resources to achieve sustainable development goals, environmental consciousness formulates corporate values and expectations for ethical behavior (Guglani, 2014). Green companies are new ideas, new ethics, and new opportunities, and further explained that social and environmental responsibility has become an unavoidable obligation for companies (Bozhkova, 2018) suggesting, one of the reasons that environmental responsibility social, and environmental aspects provide a sustainable competitive advantage. Companies need a culture able to execute a combination of activities and provide opportunities for employees to know the forces that shape the future of the industry (Purwanti et al, 2022). A company's sustainable competitive advantage is a valuable, rare, inimitable and non-substitutable resource. The resources in question include all assets, capabilities, organizational processes, company characteristics, information, knowledge and so on where these resources are within the company's control for strategy implementation in order to achieve effectiveness and efficiency. Based on the description above, the fourth hypothesis is proposed as follows:

H4: Environmental consciousness has a positive influence on sustained competitive advantage.

Environment consciousness can strengthen the influence of green human capital on sustainable competitive advantage.

Green human capital specifically represents individual knowledge that is embedded in the company's capabilities collectively to provide the best solutions for employees (Bontis, 2004). Implemented to achieve company goals (Murthy, 2011). Thus, green human capital is an element of knowledge, skills, abilities, experience, attitudes, policies, creativity, and commitment that can help sustain competitive advantage which is strengthened through environmental consciousness. Companies that are actively involved in environmental management can not only minimize production waste and increase productivity, but can also increase the relatively high price of green products, improve corporate image, develop markets, thereby having an impact on sustainable competitive advantage. Previous research stated that increasing a company's environmental awareness can be a successful strategy to increase sustainable competitive advantage (Shi and Kane, 2005), therefore through proactive environmental management can lead to long-term economic benefits (Molina et al., 2009). Based on the description above, the fifth hypothesis proposed is as follows:

H5: Environmental consciousness strengthened the influence of green human capital on sustained competitive advantage.

Environmental consciousness can strengthen the influence of green structural capital on sustainable competitive advantage.

Green structural capital is a company resource, includes software, hardware, databases, organizational structures, patents, trademarks, and all company capabilities that support employee productivity. Meanwhile, CIMA (2005) defines green structural capital as knowledge within the company, including organizational routines, procedures, systems, culture, and data bases such as documentation services, existence of knowledge centers, use of information technology, and organizational learning capacity. Research conducted by Hsun Chang (2012) which states that environmental awareness (environmental consciousness) mediates the effect of green structural capital on sustainable competitive advantages (sustained competitive advantages). The results of this study have similarities with research conducted by (Guglani, 2014) that environmental consciousness can increase a company's innovative technological the investment made by companies in terms of environmental awareness is not only aimed at avoiding legal problems regarding environmental protection, but further aims to improve the company's image, increase production efficiency, develop the market environment, thereby enhancing sustainable competitive advantage. Related to organizational capabilities, information technology systems, organizational commitment, manufacturing processes, managerial philosophy, organizational culture, and other components included in green structural capital refer to environmental consciousness. The implementation of this strategy aims to be able to maintain a sustainable competitive advantage. Based on the description above, the sixth hypothesis proposed is as follows:

H6: Environmental consciousness strengthened the influence of green structural capital on sustained competitive advantage.

Environmental consciousness can strengthen the influence of green relational capital on sustained competitive advantage.

Green relational capital is all resources related to the company's relationship with stakeholders such as customers, suppliers, investors, creditors in their perception of the company, for example: image, customer loyalty, customer satisfaction, relationships with suppliers, negotiating capacity with financial entities and environmental activities (Bilan et al, 2019). Meanwhile, according to (Bontis, 2004) the main themes of green relational capital are marketing channels and relationships with customers. It was further revealed that green relational capital also represents the potential of the organization which is obtained from past intangible assets. research conducted by Hsun Chang (2012) which states that environmental consciousness moderate the effect of green relational capital on sustainable competitive advantages (sustained competitive advantages). These intangible assets include knowledge embedded in customers, suppliers, government, or related industry associations, to the essence of green relational capital is embedded knowledge related to the company's external relations. Thus, the seventh hypothesis proposed is as follows:

H7: Environmental consciousness strengthened the influence of green relational capital on sustained competitive advantage

METHOD

Samples dan data

This study uses a quantitative method in the form of a causal study, which aims to describe one or more factors that cause problems, so that it can be stated that the independent variable (X) is the cause of the dependent variable (Y), (Sekaran and Bougie, 2017)

The population in this study are industrial companies that have a risk of environmental impacts, that can contaminate the composition of water and air. As of December 2019, there

were 316 listed industrial companies on the Indonesia Stock Exchange (www.bei.go.id). Respondent in this research were managers who worked at the company and had at least 3 years of experience, including operation managers, financial managers, marketing managers, production managers, IT managers, and HR managers, the reason for choosing managers are responsible for the sustainability of the company, it is further explained that operational managers and production manager are people who represent elements of environmental consciousness, HR managers are people who represent green human capital, financial managers, and IT manager are people who represent green structural capital, while marketing managers are people who represent green relational capital. With a population of 316 industrial companies, determining the number of samples uses the formula (Lemeshow, 2009) as follows:

$$n = \frac{N \cdot Z_{\alpha/2}^2 \cdot p(1-p)}{(N-1) \cdot d^2 + Z_{\alpha/2}^2 \cdot p(1-p)}$$

Description:

n : Number of research samples (respondents)

N : Number of population

d : Absolute precision (*margin of error*) (5% used)

p : Approximate proportion (use 50% because there is no previous research)

$Z_{\alpha/2}$: Standard normal Z statistic ($Z = 1.96$ for $\alpha = 5\%$)

$$\begin{aligned} n &= \frac{(316) \cdot (1,96)^2 \cdot 0,5(1-0,5)}{(316-1) \cdot (0,1)^2 + (1,96)^2 \cdot 0,5(1-0,5)} \\ &= \frac{303,4}{3,16 + 0,961} \\ &= 72 \end{aligned}$$

From number of 72 companies classified as high profile, there are 22 companies in the coal sub-sector, 7 companies in the oil and gas sub-sector, 6 companies in the cement sub-sector, and 9 companies in the pulp and paper sub-sector. The various industrial sectors in the textile and garment sub-sector are 18 companies and the consumer goods sector is in the pharmaceutical sub-sector with 10 companies. This study uses the SEM-PLS (structural equation modeling-partial least square). Data analysis method which is a field of statistical study that can test a series of relationships that are usually difficult to measure simultaneously, multivariate analysis techniques that combine factor analysis and regression analysis, with the aim of examining the relationship between variables in a model. Both between indicators and their constructs and the relationship between constructs. The data source in this study is primary data using a questionnaire instrument that describes the opinions and perceptions of managers as respondents. The questionnaire was prepared using the Likert Scale of 5 points statements ranging from strongly disagree to strongly agree. The Likert Scale used for attitudes, opinions and perceptions of individuals or groups of people about certain phenomena in the context of environmental consciousness and sustainable competitive advantage. With a Likert Scale, the variable to be measured are translated into variable indicators, then these indicators are used as benchmarks for compiling instruments

in the form of respondent statements.

143 Research Variables and Measurement

The operational definition of variables in this study uses three variables, namely the independent variable, the dependent variable, and the moderating variable, the following is a description of each variable:

Variable	Indicator	Total Questions	Reference
Green human capital (X1)	Commitment	2	(Chen, 2008)
	Employee capability	3	
Green structural capital (X2)	Commitment	4	(Chen, 2008)
	Supporting facilities	5	
Green relational capital (X3)	Commitment	2	(Chen, 2008)
	Cooperation intensity	3	
Environment Consciousness Stakeholder perspective (Moderate variable)	Commitment	3	(Hsun Chang, <i>et al</i> 2012)
		4	
Sustainable Competitive Advantage (Y)	Strategy	4	(Burney, <i>et al</i> 2001)
	Performance	7	

Measurement:

Measurement of Green Human Capital Variable refers to research conducted by (Chen, 2008). Developed into two indicators, that is Commitment with measurement indicator includes: trained employees, and timely service, while dimension of Employee Capabilities with measurement indicator includes: competent employees, reliable teamwork, and manager support.

Measurement of Green Structural Capital Variable refers to research conducted by (Chen, 2008). Developed into two indicators, that is Commitment with measurement indicator includes: environmental protection systems, innovation, investment, and development of green product, while dimension of Supporting Facilities measurement indicator includes: environmental protection commissions, application of recycling behavior, knowledge and attitude of environmental consciousness, monitoring and evaluation, as well as giving rewards related to environmental consciousness.

Measurement of Green relational Capital Variable refers to research conducted by (Chen, 2008). Developed into two indicators, that is Commitment with measurement indicator includes: environmentally friendly product or services design, and customer satisfaction, while dimension of Cooperation intensity with measurement indicator includes: cooperation with suppliers who care for the environment, cooperation with clients who care for the environment, and cooperation with strategic partners who environmental care.

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13.1 Measurement of Environmental Consciousness variable refers to research conducted by (Ahmed et al, 2008) and research conducted by (Hsun Chang et al, 2012). In this study the Environmental consciousness variable combines the two studies, the develops it into two

indicators, that is Commitment with measurement indicator includes: environmental policy, manager responsibility, and understanding of environmental policy, while the stakeholder perspective dimension measured by indicator includes: stakeholder trust, strategy, health and safety employees, and environmental audits.

Whereas measurement of Sustained Competitive Advantage Variable refers to research conducted by (Burney et al, 2001). Developed two indicators, that is Strategy with measurement indicator includes: low cost, product or service quality, R&D and innovation, and managerial capabilities. While dimension of Performance with measurement indicator includes: profitability, growth, first mover, corporate image, not easy to imitate, ideas and creativity, and positioning.

Research Model:

$$SCA = \beta_1.GHC + \beta_2.GSC + \beta_3.GRC + \beta_4.ENC + \beta_5.ENC*GHC + \beta_6.ENC*GSC + \beta_7.ENC*GRC + \epsilon_t$$

Description:

GHC : *Green Human Capital*

GSC : *Green Structural Capital*

GRC : *Green Relational Capital*

ENC : *Environment Consciousness*

SCA : *Sustained Competitive Advantages*

RESULT AND DISCUSSION

Description of Respondents

Respondents in this study were managers working in industrial companies that have environmental impact risk listed on the Indonesia Stock Exchange, including operational managers, financial managers, production managers, marketing managers, IT managers, and HR managers. The reason for selecting the manager sample, because the duties and functions of managers are responsible for sustainable competitive advantage while at the same time related to element of environmental concern. Managers sample respondents representing 72 companies are shown in table 1 below:

Company's	Amount	Percentage
Mining Sector		
Coal sub-sector	22	
Oil and Gas sub-sector	7	
Cement sub-sector	6	
Pulp and Paper sub-sector	9	
Sub Total	44	61,1%
Miscellaneous Industry Sector		
Textile and Garment sub-sector	18	25,0%
Consumer Goods Sector		
Pharmaceutical sub-sector	10	13,9%
Total	72	100,0%

Table 1.
Respondent

From the table above, the entities consist of 44 mining companies, 18 textile and garment companies, 10 consumer goods companies in the pharmaceutical sector, it can be seen that 61.1% of the respondents came from industrial companies in the mining sectors, 25,0% came from various industrial companies and the remaining 13.9% from the consumer goods sector.

Questionnaires Descriptions	Total	
	Questionnaires	Percentage
Questionnaire distributed	288	100,0%
Questionnaire no return	65	22,6%
Questionnaire incomplete	7	2,4%
Questionnaire valid and process	216	75,0%

Based on the table above, total of 288 questionnaires were distributed in this study with an estimate of 4 managers multiplied by 72 companies, but 223 were returned, but 7 questionnaires were declared incomplete.

Position	Respondents	Percentage
Operational Managers	23	10,6%
Financial Managers	31	14,4%
Marketing Managers	53	24,5%
Production Managers	60	27,8%
IT Managers	28	13,0%
HRD Managers	21	9,7%
Total	216	100,0%

Based on reliability testing to carry out tests regarding accuracy, consistency and accuracy of instruments in testing, carried out by testing: Cronbach's Alpha, and Composite reliability. The results of the reliability test are shown in table 2 below:

Constructs	Cronbach's Alpha	Composite Reliability
GHC	0.767	0.850
GSC	0.818	0.868
GRC	0.709	0.819
ENC	0.802	0.864
SCA	0.787	0.848
ENC*GHC	0.900	0.878
ENC*GSC	0.928	0.918
ENC*GRC	0.928	0.930

Table 2.
Result of
Realibility Test

The results of testing the full model of the influence of green intellectual capital which consists of the exogenous variables green human capital, green structural capital, green relational capital, and endogenous variables sustained competitive advantages, and then variable moderating is environmental consciousness can be seen on figure 2 below:

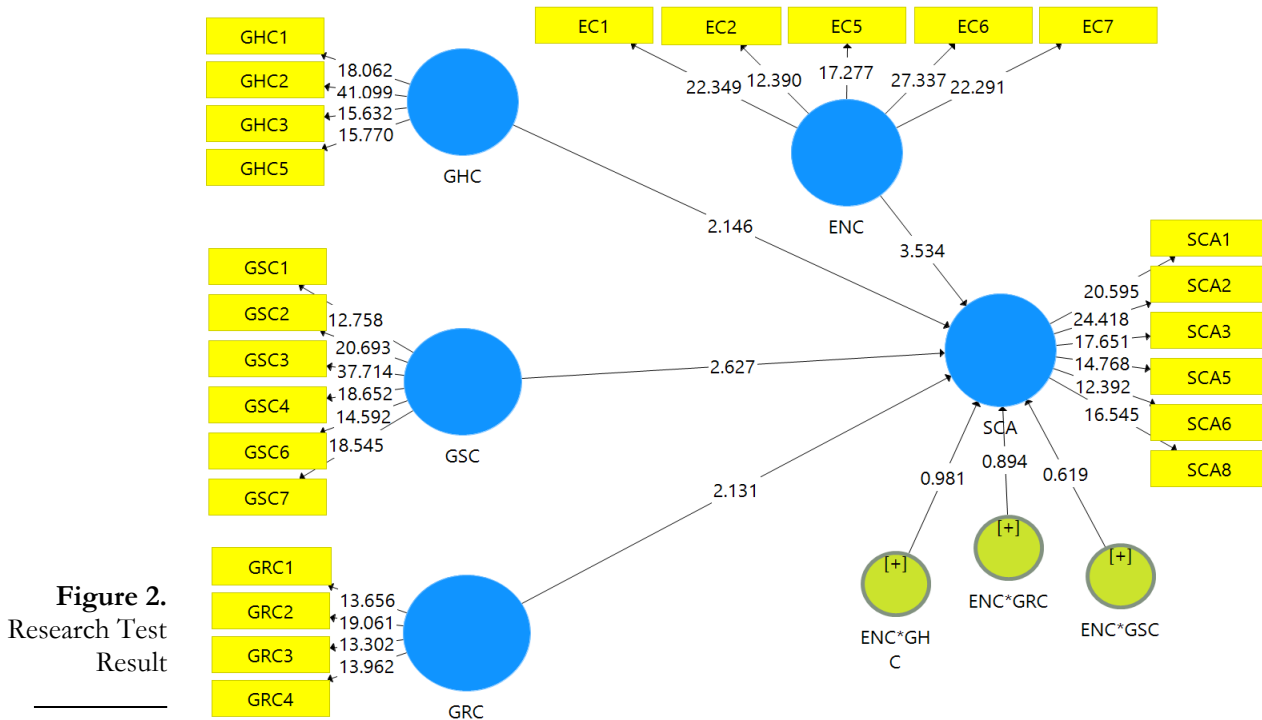


Figure 2. Research Test Result

Based on the test results in figure 1 above, the results of the research based on the hypothesis built in the study, shown in table 3 below

Hypotheses	Original Sample (O)	T-Statistics / t-value	Results
H1 The influence of Green human capital on Sustained Competitive Advantage.	0.141	2.146***	Supported
H2 The influence of Green structural capital on Sustained Competitive Advantage.	0.178	2.627**	Supported
H3 The influence of Green relational capital on Sustained Competitive Advantage.	0.170	2.131**	Supported
H4 The influence of Environmental consciousness on Sustained Competitive Advantage.	0.259	3.534***	Supported
H5 Environmental Consciousness strengthens the influence of Green Human Capital on Sustained Competitive Advantage.	-0.139	0.981	Unsupported
H6 Environmental Consciousness strengthens the influence of Green Structural Capital on Sustained Competitive Advantage.	0.075	0.619	Unsupported

H7	Environmental strengthens the Green relational Sustained Advantage.	Consciousness influence of capital on Competitive	-0.081	0.894	<i>Unsupported</i>
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Table 3.
Result of
Hypothesis
Test

Keterangan: *** signifikan pada 1%, ** signifikan pada 5%, * signifikan pada 10%.

The effect of green human capital on sustained competitive advantage

Based on table 3 above, the results of testing the hypothesis in this study, green human capital has a positive effect on sustained competitive advantage. Trained employees, timely service, competence, reliable teamwork, and support from company managers are key factors that must be attached to green human capital to carry out activities with the abilities, physical and intellectual strength they have. Resources in green human capital can maintain a sustainable competitive advantage. This study supports research conducted by (Chen, 2008), green human capital has a positive effect on sustainable competitive advantage. Thus the knowledge, skills, abilities, experience, attitudes, creativity and commitment inherent in employees can help companies achieve sustainable competitive advantage. he results of this study are in line with research conducted by Dzinkowski (2000) which states that a company's green human capital has a positive effect on a company's sustainable competitive advantage, besides that companies in environmental management and green innovation can actively not only minimize production waste and increase production, but can also set a relatively high price for green products, enhance the company's image, and thus can have a positive impact on sustainable competitive advantage. The role of managers is required to anticipate the trend of consumer awareness and strict international regulations on environmental awareness, on the knowledge, abilities, skills, experience, attitudes and creativity of employees regarding environmental awareness, this is what can help companies to gain a sustainable competitive advantage (Chen, 2006).

The effect of green structural capital on sustained competitive advantage

The results of testing the hypothesis in thie study, green structural capital has a positive effect on sustainable competitive advantage. Green structural capital is the company’s ability to fulfill the company’s routine processes and structures that support employee efforts to produce optimal intellectual performance and overall business performance. Green structural capital includes: company operating systems, technology adoption, production processes, organizational culture, management philosophy, and routines, highly dependent on changes in the industry structure and competitive environment. The results of this study support research conducted by Chen (2008) which states that green structural capital has a positive effect on sustainable competitive advantages. The application of technology, manufacturing processes, product distribution, management capabilities and skills, patents and brands must be relevant to the current conditions of industrial competition. In addition, the planned changes occur in a systematic and controlled manner, however, unplanned changes often occur due to chance in contexts caused by situational developments, several factors that cause changes in the industry such as: product innovation, production innovation, market innovation, consumer changes government policies,and changes in consumer lifestyles cause all components included in green structural capital to be required to increase sustainable competitive advantage. The results of this study support research conducted by Chen YS (2008) which states that green structural capital has a positive effect on sustainable competitive advantages. The application of technology, manufacturing processes, product distribution, management capabilities and skills, patents and brands must be relevant to the

current conditions of industrial competition. Chen (2006) further explains the emergence of consumer awareness trends and stringent international regulations on environmental protection, causing all components included in green structural capital to be required to increase environmental awareness in order to gain a sustainable competitive advantage.

The effect of green relational capital on sustained competitive advantage

The results of testing the hypothesis in this study, green relational capital has a positive effect on sustainable competitive advantage. The main problem faced by the company is the lack of stakeholder trust and cooperation with the company. If the company is able to develop relationships with stakeholders based on mutual trust and cooperation, it can be used as a strategy to formulate objectives to achieve sustainable competitive advantage. The results of this study support the research conducted by Christos and Victoria (2013), namely by promoting environmentally friendly products, customer satisfaction is a company's interactive relationship with customers, suppliers, network members and strategic partners. This essence can have a positive impact on sustainable competitive advantage. According to stakeholder theory, the main problem faced by companies is the lack of trust and cooperation of stakeholders with the company. The strategy to overcome this is to manage relationships with stakeholders. Companies will gain a sustainable competitive advantage, if they are able to develop relationships with stakeholders based on mutual trust and good cooperation, therefore, environmental awareness related to stakeholders can be used as a strategy to formulate goals to achieve sustainable competitive advantage. Besides that, efforts to promote environmentally friendly products, customer satisfaction is the company's interactive relationship with customers, suppliers, network members and strategic partners, this essence can have a positive impact on sustainable competitive advantage (Christos and Victoria, 2013).

The results of this study support the research conducted by Chen YS (2008) which states that green relational capital has a positive effect on sustainable competitive advantages. Thus building interactive relationships with customers, suppliers and strategic partners of the company can help the company to create a sustainable competitive advantage.

The effect of environmental consciousness on sustained competitive advantage

The results of testing the hypothesis in this study, environmental consciousness has a positive effect on sustainable competitive advantage. The results of this study support research conducted by Campopiano and De Massis (2015) that in line with increasing public attention to environmental consciousness elements, companies take the initiative and continue to seek to disclose information about environmental consciousness that is being carried out, in line with increasing environmental consciousness this can enable company to generate moral capital and maintain a sustainable competitive advantage. The results of this study also support research conducted by Djajadikerta and Trireksani (2012); Purwanti et al (2022), that environmental consciousness information carried out by companies is very important to get a positive image and public credibility which in turn will be able to maintain a sustainable competitive advantage.

Environmental consciousness strengthens the influence of green human capital on sustained competitive advantage

The results of testing the hypothesis in this study, environmental consciousness does not moderate the influence of green human capital on sustainable competitive advantage. Lack of awareness of the environment is shown by the low implementation of green human capital in Indonesia. There are still many industrial companies in Indonesia that have not

realized the importance of implementing the concept of environmental consciousness in their activities, the lack of behavior of employees to be environmentally friendly in the work environment is indicated by energy-intensive activities. The Ministry of Energy and Mineral Resources of the Republic of Indonesia States that 80% of energy wastage is caused by the human factor. From these publications it appears that energy wastage still occurs in manufacturing companies in Indonesia. This reflects that the behavior of environmental consciousness has not been realized by many parties. So it is necessary to implement human resource management with the concept of environmental consciousness. Although research conducted by Hsun Chang, (2012) states that environmental consciousness moderates the influence of green human capital on sustainable competitive advantage, the results of this study are not proven. So that a study is needed to carry out a comprehensive identification of the process of implementing environmental consciousness behavior, in the sense that research is needed that examines environmentally friendly behavior in organizations as a whole, with various factors related to the implementation of environmental consciousness behavior both externally and internally in the company.

Environmental consciousness strengthens the influence of green structural capital on sustained competitive advantage

The results of testing the hypothesis in this study, environmental consciousness does not moderate the influence of green structural capital on sustainable competitive advantage. The investment made by companies in terms of environmental consciousness is in fact only aimed at avoiding legal problems regarding environmental protection. The investment should have further objectives to enhance the company's image, improve production efficiency, develop the market environment, in order to enhance sustainable competitive advantage. Related to organizational capabilities, information technology systems, organizational commitment, manufacturing processes, managerial philosophy, organizational culture, and other components included in green structural capital refer to environmental consciousness. The results of this study do not support research conducted by Hsun Chang (2012) which states that environmental consciousness moderates the influence of green structural capital on sustainable competitive advantage.

Environmental consciousness strengthens the influence of green relational capital on sustained competitive advantage

The results of testing the hypothesis in this study environmental consciousness does not moderates the influence of green relational capital on sustainable competitive advantage. Based on the company performance rating assessment carried out by the Ministry of Environment and Forestry in 2019, there were still 303 companies that received a red rating, meaning that these companies in terms of environmental management did not comply with the requirements stipulated in the legislation, and 2 companies received a black rating means that the company deliberately violated regulations which resulted in environmental pollution (Suara Pembaruan, 9/1/2020). The Government regulations related to the environment include Law No. 24 of 2007, Law No.40 of 2007, Government regulation of Republic of Indonesia No. 47 of 2012. This government regulation is still limited in its application to Limited Liability Companies relating to natural resources. Although this government regulation is mandatory for limited liability companies related to natural resources, it is still voluntary for companies, as a result there are still very few companies compiling sustainability reporting in Indonesia, which is around 9% of companies listed on the Indonesia Stock Exchange. The results of this study do not support research conducted by Hsun Chang, (2012) which states that environmental consciousness moderates the influence of green

relational capital on sustainable competitive advantage. However, it remains a concern for companies that are classified as high-profit sensitive industries to play a greater role in increasing corporate environmental consciousness, especially in the mining sector, various industrial sectors, and consumer goods sector.

CONCLUSION

The empirical study has several conclusions, which can be presented as follows: Green human capital has a positive influence on sustained competitive advantages. It can be concluded that trained employees, timely service, competence, reliable teamwork, and support from company managers are key factors that must be attached to green human capital to carry out activities with their abilities and intellectual abilities, so that to maintain a sustainable competitive advantage. Green structural capital has a positive influence on sustained competitive advantage. It can be concluded that the emergence of consumer awareness tendencies and the existence of strict in international regulations on environmental protection have caused all components included in green structural capital to be required to increase environmental consciousness. Green relational capital has a positive influence on sustained competitive advantage. It can be concluded that efforts to promote environmentally friendly products, customer satisfaction is the company's interactive relationship with customers, suppliers, network members and strategic partners. Environmental consciousness has a positive influence on sustained competitive advantage. It can be concluded that environmental consciousness information carried out by companies is very important to get a positive image and public credibility which in turn will be able to maintain a sustainable competitive advantage. Environmental consciousness does not moderate the influence of green human capital on sustainable competitive advantage, this reflects that low environmental consciousness is indicated by the low implantation of green human capital on environmental consciousness in the industrial sector in Indonesia. Environmental consciousness does not moderate the influence of green structural capital on sustainable competitive advantage, this reflects that the investment made by companies in terms of environmental consciousness is not only aimed at avoiding legal problems regarding environmental protection, but also aims to improve the company's image. Environmental consciousness does not moderate the influence of green relational capital on sustained competitive advantage, this could be the attitude of the government to implement regulations related to environmental awareness for all companies listed on the Indonesia Stock Exchange. Given that Indonesia faces serious environmental challenges related to water and air pollution, waste management, climate change, loss of biodiversity, and depletion of natural resources, caused by rapid economic development, urbanization, and increasing global demand for commodities.

Limitation

Limitation of population and sample responses

The data source in this study is primary data using a questionnaire instrument that describes the opinions and perceptions of managers as respondents. Although in this study, the respondents were managers who worked relatively long in their companies who should understand the conditions of their companies, this research still requires an in-depth study, so it requires secondary data as supporting data to prove results that are close to the real situation. Weaknesses of primary data cannot be generalized, the results can only see events at the time of data collection. And in terms of processing time, primary data collection is much longer than secondary data. Weaknesses of primary data include: Respondents are often not thorough in answering, so that there are statements that are not answered, even

though it is difficult to repeat for opinions, sometimes respondents give answers that are not honest, and the collection time is relatively long. While the weaknesses of secondary data are: if you are not careful, mistakes in quoting data, besides that if the source of the data makes an error, or is no longer relevant, it can affect the results of the study.

Implication for Further Research

For future researchers, especially those discussing green intellectual capital and sustainable competitive advantage as well as elements of environmental consciousness, the results of this study can be used as a reference, as material for consideration for further research to develop statement items in a more comprehensive respondent's questionnaire, especially those concerning the three components of green intellectual capital, namely green human capital, green structural capital and green relational capital. In addition, further research can also use a larger number of samples and respondents to prove the influence of the three components of green intellectual capital on sustained competitive advantage. In addition to using primary data, further researchers can use secondary data as supporting data.

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