Environmental Consciousness and Corporate Social Responsibility as Drivers of Green Intellectual Capital

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The objective of this study is to examine the influence of corporate social responsibility and environmental consciousness on green intellectual capital, which consists of green human capital, green structural capital, and green relationship capital. In this research, questionnaires were distributed to collect data. The questionnaires were processed using structural equation modelling. The result of this study showed that corporate social responsibility has a positive effect on green human capital, green structural capital, and green relationship capital, whereas environmental consciousness has a positive effect on green human capital and green structural capital, but not on the dimension of green relationship capital.

Introduction

The main goal of companies doing business is obtaining profit and increasing their income from year to year to achieve growth. For this reason, companies often try to expand their own market because of the competition. Expansion can be done by buying fixed assets, such as land, building, new factory, equipment, merger, and others. However, nowadays, investing in fixed assets is not enough: companies also need to consider society and the environment.

Many companies try to invest, not only on fixed assets or tangible assets, but on intangible assets as well (Chen, 2008). Brand, goodwill, workers' competence, technology and relationship with shareholders are important aspects that companies are urged to direct a lot of money towards. Investing in intangible assets is one of the key factors for companies to win the market (Chang and Chen, 2012).

Investing in knowledge is important and will improve the intellectual capital of the firm, as part of knowledge management. Examples of intellectual capital are knowledge of technology, knowledge of workforce management and knowledge of environment. Knowledge of environment is known as green intellectual capital, and is important because governments have created regulations for companies to manage and improve the environment. The government also has the responsibility to create awareness. It should be mandatory, but some companies still do not follow the rule and do not produce reports for disclosing such actions.

One of the ways to invest in green intellectual capital is corporate social responsibility (CSR), which is a company's gratitude toward society and all of the stakeholders because without them, companies cannot survive in the market. One of the forms of CSR is to manage the environment and to protect from the dangers of pollution, through efforts such as recycling wastewater, reducing air pollution by planting trees and others. Sometimes CSR is also used as a strategy by a company to improve business. A company which recruits people surrounding the company to improve their living standards is considering external stakeholders while doing CSR. Measures to consider internal stakeholders through CSR include by paying fair salaries, providing paid days off for illness and maternity leave. Multinational firms sometimes consider giving scholarships to their employees' children.

Another way to implement better green intellectual capital is by considering environmental consciousness (EC). A good environmental consciousness will make companies be careful while making decisions about the environment, such as waste management, pollution reduction and others. Companies will make do research in an attempt to most efficiently manage the environment, through reducing waste water, recycling water, conserving electricity and reusing materials. This is at the insight of the manufacturing process. Government has the responsibility to set the regulations and rules to direct companies to conduct green manufacturing. From customers perspectives, they consider buying green products from the company. Insights into environmental consciousness from the stakeholders also consider pro-environmental behaviour (Sharma and Bansal, 2013).

Green intellectual capital is measured by three determinants. Those are green human capital, green structural capital and green relationship capital. Green human capital is defined as workers' ability, knowledge, creativity, consciousness and commitment for environmental management (Chen, 2008; Chaudhry et al., 2016). Green structural capital is defined as companies' patent, hardware, software, data, culture and capability for environment management (Chen, 2008; Chaudhry et al., 2016). Green structural capital is defined as the relationship between the companies and their stakeholders about environmental management (Chen, 2008; Chaudhry et al., 2016).

There are several studies related to green intellectual capital, including those that conclude that CSR and EC have a positive effect on green intellectual capital (Chen, 2011; Huang and Kung, 2011). According to Chaudhry et al. (2016), EC has a positive effect on green intellectual capital and financial performance. Chang and Chen (2012), Chen (2011) and Huang and Kung (2011) conducted this research in Taiwan which has higher human capital and is considered in the very high category of the Human Development Index. Indonesia is included in the medium category in the Human Development Index. Chaudhry et al. (2016) researched in Pakistan, which is considered a developing country like Indonesia, but their research did not test the dimension of green intellectual capital in each dimension. The contribution of this research tested each dimension of green intellectual capital, in order to have the insight of each dimension.

This study is an adoption of Chen and Chang's (2012) study as the variables used are similar. However, there is a geographical distinction as this study is conducted in Indonesia which is considered to be one of the rapidly developing countries. This research is being conducted to determine if the result might be different between developed and developing countries. The finding will contribute to future research.

The purpose of this study is to know the influence of: (1) CSR to green human capital; (2) CSR to green structural capital; (3) CSR to green relationship capital; (4) EC to green human capital; (5) EC to green structural capital; and (6) EC to green relationship capital.

Literature Review and Hypothesis Development

Corporate Social Responsibility (CSR)

CSR is the obligation of companies to take action to protect and to improve the welfare of the society which is thought of as their interests (Chang and Chen, 2012; Davis and Blomstrom, 1975). Companies need to conduct CSR to all their stakeholders to ensure their sustainability, as no company can exist without the help of the stakeholders. For example, without having any supplier companies, they will not have the materials needed to manufacture their product. Shareholders are also an important factor as they make sure a company continues running by financing its activity. Without the shareholders, the companies will also be unable to expand their own market. Another example is a company which provides green products and green services as one of its CSR efforts as some customers would prefer to help environment sustainability. In short, CSR is the companies' expression of gratitude toward their stakeholder.

Environmental Consciousness (EC)

Environmental consciousness is defined as the perception of an organisation, group, or individual about environmental concepts such as environmental protection, environmental policy, environmental management and environmentalism (Chaudhry et al., 2016; Ahmed et al., 1998). Environmental consciousness can help companies to strengthen the process of environmental management and fulfil regulations issued by the government.

Green Intellectual Capital

Intellectual capital is defined as the total stock of collective knowledge, information, technologies, intellectual property rights, experience, organisation learning and competence, team communication systems, customer relations and brands that create value for firms (Stewart, 1994). Intellectual capital is important for the companies to strengthen their power to compete. The popularity of environmentalism is so strong that environmental management became an important factor to discuss by companies. Thus Chen (2008) suggests a green intellectual capital concept, which is defined as total stock of all kinds of intangible assets, knowledge, capabilities and relationships about environmental protection or green innovation of both the individual and organisation levels within a company. Subsequently, Chen (2008) suggests the three determinants of green intellectual capital, which are green human capital, green structural capital and green relationship capital.

Green Human Capital (GHC)

Green human capital is defined as the summation of employees' knowledge, skills, capabilities, experience, attitude, wisdom, creativity and commitment regarding environmental protection or green innovation (Chen, 2008).

Green Structural Capital (GSC)

Green structural capital is defined as the stock of organisational capabilities, organisational commitments, knowledge management systems, managerial philosophies, organisational culture, company images, patents, copy rights, and trademarks about environmental protection or green innovation within a company (Chen, 2008).

Green Relationship Capital (GRC)

Green relationship capital is defined as the stocks of a company's interactive relationships with customers, suppliers, network members, and partners about corporate environmental management and green innovation (Chen, 2008).

Methodology and Measurement

Data Collection and Sample

This study uses a questionnaire survey method to verify the hypotheses and focuses on the manufacturing industry in Bandung. Respondents are top-level managers, CEOs, or managers of manufacturing, R&D, marketing, human resource management, or environmental protection departments, or those who have worked there for at least three years. This research used purposive convenience sampling. Since some of the company chosen did not give permission for distributing questionnaires, this study decided to share to the respondents who will be able to fill in the questionnaires. Respondents are top-level managers, CEOs, or managers of manufacturing, R&D, marketing, human resource management, or environmental protection departments, or the those who have worked there for at least three years. The reason for choosing that length of time spent with the company is that workers who have been with the company for at least five years already understand the companies' goal and culture. This study sent 550 questionnaires to the respondents and 192 were able to be collected. There are 130 valid and 52 invalid questionnaires, so the effective response rate is 23.6 percent.

Measurement

The measurement of the questionnaire items in this study is conducted through the use of a "six-point Likert scale from 1 to 6", rating from strong disagreement to strong agreement, respectively. The measurement is adopted from Chen and Chang (2012). The measurements of the CSR constructs consist of five items. Environmental consciousness constructs consist of four items. While green intellectual capital has three dimensions of GHC consisting of five items, GSC consists of six items and GRC consists of three items (Chang and Chen, 2012).

Empirical Results

This study uses structural equation modeling (SEM) to verify the research framework and hypotheses, and applies Amos 7.0 to obtain the empirical results. SEM is a statistical technique for testing and estimating causal relationships. The antecedent of in this study is CSR, and the consequent is green human capital, green structural capital and green relationship capital, while environmental consciousness is a mediator between CRS and three types of green intellectual capital. SEM of this study includes two levels of analysis – the measurement model and the structural model.

Results of the Measurement Model

Table 1 shows the mean of respondents' answers, standard deviation, minimum, maximum, and total data.

Table 1: Descriptive statistics

Construct/variable	N	Min	Max	Mean	Std. Deviation
CSR	130	1	6.00	4.9277	0.75123
Environmental consciousness	130	1	6.00	4.8904	0.70299
Green human capital	130	1	6.00	4.9215	0.66845
Green structural capital	130	1	6.00	4.9872	0.68722
Green relationship capital	130	1	6.00	5.1487	0.74253

As seen in Table 1, the standard deviation value of all constructs is below 1 which shows that the respondents' answers are not spread out.

The Cronbach's Alpha of all constructs is higher than 0.6, and are fulfilling the minimum requirements of reliability criteria recommended. Thus, it is concluded that all of the respondents' answers to measure the variables are reliable.

Result of Structural Model

The model of this study generated by SPSS AMOS 23 can be seen in Figure 1.

The model must be tested in order to ascertain whether the model is a good fit. Using the criteria of goodness-of-fit that are shown in Table 2, we conclude that the model is fit. Judging from Table 2, almost all the criteria of the goodness-of-fit test are concluded to have a good fit. In conclusion, the model is a good method to explain the theory.

Figure 1. Research model
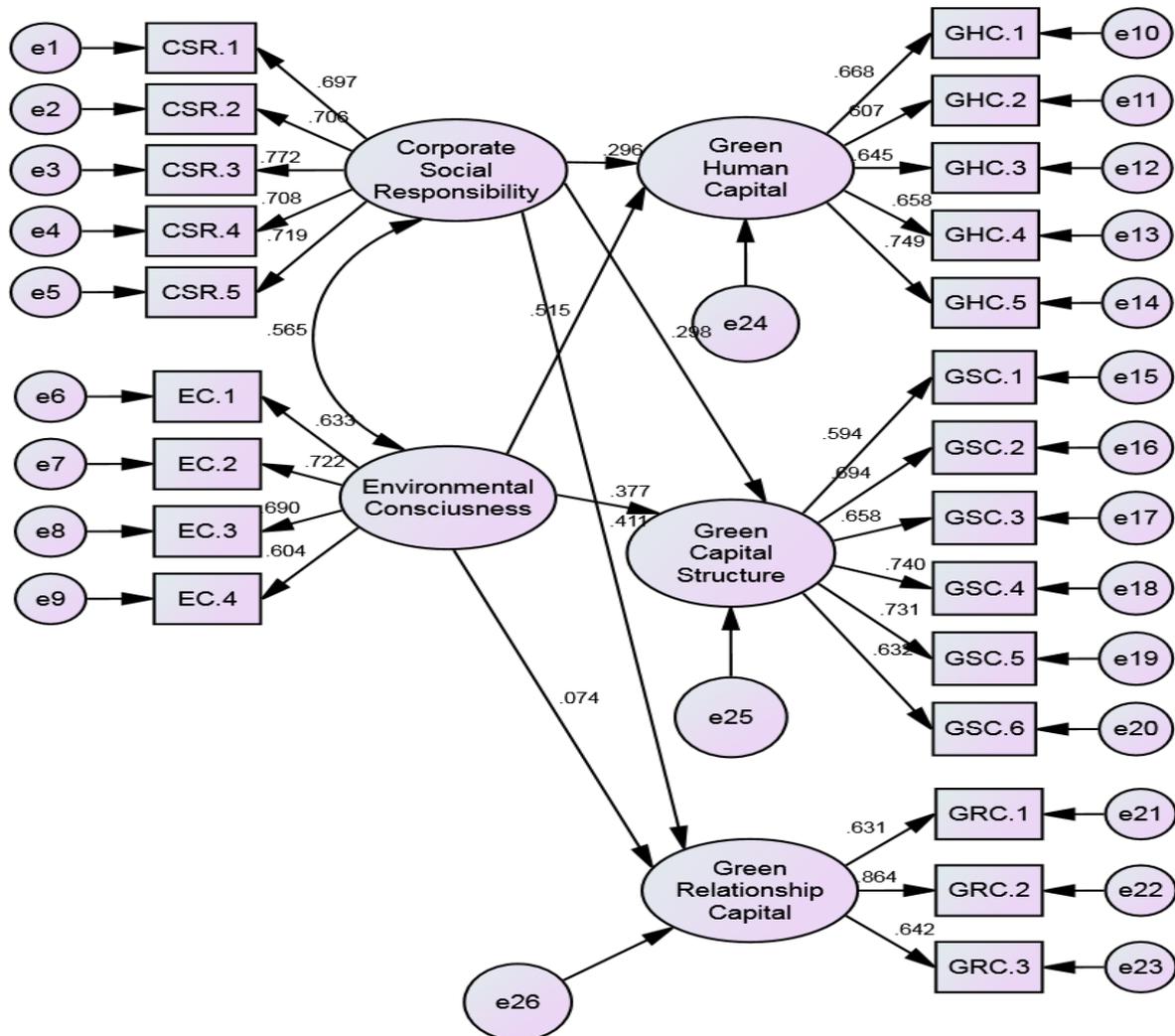
Table 2: Test of goodness of fit

Type of measurement	Measurement	Value	Expected value	Conclusion
Absolute fit measures	*Chi-square*	271,241	*p-value > 0,05*	*Poor fit*
	p-value	0,015		
	GFI	0,853	> 0,90	*Fit*
	RMSEA	0,041	< 0,08 – 0,10	*Fit*
Incremental fit measures	*AGFI*	0,818	> 0,90	*Marginal fit*
	TLI	0,947	> 0,90	*Fit*
	IFI	0,954	> 0,90	*Fit*
	CFI	0,953	> 0,90	*Fit*
Parsimonious fit measures	*Normed Chi-Square* (CMIN/DF)	1,216	Lower limit : 1 Upper limit : 5	*Fit*

Hypothesis Test

Probability in the critical ratio is used to test the hypothesis in SEM modeling. The coefficient can be seen in standardized weight value. Table 3 shows the result of the test.

Table 3: Hypothesis testing

			Estimate
Green_Human_Capital	<---	Corporate_Social_Responsibility	.296
Green_Structural Capital	<---	Corporate_Social_Responsibility	.298
Green_Relational_Capital	<---	Corporate_Social_Responsibility	.411
Green_Human_Capital	<---	Environmental_Consciousness	.515
Green_Structural Capital	<---	Environmental_Consciousness	.377
Green_Relational_Capital	<---	Environmental_Consciousness	.074

Hypothesis 1. *CSR has a positive effect on GHC.* From table 3, the p-value of CSR to GHC is 0.015, lower than the alpha (0.05). It means that CSR has a positive effect on GHC because the company provides fair job opportunities for employees. In addition, the company provides a suitable working environment, so that employees are satisfied working at the company. Furthermore, the company gives good welfare to employees and their families, so that the family of the employee has a good life expectancy.

For the external stakeholders, the company produced reliable and safe products and services for customers, so that the company received valuable and beneficial products. The company follows the rules and regulations and consider ethics, so that society feels positive impacts from the operation of the company. While the company recruits employees, the surrounding society will gain positive impacts. The other external stakeholders such as suppliers will be paid with fair profit and timely payment.

Hypothesis 2. *CSR has a positive effect on GSC.* Table 5 shows that the p-value of CSR to GSC is 0.020, lower than the alpha (0.05). This means that CSR has a positive effect on GSC, because of the creation of new products such as hybrid products can be produced if the company has increased the R&D program. Other environmental policies together with R&D are the structural capital of the firm. By having R&D the company also produces safe and secure products which will satisfy customers.

Hypothesis 3. *CSR has a positive effect on GRC.* In Table 5, the p-value of CSR to GRC is 0.005, lower than the alpha (0.05). Therefore, we can conclude that CSR has a positive effect on GRC. It means that the CSR program sometimes has relationships with employees, customers, suppliers and society. By implementing a CSR program, the company concerns

itself with how to satisfy the employee by providing good working conditions or environment and paying favourable salaries to employees, so that they can support their family.

Hypothesis 4. *EC has a positive effect on GHC.* The p-value of EC to GHC is 0.000, lower than the alpha (0.05). Therefore, we can conclude that EC has a positive effect on GHC. Some reasons might be environmental consciousness will drive human capital to become more aware with green activities such as fuel reduction, water reduction, material reduction and proposal of green strategies which can be more efficient and effective than the competitors. These regulations, policies and management systems are also competitive to the advantage of the firm.

Hypothesis 5. *EC has a positive effect on GSC.* In Table 5, the p-value of EC to GSC is 0.007, lower than the alpha (0.05). Therefore, we can conclude that EC has a positive effect on GSC. Environmental consciousness drives the leader of the firm to create environmental policy and environmental management systems as green structural capital, which support the implementation of green activities.

Hypothesis 6. *EC has a positive effect on GRC.* Seeing the table 5, the p-value of EC to GRC is 0.585, higher than the alpha (0.05). Therefore, we can conclude that EC doesn't have a positive effect on GRC. Why? The reason is that environmental consciousness does not help in building relationships.

Conclusion and Implication

Conclusion

The conclusions of the study are:
1. CSR has a positive effect on GHC, GSC with the same effect, but more strongly to GRC. CSR activities will build and drive good relationship with stakeholders.
2. EC has a positive strong effect on GHC, while only the same effect from GSC and GRC. Not many companies in Indonesia have the same policy. Sometimes they cannot consider the environment and society since the companies do not support these causes with enough money.

Managerial Implication and Research Opportunity

The company should know that undertaking CSR and having a good EC will bring a lot of benefits to the company, because it can strengthen the green intellectual capital of the company. There is an exception about having a good EC doesn't ensure that the company will have a good GRC. Nevertheless, investing in green intellectual capital by having a good

EC and undertaking CSR will be a good investment in intangible assets. For future research, it is hoped that the researchers will use more real data, for example by using annual reports, and that the questionnaire is also accompanied with interviews so the data will become more accurate.

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