Green Innovation as Implementation of Sustainability Development in Indonesia

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Keywords: Green Innovation, Sustainability Development, Firm Value.

Abstract: This research is conducted to examine the application of green innovation as implementation of Sustainability Development in Indonesia and to know the effect of green innovation to firm value. Green innovation will increase the firm value, increase the economic benefits, and improve the competitiveness of the company which will ultimately help the company to reach the point of sustainability. The data used are secondary data that is company's annual report and PROPER report of manufacturing sector and main sector listed on IDX year 2012-2015. Sample determination was done by sampling technique with certain criteria and was obtained 277 companies. Independent variable in this research is green innovation measured by content analysis. The dependent variables are firm values measured using Tobins Q. This study also discusses the application of green innovation as implementation of sustainability development in Indonesia. The result of this study indicates that green innovation has positive effect on firm value.

1 INTRODUCTION

Sustainability development is a long-term development and taking into account the interests of future generations by trying to use resources adequately and create healthy environment. Environmentalists are now beginning to change their lifestyles as an effort to reduce environmental damage. They are beginning to shift from consuming unsustainable products to more environmentally friendly products (green product). This is due to increased awareness and acknowledgement that one of contributors to environmental damage is product that cannot be reused or recycled.

Green innovation is one of the environmental strategies that can be undertaken to develop a business without violating government regulations (Özşahin et al., 2013). An innovative green product innovation strategy will encourage companies to have special capabilities that will ultimately be a source of corporate competitive advantage (Sharma and Vredenburg, 1998). This competitive advantage will increase the value of the company in the future (Bech, 2013). High corporate productivity will increase company's profit margin and will help companies to grow faster and enhance the competitiveness of

companies that will ultimately help companies to achieve sustainability.

Based on the description of background above, problems in this study can be formulated as follows:

- How is application of green innovation as implementation of Sustainability Development in Indonesia?
- Does green innovation affect firm value in public companies in Indonesia?

2 LITERATURE REVIEW

2.1 Sustainability Development

Resources available in nature are limited in number, while human needs are endless. More effort is needed to maintain environmental sustainability. There are four important components in establishing environmental sustainability namely economic stability, social stability, environmental stability, and culture stability (Scrimgeour and Iremonger, 2011).

In running the business process, a company must be able to generate economic benefits as much as possible according to its main objectives, but the company must also be able to provide welfare for the

people around the plant and able to maintain environmental sustainability.

2.2 Green Innovation

Innovation is an important thing for companies to develop business processes. Innovation can be the tool that will deliver the company to gain certainty of sustainability. Green innovation or environmental innovation is a new or modified technique, practice, system and production process to reduce the impact of environmental damage (Rennings and Rammer, 2009). Green innovation is also defined as new technology (hardware or software) related to products or production processes that will lead to energy efficiency, pollution reduction, waste recycling, green product design, and corporate environmental management (Ar, 2012). Green innovation not only aims to improve firm performance economically, but also to reduce the negative impact on the environment and create a competitive advantage for the company. Another advantage of green innovation is to encourage companies to convert waste production into a product that is worth selling so that it can generate additional profits for the company.

2.3 Firm Value

The main objective of the company is to maximize the company's wealth or value for shareholders or owners (Ross et al., 2008: 9). Value of company is investors' perceptions of the company's success rate. For companies that have gone public, the value of the company can be reflected through the company's stock price, while for the company that has not gone public its value is reflected through the realizable value of the company's assets at the time the company will be sold (Margaretha, 2005: 1). High stock prices make value of the company also high. High value of the company will make the market believe not only in company's current performance but also on future prospects of the company.

In general, company value can be measured by market value ratio. The market value ratio is the ratio that correlates the firm's share price with its profit and with the book value of the company (Margaretha, 2011: 27). This ratio gives an indication to management relating to investors' opinions about past corporate achievements and future prospects.

3 RESEARCH METHOD

3.1 Research Approach

The research approach used in this research is quantitative approach. The method used in this research is at the level of explanation. This study identifies the relationship between application of Green Innovation as implementation of Sustainability Development in Indonesia and firm value.

3.2 Operational Definitions

The independent variable in this research is Green Innovation (X). In this study, green innovation is a variable obtained through content analysis in the company's annual report. Some indicators will be used to determine whether the company has applied green innovation. The study was conducted by Ar (2012) and Qamarullah and Dorina (2015). The indicators to be used in content analysis are as follows:

Table 1: Variable assessment indicator.

Variable	Indicators
Green Innovation	The product uses non-polluting or non-hazardous substances (environmentally friendly materials)
	Using an eco-friendly product wrap (example: paper and plastic only in small amount)
	Components or materials in the production process can be recycled or reconditioned
	The production process uses new technologies to reduce energy, water, and waste

Dependent variable in this research is firm value. Firm value is stakeholder perception, especially investors to company's success rate which is associated with stock market price and measured by percentage. Firm value in this research is measured by using Tobins'Q ratio. Tobin's Q Ratio is calculated by the following formula (Chang and Wang, 2007):

$$Q = \frac{(OS \times P) + (D+1) - CA}{(TA)}$$

In which:

OS   = Outstanding share

P   = Stock Price

D   = Total Debt

I   = Inventory

CA   = Current Asset

TA   = Total Asset

3.3 Population and Sample

The population in this research is companies in the manufacturing sector and the main sector listed in Indonesia Stock Exchange (IDX) starting from 2012-2015 which are as many as 287 companies. Determination of sample in this research is done by using certain consideration. The prescribed criteria are as follows: a. The annual reports of manufacturing and main sector companies are published on the Indonesia Stock Exchange from 2012 to 2015 and register PROPER programs for three consecutive years. b. Companies in manufacturing sector and main sector present complete and related data to the research variables.

Out of 287 companies that publish the financial statements in IDX since 2012 until 2015, there are 277 companies that meet the criteria set.

3.4 Analysis Technique

This descriptive statistic will be used to describe statistically the variables in this study. Normality test in this study is using Kolmogorov-Smirnov test. In Kolmogorov- Smirnov test if significance > 0.05 then the data is normally distributed (Ghozali, 2013: 164).

The equation obtained from simple regression result is:

$$Y = a + bX$$

Y = Firm Value

a = constants

b = direction of regression coefficient

X = Green Innovation

4 RESULTS AND DISCUSSION

4.1 Model Analysis

This study uses a simple regression model. Normality test is done by using Kolmogorov-Smirnov test by looking at the level of significance. The residual is otherwise normally distributed if the significance value of Kolmogorov-Smirnov > 0.05. Normality test result is shown in table 2 below:

Table 2: Normality test result on initial data one-sample Kolmogorov-Smirnov test.

		Unstandardized Residual
N		277
Normal Parameters[a,b]	Mean	0E-7
	Std. Deviation	2.56189371
Most Extreme Differences	Absolute	.239
	Positive	.239
	Negative	-.204
Kolmogorov-Smirnov Z		3.982
Asymp. Sig. (2-tailed)		.000

Source: Processed data, 2017.

The result of normality test in table 2 shows that the value of Kolgomorov-Smirnov is 3,982 and asymp. Sig. (2-tailed) of 0.000. This indicates that the distribution of data is not normal. Therefore, it is necessary to normalize the data by eliminating the outlier value of the data by doing the elimination of data that has the highest residual value.

Table 3: Normality test result on final data one-sample Kolmogorov-Smirnov test.

		Unstandardized Residual
N		208
Normal Parameters[a,b]	Mean	0E-7
	Std. Deviation	.49050040
Most Extreme Differences	Absolute	.086
	Positive	.086
	Negative	-.037
Kolmogorov-Smirnov Z		1.245
Asymp. Sig. (2-tailed)		.090

Source: Processed data, 2017.

Normality test results after normalization of data has been presented in Table 3. The result of normality test shows that the value of Kolgomorov-Smirnov was 1,245 and asp. Sig. (2-tailed) of 0.090. Therefore, it can be concluded that the residual data of both models has been normally distributed as indicated by the value of asymp. Sig. (2-tailed)> 0.05 or said to be significant.

4.2 Hypothesis Proof: Effect of Green Innovation on Firm Value

Table 4 below is the result of multiple linear regression for model 1:

Table 4: Results of linear regression analysis coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.619	.050		12.421	.000		
	GI	.060	.025	.141	2.361	.019	.939	1.064
	.313							
Koefisien Determinasi R2				.313				

Dependent Variable: TOBINS

From result of data analysis, hence result of structural equation is as follows:

Firm Value = 0.619 +0.141 GI +e

Based on the result in Table 4.3, it can be concluded that green innovation has significant effect on firm value. It can be seen based on the value of green innovation significance of 0.019 which is less than the significance level of 0.05. The positive sign on the beta coefficient of 0.141 indicates that green innovation positively affects the firm value. Test of Coefficient of Determination (R^2) generates result of .313 or 3.13%. With this result, it can be concluded that is firm value is able to explain independent variable of green innovation equal to 3.13%.

4.3 Discussion

4.3.1 Green Innovation as Implementation of Sustainability Development in Indonesia

Subject of this research is companies in the manufacturing sector and the main sector listed on the Indonesia Stock Exchange (IDX) and follow the Program Performance Rating Company in Environmental Management (PROPER) in the period of observation in 2012 until 2015.

According to the Regulation of the Minister of Environment Number 18 year 2012, PROPER ratings are grouped into 5 ranking colors with 5 categories, where each rating reflects the company's performance. The best structuring performance sequentially is Gold (PROPER 5) and Green (PROPER 4); Blue (PROPER 3), given to the business that have undertaken environmental management efforts in accordance with the requirements as stipulated in the regulation. Then Red (PROPER 2), while the worst environmental performance is black. Gold (PROPER 5), awarded to a business that has consistently demonstrated environmental excellence in the production and/or serving process, conducting ethical business, and is responsible to the community.

Based on the results of research in table 4.1, Green innovation has the lowest value of zero (0) which means the company has not made innovations or renewal activities in order to reduce the impact of environmental damage, both in terms of operational processes and the final product. There are 117 companies that have not done green innovation or equal to 42.23% of the total samples. The highest value of green innovation is 4 which means the company has fulfilled all criteria in doing green innovation both for the process and final product. The company that has done the perfect green innovation is PT. Semen Indonesia Tbk, PT. Medco Energy Tbk., PT. Holcim Indonesia Tbk., PT. Pelat Timah Nusantara Tbk, PT. Asahamimas Flat Glas Tbk, PT. Kalbe Farma Tbk, PT. Ultrajaya Milk Industri Tbk, PT. Sampoerna agro Tbk, PT. Indofood Sukses Makmur Tbk.

Overall, the average value of green innovation in the sample company is 1.34 with a standard deviation of 1.41. This shows that the spread of green innovation data has a variation rate of 105%.
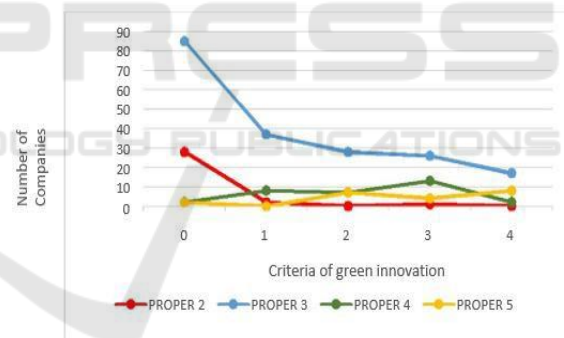

Figure 1: Graph of PROPER 1, 2, 3, 4, 5 on green innovation.
Source: Processed data, 2017.

Based on Figure 1 and table 5 above, the Company PROPER 1 (black) does not exist due to not entering sample research. Company PROPER 2 (red) consists of 31 companies. The result of the company PROPER 2 (red) is linear that the lower the PROPER rank, the lower the green innovation level the company performs.

Company PROPER 3 (blue) is the majority consisting of 193 companies. Companies rated PROPER 4 (green) consists 32 companies. Companies incorporated in the PROPER 4 (green) rankings proved quite concerned about the use of environmentally friendly products and production

processes. It can be seen from the number of companies. Most are found in number 3 which is the company has made 3 of 4 criteria of green innovation.

Companies that are ranked PROPER 5 (gold) are 21 companies. This indicates that the number of companies listed in PROPER 5 (gold) has been concerned deeply for green innovation as proven by the most number of companies that do all the green innovation criteria in which there are 8 companies.

Green Innovation is one strategy that can be used to achieve corporate goals by considering environmental aspects and social responsibility. By bringing together the company's goals by taking environmental aspects into business strategy, the company will remain and continue in the future.

Table 5: Relation PROPER with green innovation score.

	Score 0 (No do GI)	score 1	Score 2	Score 3	score 4	Companies Total
PROPER 2	28	2	0	1	0	31
PROPER 3	85	37	28	26	17	193
PROPER 4	2	8	7	13	2	32
PROPER 5	2	1	7	4	8	22

Source: Processed data, 2017.

4.3.2 Effect of Green Innovation on Firm Value

Green innovation variable influences firm value, shows t test significance value equal to 0,019 (< 0.05). This is in accordance with the theory of stakeholders proposed by Freeman (2010) that the company's goal is not only to create value to stockholders, but to create value for all stakeholders. Creating value for all stakeholders require managers to improve their financial performance, social performance and environmental performance also ensuring that the company remains sustainable in the future. The company can continue to survive (sustainable) if the company is able to adapt its business processes to the rules or norms in the community (O'Donovan, 2002). This also corresponds to the theory of competitive advantage proposed by Porter (1985: 1) which states that competitive advantage aims to form a sustainable position in order to survive in industrial competition. Strategy is a very important tool to achieve competitive advantage.

Green innovation has a positive impact. For the environment, green innovation can reduce CO_2, increase biodiversity and reduce pollution. For the company, green innovation improves productivity, expands market share, creates an image that the company cares about the environment, improves

efficiency. Low production cost and high competitive advantage will lead the company to get high profitability.

The result of this study supports the result of research conducted by Salvadó, et al., (2015), Küçükoğlu and Pınar (2015) and Ar (2012). The innovation can create value for the company, both new companies and old companies. Innovation requires high initial investment and is a high-risk activity.

This study does not support research conducted by Özşahin et al., (2013) which concluded that green product innovation has no effect on firm performance. This is due to the company's low ability to innovate. The low ability to innovate will undermine the company's competitiveness.

4.4 Limitations of Research

Based on the research discussion, limitations of research are as follows:

▪ The study was limited to manufacturing firms only for a period of 3 years.
▪ Variables used in this study also consist only green innovation and firm value. The low level adjusted R square indicates that there are many other variables that can affect the relationship between these variables.

5 CONCLUSIONS

5.1 Conclusions

Based on the research discussion, the conclusions are as follows:

▪ The result of the company PROPER 2 (red) is linear that the lower the PROPER rank, the lower the green innovation level the company performs. Company PROPER 3 (blue) is the majority consisting of 193 companies. Companies incorporated in PROPER 4 (green) rankings proved to be quite concerned about the use of environmentally friendly products and production processes. Companies listed in PROPER 5 (gold) are already deeply concerned about green innovation.
▪ Green innovation has significant effect on firm value. This is in line with the stakeholder theory proposed by Freeman (2010) that the company's goal is not only to create the value of its stockholders, but to create value for all its stakeholders. Value creation for all stakeholders requires managers to improve their financial

performance, social performance, and environmental performance and ensure that the company remains sustainable in the future.

5.2 Suggestions

Based on the research that has been done, the researchers provide some suggestions for the next researchers as follows:

- The next researcher can use the data for more than 3 years in the hope that the results obtained will be more accurate and significant.
- Taking into account other independent variables that affect firm value, such as environmental management accounting.

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