

The Impact of Eco- Efficiency on Firm Value and Firm Size as The Moderating Variable

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Abstract. The purpose of this study is to analyze the impact of eco-efficiency implementation on firm value with firm size as a moderating variable. This research uses secondary data of annual report of manufacturing companies listed on the Indonesia Stock Exchange (BEI) period 2013-2017. Purposive sampling was applied in this research which resulted 469 sample according the criteria. The data analysis uses multiple linear regression analysis with SPSS. The result show that: 1) eco-efficiency as measure by ISO 14001 certification has a significant effect on the value of company. 2) firm size moderates the effect of eco-efficiency on the value of company.

Keywords: Eco-efficiency, Company size, Firm value.

Received: 09.10.2020

Accepted: 13.11.2020

Published: 24.12.2020

INTRODUCTION

The Central Statistics Agency (BPS) revealed that Indonesia's economic growth from 2013 to 2017 has increased from 4.79 in 2013 to 5.07 in 2017. This figure is the highest increase since 2017 with the processing industry sector / manufacturing as the biggest contributor (Setiawan, 2018). The economic growth is supported by business development. In a business activity, interactions exist between firm, community, stakeholders, and environment. Human are responsible for the sustainability of environment as it is an important aspect of life. Environmental issues currently become the concern in business practice. The increasing negative environmental issues shows that humans are careless. One example of current environmental issues is global warming. Current industrial growth is followed by an increase in pollution resulting from industrial processes that pollute the environment and trigger global warming (Agustia et al, 2018). Global warming itself is an increase of earth temperature because of increased output (emissions) of greenhouse gases. The effects of global warming include melting of ice at the north and south poles, rising sea levels, depletion of the ozone layer, the occurrence of irregular seasonal changes.

One of the phenomena in the industry that affects the quality of the environment, as quoted on detik.com (11/28/2018), is a polemic between PT. Rayon Utama Makmur with Sukoharjo residents who are still unfinished even though it has been going on for more than a year. Until now, PT. RUM has not been able to eliminate the foul odor caused by waste. At that time, there were three villages closest to PT. RUM affected namely Plan, Gupit and Celep Villages, Nguter District, Sukoharjo District. Later, the impact of PT RUM's waste spread to other districts.

The phenomenon becomes a piece of evidence that the company is less aware of the environment. Noorlailie (2019) argues that the environmental issue is becoming a serious problem today. The government must strengthen regulations regarding environmental issues. The industry phenomenon above has violated the rules regarding waste management in Article 1 paragraph (20) of Act No. 32 of 2009 concerning Environmental Protection and Management. A profit-oriented firm will try to use its resources as much as possible to obtain profits. The firm activities will have some impacts on the environment directly or indirectly. Besides, the use of natural resources by firms is also essential to consider. An environment that is always used continuously in the pursuit of economic growth will threaten economic growth in the future. As a result of continuously exploiting resources, it can increase current economic growth, but without realizing it can be a severe threat to future economic growth. To excessive use of resources, today may harm future firm's sustainability and cause some negative impact on the economic development of a country.

Nowadays, firms that interact with the environment begin to grow hopes in society to increase their social visibility. Companies in industries with high visibility among end consumers consider more to environmental and community involvement. The firm will disclose this information to be valued more on their effort for being environmentally responsible (Dianawati, 2016). Concern for the environment arises as a result of various encouragement from some parties, including the government, consumers, and stakeholders. This situation becomes a starting point where business people change their mindset from only caring about profits but also starting to care about the environment. The environment is one part of the triple bottom line concept that is not only profit-oriented but is also able to contribute to the people (People), and actively participate in protecting the environment (Planet), so the company must be balanced in economic, social and environmental activities. From the above explanation, the company must be responsible for protecting or limiting the exploitation of nature. Therefore, the company took the initiative to implement business processes that adjust to the concept of eco-efficiency (Anfimiadou, 2012). Companies that prioritize environmental performance in the production process must be able to manage resources efficiently, thoroughly, and wisely with every resource and energy used.

Application of the concept of eco-efficiency can be one of the strategies that can minimize waste and can reduce production costs so that it will improve efficiency, product quality, and good relations with the community, and improve environmental quality. The concept of eco-efficiency is a concept that implements efficiency and incorporates aspects of natural resources and energy or a production process that minimizes the use of raw materials, energy, water, and minimizes waste per unit of product (Ministry of Environment, 2003; Maluleke & Dlamini, 2019; Fuentes-Azpiroz et al., 2019). The application of eco-efficiency is highly recommended for developing countries, especially Indonesia. This concept is expected can reduce the use of resources and environmental impacts, therefore improve economic development.

Most firms in Indonesia have begun applying ISO 14001 certification. ISO 14001 certification indicates that a firm already implements the concept of eco-efficiency in their policies. ISO 14001 certification is given to companies that have an effort to improve the efficiency of their operational activities, which contain international standard regulations in the field of environmental management (World Business Council for Sustainable Development, 2006). With the existence of eco-efficiency, the results of waste management will be better and more efficient so that the pollution of water, air, and land around the company environment will be reduced. This action will have a positive impact on the firm because the community around will assume that the firm has tried to protect the environment well. With this assumption, the company has created a good image in the society as well as increasing firm value. The added value makes investors increasingly interested in investing in the company (Guenster et al. 2006).

The firm value does not always refer to numbers or nominal values. A firm is considered valuable if it can increase the prosperity of the owner or its shareholder increases. When management can establish good cooperation with other parties such as shareholders and stakeholders in making various decisions, this will facilitate the firm to increase the value of the company. Good cooperation will build a good relationship between managers and other parties. Besides, this relationship will minimize conflicts or problems that often arise between the two parties. A good company value will bring a positive impact on the company in the future, which will affect the investor's perspective because of the company's value.

Stakeholder theory deals with problems in the relationship between stakeholders and managers. Freeman et al. (2004) define stakeholders consisting of employees, shareholders, suppliers, and other communities, such as communities that are part of the social environment. This theory asserts that the idea of community cannot be separated from the activity of creating business value. Furthermore, Stakeholder Theory argues that there will be friction between the firm's external costs (rewards to bondholders) and internal costs (product quality costs, environmental maintenance costs). Based on this argument, there is a positive relationship between eco-efficiency and firm value. In addition to several studies on eco-efficiency and its impact on companies, most of the studies provide support for a positive relationship between eco-efficiency and corporate value (Al-Najjar & Anfimiadou 2012; Sinkin et al. 2008).

Walley & Whitehead (1994) argue that any attempt to improve environmental performance by using eco-efficiency will have an impact on the decline in the value of the company, which then has an impact on the decline in shareholder value. The general thought that the costs incurred by companies to comply with these ethical standards will result in higher product prices, making it difficult for companies to compete with other companies. Other groups argue that when carrying out these activities, the company will also need costs, which are called environmental costs. Environmental costs, in the short term, will reduce the profitability of the company. However, in the long run, this will increase the profitability of the company

because the environmental costs presented in the company's annual report will create the view that the company has respected the community's environment as a social creature (Dewi, 2014).

Firm value can be influenced by various factors, one of which is firm size. A large firm will get much pressure from the community. The demand to preserve the environment will be taken into consideration because it is directly related to the firm's image. Sembiring (2005) finds that firm size has a positive effect on the adoption of corporate eco-efficiency. The higher the size of a firm, the better the financial condition, and the more comfortable to obtain capital compared to smaller companies. The application of eco-efficiency will be more optimal because of the power to develop this program and will have an impact on the value of the firm to support the going concern process of the firm. In Indonesia, firms are still less aware of the importance of environmental care. In addition to protecting the environment, the application of the concept of eco-efficiency can add value to the firm and make production cost more efficient.

This research uses a sample of 466 manufacturing firms listed on the Indonesia Stock Exchange from 2013-2017. This study finds that there is a significant relationship between eco-efficiency (ISO 14001) with company value and company size, giving a moderating effect on firm value. The remainder of this paper is structured as follows. Section 2 develops the research hypotheses. Section 3 describes the sample and variables. Section 4 specifies the empirical result. Section 5 summarizes the paper and presents concluding remarks.

LITERATURE REVIEW

Stakeholder theory explains that more companies are trying to efficiently manage relationships with stakeholders by improving financial performance (Leal-Rodríguez et al., 2018). Likewise, a market orientation needs to be developed with a good understanding of competitors' strengths and weaknesses. Market orientation must develop and implement strategies to create customer value and better customer satisfaction (Kholis et al., 2016). Developing marketing competencies, capabilities, and capacity within the company is essential for achieving superior performance that has an impact on business performance and good investment opportunities (Lutfi et al., 2016; Fawzee et al., 2019).

Signaling Theory

The founder of the signal theory is Spence, who researched Job Market Signaling in 1973. Spence (1973) states that asymmetric information occurs in the labor market. Therefore, Spence created signal criteria in order to add strength to decision making. Information is an essential element for investors and business people because it presents information, notes, or a good picture of the past, current, and future conditions regarding the company's business prospects and how they are marketed.

Triple Bottom Line

People, Planet, and Profit or in Accounting Science, commonly called the Triple Bottom Line, is a thought that has been developing for quite a long time in Europe. The Triple Bottom Line Theory was put forward by John Elkington in 1997 through the book "Cannibals with Forks, the Triple Bottom Line of Twentieth Century Business." Elkington developed the concept of a triple bottom line with the terms of economic prosperity, environmental quality, and social justice. Elkington gave the view that if a company wants to maintain its survival, then the company must pay attention to "3P". In addition to the pursuit of profit (Profit), companies must also pay attention and be involved in the fulfillment of the welfare of the people (People) and contribute actively in protecting the environment (Planet). Elkington (1997) explains that the concept of the Triple Bottom Line is used as a principal found in the application of Corporate Social Responsibility programs in a company. These three interests are an outline and the main objective of a company's social responsibility.

Hypothesis Development

The Effect of Eco-efficiency on Company Value

Eco-efficiency in Indonesian comes from the word eco, which means the efficiency of economic resources and the optimal use of resources (DeSimone & Popoff, 1997). According to Environment Australia (1999), eco-efficiency is the right combination of economic and ecological efficiency. The firm can produce more goods and services with less use of energy and natural resources so that the company's production activities

will produce less waste and pollution (Amalia et al., 2017). The application of eco-efficiency shows that in producing goods for profit, companies also pay attention to the impact of their activities on the environment. Corporate social performance is one of the factors that influences company value. (Isnailita & I Made Narsa, 2017). Companies that fulfill their responsibilities to the environment have a unique attraction for investors because companies that have a sense of caring for the environment will get positive support from the community. This condition is consistent with stakeholder theory, which says that the better disclosure of environmental performance by the company. The satisfied stakeholders will provide more significant support for the firm for all its activities aimed at increasing the effectiveness and efficiency of performance and achieving profit. Osazuwa & Che-ahmad (2016) and Al-najjar & Anfimidou (2012) have researched the effect of eco-efficiency on firm value by showing a positive effect. Sinkin et al. (2008) also conducted a study with the same results. Based on the description above, the hypothesis is formulated as follows:

H1: Eco-efficiency has a positive effect on company value.

Effect of Eco-efficiency on Firm Value with Firm Size as Moderation Variable

Previous research by Ciriyani & Putra (2016) and Sari & Ulupui (2014) found a significant influence between firm size on eco-efficiency. Saha et al. (2013) also found that firm size had a significant effect on environmental performance. This study tests the use of eco-efficiency on firm value as an independent variable can be strengthened or weakened by the use of firm size as a moderating variable. Firm size is calculated from the natural logarithm of total assets owned by the company. If the company has high total assets, the management will be more flexible to improve its activities and performance. A large firm size illustrates that the firm has good prospects to survive in the future. The application of eco-efficiency that requires a high cost will be supported by how large the size of the company. The application of eco-efficiency by companies will minimize the generation of waste and pollution generated which will then have an impact on the value of the company which also increases through the high investor interest in companies with a deep concern for the environment that has a good image of the company in the eyes of the public. This condition will send a positive signal that will be received by investors in making decisions to invest their capital in companies that are considered to have good performance prospects in the future (Sujoko & Soebiantoro, 2007). Based on the description above, the hypothesis is formulated as follows:

H2: Firm size moderates the relationship between eco-efficiency and firm value.

RESEARCH METHODOLOGY

This study uses a quantitative research approach through hypotheses testing using specific data analysis. The quantitative testing is mostly doing generalization, describing phenomena structured, and proving hypotheses (Anshori & Iswati, 2009). This study divides the variables into 3 (three) types, namely the dependent variable, independent variable, moderation variable, and control variable. The population used in this study were all listed manufacturing companies and published annual reports on the Indonesia Stock Exchange during the 2013-2017 period totaling 466 companies. The reason for its use is because manufacturing companies impact their operational activities directly related to the environment. Besides, the manufacturing industry is the industry with the highest number of companies compared to other industries.

Variable Operational Definition

Dependent Variable

The dependent variable in this research is firm value. Firm value explains manager ability in managing the business. In this study, firm value is measured using Price Book Value (PBV) (Brigham & Houston, 2006).

$$PBV = \frac{\text{Stock Market Prices}}{\text{Book Value}}$$

Independent Variable

This study uses eco-efficiency as an independent variable. Eco-efficiency is known through measurements using ISO 14001 certification, which is one indicator of companies that have applied the concept of eco-efficiency in company policy. ISO 14001 is the first step identified for the company to improve the efficiency of the company's operations. ISO 14001 is a guideline that contains a set of procedures and

standards/regulations that companies must carry out to create an organization with effective and efficient environmental management. Every manufacturing company that has ISO 14001 certification is given a value of 1, while for manufacturing companies that do not have ISO 14001 certification is given a value of 0. Information about whether the company already has ISO 14001 certification or not usually can be known through the company's annual report.

Moderating Variable

Firm size is measured by the size of the assets and describes the firm's resources. The size of the firm also moderates the business and operational performance of the firm (Nasih et al., 2019; Wahyudhi, C.A et al., 2019; and Sukri, 2019). this study uses the natural logarithm of total assets as a reference for determining firm size. The formula used is:

$$\text{Firm Size} = \ln (\text{Total Asset})$$

Control Variable

Earnings per Share (EPS) is part of the profitability ratio measured by dividing net income by the number of shares outstanding. Earnings per share shows the firm's ability to earn profit for each share. High earning per share will attract investors to buy these shares. The impact is on the higher stock price and increasing profit. This is beneficial for the firm's shareholders because the higher the profit the company will provide for them.

Data analysis techniques used to answer the research objectives are divided into two, namely confirmatory factor analysis and regression analysis. In the analysis technique, there is a data quality test consisting of a validity and reliability test, a classic assumption test, consisting of a normality test, a heteroskedastic test and a multicollinearity test, and a hypothesis test and a coefficient of determination test.

$$\text{EPS} = \frac{\text{EAT} - \text{Preference Dividen}}{\text{Outstanding Shares}} \times 100\%$$

RESULTS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ISO	466	0	1	0,400	0,490
SIZE	466	22,758	33,989	28,273	1,616
EPS	466	-831,000	4030,661	137,302	429,243
PBV	466	-2,939	82,444	3,171	7,726
Valid N (listwise)	466				

Based on Descriptive Statistics, it can be seen that the value of the firm proxied on PBV, which is the dependent variable in this study, has an average value of 3.17112. In the table above it can also be seen that PBV has a minimum value of -2,939 owned by the Bentoel International Investama Tbk company in 2014 and a maximum value of 82.444 which occurred at Unilever Indonesia Tbk in 2017.

ISO 14001

		Frequency	Percent	Valid Percent	Cum. Percent
Valid	Total	466	100,0	100,0	
	Tidak Ada	281	60,3	60,3	60,3
	Ada	185	39,7	39,7	100,0

Based on the table above it can be seen that eco-efficiency which is an independent variable in this study, measured by obtaining ISO 14001 certification and testing descriptive statistics from a total of 466 existing data, about 39.7% of companies that have implemented eco-efficiency and the rest as much 60.3% of companies have not applied the concept of eco-efficiency.

Coefficient of Multiple Linear Regression and Moderation Regression

Variable	Model 1			Model 2 (Moderation)		
	Beta	t	Sig.	Beta	t	Sig.
Constant	2,134	4,642	0,000	12,360	1,407	0,160
ISO	1,544	2,141	0,033	-44,063	-3,345	0,001
EPS	0,003	3,759	0,000	0,003	3,169	0,002
SIZE				-0,366	-1,158	0,247
ISO*SIZE				1,590	3,443	0,001
R	0,206			0,265		
R Square (R ²)	0,043			0,070		
Adj. R	0,038			0,062		
F-Test	10,279			8,671		
Signifikance	0,000			0,000		

Based on the results of the multiple linear regression coefficients and moderation regression above show different signs of positive and negative coefficients. The coefficient that has a positive sign indicates a direct change between the independent variable to the dependent variable. The coefficient with a negative sign indicates an opposite change between the independent variable and the dependent variable.

Based on the Determination Coefficient Test that the coefficient of determination (R Square) of 0.043 or 4.3%. This result shows that the application of the eco-efficiency concept to firm value influences 4.3% in manufacturing companies listed on the Indonesia Stock Exchange in the 2013-2017 period. While the remaining 95.7% is influence or contribution rather than other variables outside the study. Based on the above table, it can be seen in model 2 that the coefficient of determination (R Square) is 0.07 or 7%. This result shows that the application of the concept of eco-efficiency to firm value has a different effect when the SIZE variable is added as a moderating variable that is 7% in manufacturing companies listed on the Stock Exchange in the 2013-2017 period. While the remaining 93% is an influence or contribution rather than Other variables outside the study, so it can be concluded that the presence of the SIZE variable gives a more significant effect on the effect of eco-efficiency with firm value.

Based on the test results of Multiple Linear Regression (Model 1), it can be seen that eco-efficiency has at-value of 2.141 and has a level of and has a significant level of 0.033 (<0.05) which indicates that the eco-efficiency variable has a significant influence on company value. This result is similar to the EPS variable, which obtains a statistical t value of 3.759 and shows a significant effect with a significance level of 0,000 (<0.05).

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CONCLUSION

This study aims to examine the effect of eco-efficiency on firm value with firm size as a moderating variable. Based on the results of the analysis, hypothesis testing and discussion in the previous chapter, the following are the conclusions of this study: (1) Eco-efficiency has a significant effect on firm value in manufacturing companies listed on the Stock Exchange in the 2013-2017 period; (2) Company size moderates the effect of eco-efficiency on firm value in manufacturing companies listed on the Indonesia Stock Exchange in the 2013-2017 period. The results in this study found that the aim of budget usage has a negative relationship to budgetary slack. Furthermore, we document participation in budget and budget emphasis can mediate the relationship between the aims of budget usage to budgetary slack. The results of this study can be a consideration for the regional government in determining the factors that can affect the budgetary slack and

can be an evaluation for the system of budget participation that has been implemented in the organization, especially in RWU.

ACKNOWLEDGEMENT

This paper is derived from Brian Kurnianta's Undergraduate thesis at the Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia. We are also grateful for the comments and insights from Eka Sari Ayuningtyas and Tubagus Algan Roiston.

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