

# Do Environmental Performance and Environmental Management Have a Direct Effect on Firm Value?

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## Abstract

This paper investigates the effect of environmental performance and environmental management on firm value using financial performance as mediation variable. There are still inconsistencies in research on environmental performance and environmental management and their impact on company value. This research used a quantitative approach involving secondary data. The variables used are environmental performance, environmental management, company financial performance, and company value. Multiple regression was used because it allowed the researchers to examine the relationship of each variable contained in the research framework by describing all of the direct effects (non-mediated effects) and the indirect effects of the research variables. The research sample consisted of 144 manufacturing companies listed on the Indonesia Stock Exchange from 2012 to 2017. Statistically, this study found that there was no direct effect that had a significant impact on environmental performance and firm value, and found that there is a significant direct effect of environmental management variables on firm value. Improved environmental management by the company is proven to increase the value of the company directly. This paper found that, not only does an increase in stakeholder trust happen when a company increases its environmental awareness, but there is also an increase in the financial aspects of the company.

**Keywords:** Environmental Management, Environmental Performance, Financial Performance, Firm Value

**JEL Classification Code:** A13, M41, Q51, Q56, Q58

## 1. Introduction

Environmental issues are of global concern nowadays. In many countries, special regulations are being issued regarding them, and the Indonesian government is no exception. Through RI Law No. 23 of 1997, the government of Indonesia established a Company Performance Rating Assessment Program in Environmental Management

(PROPER) that measures the environmental performance of a company in order to manage the environment of companies going public in Indonesia (Andayani, 2015; Haholongan, 2016) so the nation's economy could also increase (Jha, Matthews, & Muller, 2019). The company's impact on the surrounding environment must be regulated in order to control the company's impact on the environment as a form of preserving the environment (Andayani, 2015; Haholongan, 2016; Hens et al., 2018).

ISO 14001 has been used internationally to measure the quality of a company's environmental management system (Massoud, Fayad, Kamleh, & El-Fadel, 2010; Sri Tjahjono, 2013). ISO 14001 is a device that periodically seeks to manage and control the environmental impacts that prioritize pollution prevention. It has been used in more than 190 countries (Andayani, 2015; Bernardo, Casadesus, Karapetrovic, & Heras, 2018). Environmental management is an attempt by a company to contribute to the environment and it is a way to facilitate environmental awareness as a potential corporate strategy (Anna Y & John, 2018; Darnall, 2006). Environmental performance is a company's effort to create a conducive environment (Rakhiemah & Agustia,

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2012; Suratno, Darsono, & Mutmainah, 2004). However, the implementation of certification for environmental impacts is a challenge in itself. This is because there are possible conflicts of interest from the stakeholders (Beckmerhagen, Berg, Karapetrovic, & Willborn, 2003; Karapetrovic & Willborn, 2006; Wiengarten, Humphreys, Onofrei, & Fynes, 2017).

The environmental impact of the company's attention is the reason why a company applies environmental certification (Lee, Cin, & Lee, 2016), thus putting the company under heavy pressure (Soewarno, Tjahjadi, & Fithrianti, 2019). Strict rules for paying attention to the environment lead to the formation of competitive industries (Chen, 2005; Chen, Chang, & Wu, 2012; Jha, Matthews, & Muller, 2019; Porter & Van Der Linde, 1995). Manurung and Rachmat (2019), Massoud et al (2010) and Soewarno, Tjahjadi, & Fithrianti (2019) specifically states that manufacturing companies must pay more attention to the environment because they are the biggest contributor to environmental pollution.

In addition to being a form of corporate attention paid to the environment of a manufacturing company with good environmental performance, it would have better financial performance and, thus, be able to survive in a competitive industrial environment (Hariati & Rihatiningtyas, 2015; Maryanti & Fithri, 2017). Companies with good environmental performance tend to get good assumptions from the public, so their company performance also increases (Nurhudha & Suwanti, 2013; Qiu, Shaukat & Tharyan, 2016; Suratno, Darsono, & Mutmainah, 2004). Titisari and Alviana (2012) and Widhiastuti, Suputra and Budiasih (2017) assume that in developing countries, a good response from the community towards the company's environmental performance can improve the company's economic performance. Not only are there improvements to the environmental performance, the companies can also improve their financial performance by implementing good environmental management (Figge & Hahn, 2004; Hilmi, 2016; Sri Tjahjono, 2013).

Environmental management that is implemented seriously by the company can improve efficiency, so the company's financial performance therefore increases. Improved environmental management allows companies to use their natural and human resources more efficiently (Acemoglu, Aghion, Bursztyn, & Hemous, 2012; Anna Y & John, 2018). The results of Sambasivan and Fei's (2008) study shows that financial benefits can increase the company image, increase the customer trust and increase the relationships between employees. However, the implementation of environmental performance and environmental management is inseparable from the issues of cost and efficiency (Alexopoulos, Kounetas & Tzelepis, 2018; Curkovic & Sroufe, 2011), so there is a possibility of a decline in company performance.

The key to success in order to improve the company's environmental performance and effective environmental management is the open management of the importance of environmental maintenance, changes in organizational perspective and any technical and non-technical aspects (Manurung & Rachmat, 2019; Zheng & Kahn, 2017). Amores-Salvadó, Martin-de Castro and Navas-López's (2015) research shows that environmental performance and environmental management contribute to improving company performance. These results prove that by focusing on environmental issues, the management have managed to make the process more efficient and that they have solved problems that might arise in the future (Amores-Salvadó et al., 2015; Darnall, 2006). Amores-Salvadó et al. (2015), Bahri and Cahyani (2017), Hariati and Rihatiningtyas (2015), Lee et al. (2016) Maryanti and Fithri (2017) and Velte (2017) have proven that by paying more attention to environmental issues, companies improve their financial performance and indirectly, companies that have good financial performance have high corporate value.

Environmental research by Hariati and Rihatiningtyas (2015), Bidhari, Salim, Aisjah, & Java (2013), Qiu et al (2016) and Renneboog, Ter Horst and Zhang (2008) has found that environmental performance can increase company value, especially within manufacturing companies. Amato and Amato (2012), Lyon and Shimshack (2015) have also found a direct influence where corporate environmental management can increase company value. However, Jacobs, Singhal and Subramanian (2010), Suminar (2018) and Watson, Meric and Meric's (2012) research shows that when companies pay attention to environmental problems, the value of the companies tends to decrease.

This research was conducted because there are still inconsistencies in the research on environmental performance and the environmental management of company value. Researchers have developed a model using the work of Andayani (2015) and Soewarno et al. (2019) involving financial performance as a variable mediating the effect of environmental performance and environmental management as it relates to firm value.

## 2. Literature Review and Hypothesis Development

Indonesia is the same as any other developing country that is currently solving environmental problems (Soewarno et al., 2019). This has led to the formation of a very competitive business environment (Chen, 2005; Chen, Chang, & Wu, 2012; Faisal, Situmorang, Achmad, & Prastiwi, 2020). Manufacturing companies are in a dilemma where there is a choice to pay more attention to environmental issues or to improve company performance so then the company's value

in the eyes of the stakeholder's increases. The empirical results prove that companies that pay more attention to environmental issues also have good financial performance (Bahri & Cahyani, 2017; Maryanti & Fithri, 2017; Velte, 2017). The company's improved financial performance is driven by the public recognition or trust in environmental issues (Andayani, 2015; Qiu, Shaukat, & Tharyan, 2016).

Environmental issues cannot only be considered through improving the company's environmental performance. They also need to be considered through environmental management (De Oliveira, Oliveira, Ometto, Ferraudo, & Salgado, 2016). Theoretically, the implementation of environmental management can increase the company's competitive advantage because it operates more efficiently. This is so then costs are reduced and productivity increased. This means that customer satisfaction goes up (Bernardo et al, 2012; Santos, Costa & Leal, 2012). Heras-Saizarbitoria, Molina-Azorín and Dick (2011), Rodriguez-Melo and Mansouri (2012) said that the main advantage of implementing environmental management is the reduced use of natural resources and improving the company's image in the eyes of its stakeholders.

Previous research has proven that environmental performance and environmental management can improve a company's financial performance, then, companies with good financial performance tend to have high corporate value (Machmuddah, Sari, & Utomo, 2020; Sudiyatno, Puspitasari, Suwarti, & Asyif, 2020). Vishnani and Shah (2008) have proven that the ratio of financial statements can affect capital market valuations. This proves that financial performance as measured using financial ratios has a significant effect on firm value (Gamayuni, 2015; Prasetyorini, 2016; Sharma & Singh, 2012; Sudiyatno, Puspitasari, Suwarti, & Asyif, 2020). An increase in company value can be triggered by market movements that favor companies with high financial performance (Sharif, Purohit, & Pillai, 2015). Investors tend to look at the company's financial ratios first (Amogha & Suresh, 2019). Isidro and Sobral (2015); Kim and Starks (2016) found that companies that have a female board of directors have a higher financial performance, so the company's value therefore also increases. This is because women are more concerned with environmental issues, so the company's financial performance and company value increases. Isidro and Sobral (2015); Machmuddah, Sari, & Utomo, (2020) stated that environmental obligations indirectly affect financial performance and increase company value (Ratri & Dewi, 2017). Based on the previous research findings, the hypotheses in this study are:

**H1:** *Financial performance mediates the company's environmental performance against firm value*

**H2:** *Financial performance mediates the management of a company's environment against firm value*

### 3. Research Methodology

This research used a quantitative approach involving secondary data. Quantitative research aims to generalize the data in a structured manner so then the influence of the variables can be known (Anshori & Iswati, 2009). The research variables used are environmental performance, environmental management, company financial performance and company value. The research sample consisted of 144 manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2012-2017 period. Manufacturing companies were chosen because of their operational activities that involve a high environmental impact due to the use of raw materials from nature and the manufacturing processes causing pollution. Manufacturing companies, thus, have a close relationship with environmental issues (Anshari, 2019; Soewarno et al., 2019). Environmental performance is the company's effort to create a good and healthy environment (green) (Andayani, 2015). As for data analysis method, this study used the multiple regression method to examine the direct effect of the independent variable on the dependent variable directly. This is so then the indirect effect of the independent variable on the dependent variable using an intermediate variable (intervening) can be known more deeply as illustrated by the following research framework:

Baron and Kenny (1986) explained that each variable must be explained in relation to others so then the influence of each variable can be explained comprehensively. Multiple regression was used because it allowed the researchers to examine the relationship of each variable contained in the research framework by describing all of the direct effects (non-mediated effects) and the indirect effects (mediated effects) of the research variables (Engel, Bryan, Noonan, & Whitehurst, 2018).

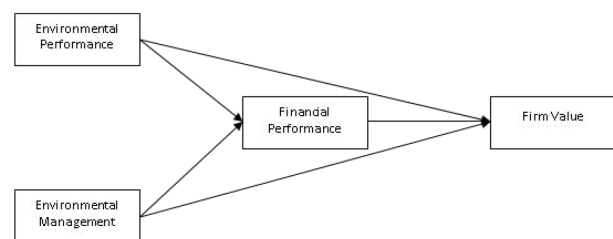


Figure 1: Research Model

### 3.1. Environmental Performance

Environmental performance is an independent variable measured by the results of the PROPER ranking constructed by the Ministry of Environment. This measurement is in accordance with Rakhiemah and Agustia (2012). The ranking of environmental performance using PROPER consists of five colors, as described in Table 1.

Proper certificates are a measure of company environmental performance because they are a part of government programs used to encourage public companies to improve their environmental management (Andayani, 2015; Haholongan, 2016).

### 3.2. Environmental Management

Environmental management is measured using a dummy variable with the number 1 for those who already use ISO and 0 for companies that use ISO 14001. ISO 14001 can be interpreted as an environmental management system implemented by companies to manage environmental problems. Improved environmental management for companies provides economic benefits such as increasing productivity, cost savings and providing competitive advantages (Adams, 1999; Bansal & Hunter, 2003; Kokangül, Polat, & Dağsuyu, 2018). ISO 14001 becomes a measure of corporate environmental management because it aims to make companies voluntarily sustainable in order to achieve improved management and control of its environmental impacts (Massoud et al., 2010; Sri Tjahjono, 2013).

### 3.3. Firm Performance

The company’s financial performance is measured using Return-on-Assets (ROA). Financial performance is the result of the achievements achieved by each company in the running of its business within a certain period of time in the financial unit. The company’s performance is measured based on financial performance. ROA is expressed as a percentage. The formulas used to calculate ROA are:

$$ROA_{i,t} = \frac{\text{Net Income}_{i,t}}{\text{Total Asset}_{i,t}} \tag{1}$$

$ROA_{i,t}$  = Company’s Return-on-Assets on year t  
 $\text{Net Income}_{i,t}$  = Company’s Net Income on year t  
 $\text{Total Asset}_{i,t}$  = Company’s Total asset on year t  
 ROA was chosen as a measure of the company’s financial performance because the purpose of calculating the company’s ROA is to help the management and/or investors to see how well the company is able to manage its assets so then it gets the maximum profit.

### 3.4. Firm Value

Company value is the level of success of a company related to managing its resources based on the assessment of its investors. Company value is measured based on market performance via Tobin’s q (Chung & Pruitt, 2007).

$$\text{Tobin's } Q_{i,t} = \frac{MVCS_{i,t} + STL_{i,t} - STA_{i,t} + BVLTD_{i,t}}{BVTA_{i,t}} \tag{2}$$

$\text{Tobin's } Q_{i,t}$  = Company’s firm’s value on year t  
 $MVCS_{i,t}$  = Company’s Market Value of Commons Stock on year t  
 $STL_{i,t}$  = Company’s Short - term liabilities on year t  
 $STA_{i,t}$  = Company’s Short - term asset on year t  
 $BVLTD_{i,t}$  = Company’s Book value of long - term debt on year t  
 $BVTA_{i,t}$  = Company’s Book value of total asset on year t  
 When Tobin’s Q value ratio is more than 1, it indicating that the profit generated by the company’s assets exceeds the value of the investment spent to obtain the assets. This indicates that the company’s performance is getting better. Tobin’s Q is the market ratio of the companies that shows how the management perform when managing their assets (Bharadwaj, 2000), Tobin’s Q also responds to an increase in the company’s market value due to intangible assets (Fang, Palmatier & Steenkamp, 2008).

## 4. Results

Testing the model in Table 2 shows that the R Square figure of 0.178 or 17.8% is the contribution of the Environmental Performance variable measured by the proper certificate and Environmental Management measured by ISO14001. Company performance is measured by ROA at 17.8%. The remaining 82.2% is influenced by other variables outside of the research model. Table 3 shows an R Square figure of 0.425 for the ISO and that the PRP influence model on Company Value (NPR) is mediated by ROA. The model shows the contribution of ISO, PRP and ROA on NPR is 42.5% while

**Table 1:** Example of a Table Caption

No	Color	Explanation	Score
1	Gold	Very Very Good	5
2	Green	Very Good	4
3	Blue	Good	3
4.	Red	Poor	2
5	Black	Very Poor	1

Explanation:  $PRP_{i,t}$  = Company’s PRP on year t



57.5% is influenced by other variables outside of the research model. Further significance testing was continued by looking at the statistical parameters of t, taking into account the acquisition of significance in the PRP and ISO pathways.

Table 4 shows that the value of sig < 0.05 is for environmental performance (PRP) and environmental management (ISO) as related to financial performance (LnROA). Figure < 0.05 proves that the effect of environmental performance and environmental management on corporate financial performance (ROA) is significant. Empirically, Table 4 and Figure 2 show that the regression coefficient value of environmental performance on financial performance is 0.380 or 38.0%, thus environmental performance has a positive and significant effect on corporate financial performance but no significant direct effect on environmental performance is found related to the value of the company.

The results of the path analysis in Table 5 and Figure 2 show that financial performance has a positive and significant effect on firm value, thus empirically increasing the company's financial performance will increase firm value. The results of the path analysis of Table 5 and Figure 2 show that environmental performance cannot directly influence the value of the company but it can indirectly affect the value of the company through financial performance. The value of the indirect effect of environmental performance is higher (0.196) than the direct effect (0.076), thus proving that financial performance mediates the impact of environmental performance on firm value, so Hypothesis 1 (H1) is accepted.

The H1 testing results indicate that the indirect effect of environmental performance on company value is

strengthened by the results of the Sobel test. Based on the Sobel test results in Table 6, the p-value of environmental performance as related to firm value is less than 0.05 (p-value < 0.05), thus proving that financial performance mediates the effect of environmental performance on firm value. H1 is, thus, accepted.

Empirically, Table 2 shows that the environmental management regression coefficient (ISO) on financial performance (LnNPR) is 0.234 or 23.4%, thus showing that environmental management has a positive and significant effect on corporate financial performance. Table 2 also shows the environmental management regression coefficient (ISO) on firm value (LnNPR) of 0.116 or 11.6%. There is a direct influence of company management on firm value. The path analysis results in Table 5 and Figure 2 show that environmental management has both a direct and indirect effect on firm value. The value of the indirect influence of corporate environmental management, which is higher than the direct effect on firm value (0.121 > 0.116), proves that financial performance mediates environmental management's impact on firm value. Hypothesis 2 (H2) is accepted.

Table 7 reinforces the results of the path analysis shown in Table 5 and Figure 2, in that financial performance mediates environmental management concerning firm value. Based on the results of the Sobel test in Table 7, the p value of environmental management related to the value of the company is smaller than 0.05 (p-value < 0.05). This value proves that environmental performance mediates the effect of environmental management on company value, so H2 is accepted.

**Table 2:** Model on PRP, ISO and ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.422 <sup>a</sup>	.178	.154	.92789

a. Predictors: (Constant), LnTAS, LnTPC, LnUPR, LnJKR, LnPJJ

b. Dependent Variable: LnROAV

**Table 3:** Model on PRP, ISO, ROA and LnNPR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.625 <sup>a</sup>	.425	.406	.8938109

a. Predictors: (Constant), LnTAS, LnTPC, LnROA, ISO, LnUPR, PRP, LnJKR, LnPJJ

b. Dependent Variable: LnNPR

**Table 4:** Hypothesis test of PRP, ISO and ROA and the Hypothesis test on PRP, ISO, ROA and NPR

Variable	Beta	Sig.	Variable	Beta	Sig
PRP	.380	.000	PRP	.076	.199
ISO	.234	.000	ISO	.116	.032
			LnROA	.515	.000

a. Dependent Variable LnROA

b. Dependent Variable: LnNPR

**Table 5:** Indirect Effect and Total Effect

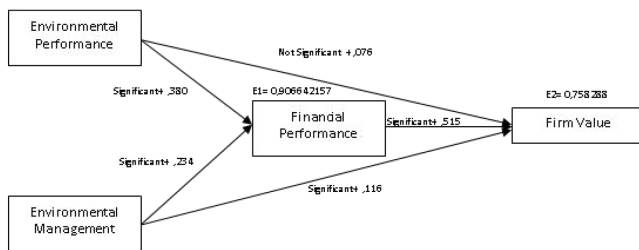
Variable	Direct Effect	Indirect Effect, ROA as Mediating Variable	Conclusion	Variable
PRP to NRP	0.076	0.380 x 0.515 = 0.196	0.196 > 0.076	Mediated
ISO to NRP	0.116	0.234 x 0.515 = 0.121	0.121 > 0.116	Mediated

**Table 6:** Sobel Test Environmental Performance on Firm Value

Input			Std. Error:	p-value:
a	0,224	Sobel Test	0,026828	0,000777
b	0,592	Aroian test	0,026934	0,000857
S <sub>a</sub>	0,039	Goodman test	0,026701	0,000707
S <sub>b</sub>	0,061			

**Table 7:** Sobel Test Environmental Management on Firm Value

Input:			Std. Error:	p-value:
a	0,721	Sobel Test	0,121324	0,000435
b	0,592	Aroian test	0,121883	0,000462
S <sub>a</sub>	0,191	Goodman test	0,120764	0,000409
S <sub>b</sub>	0,061			



**Figure 2:** Path Analysis

### 5. Discussion

This study focuses on the influence of environmental performance and environmental management on firm value, mediated by financial performance. From the statistical results, it can be concluded that financial performance mediates the effect of the environmental management and environmental performance variables on firm value. However, there are differences in the direct effect of the independent variables on the dependent variable. Environmental performance does not have a significant direct effect on firm value in line with the research by Shapiro, Hobdari and Oh (2018) which says that good environmental performance still cannot convince the markets that companies manage their natural resources well. Hahn, Figge, Pinkse, and Preuss (2010) doubt that environmental performance is another factor that can increase the economic value of a company. Although Hahn et al. (2010) doubt this, Jacobs, Singhal and Subramanian (2008)

found the same results as this study, in that environmental performance has a positive effect on the stock returns in manufacturing companies, although it has no significant effect. Research on Malaysian, Thai, and Singapore and Hong Kong companies found that many companies have begun to shift their attention to social performance more compared to environmental performance. This is because it has a more significant impact on good corporate governance, so the value of the company in the eyes of the stakeholders is higher (Mitra & Gaur, 2020).

Statistically, this study found that there was no direct effect that had a significant impact on environmental performance and firm value. The indirect effect of environmental performance on firm value through firm performance has a significant value. Based on these results, it can be concluded that the value of the company can only rise significantly when the company’s financial performance increases. Stanwick and Stanwick (2013) stated that a company must focus on its social and environmental performance so then the other variables in the company can increase. The level of efficiency and effectiveness of a company is reflected in its environmental performance. This can strengthen a company’s reputation, reflecting a strong company and increasing company profitability (Song, Zhao & Zeng, 2017). Thus when a company improves its environmental performance, the company’s financial performance increases and so the value of the company increases.

This study found there to be a significant direct effect of environmental management variables on firm value. Improved environmental management by the company is proven to increase the value of the company directly. This

is because improved environmental management proves that the company has made innovations that reduce production costs and creates new competitive value (Anna Y & John, 2018; Baumgartner, 2014). An increase in company value can also be caused by an increase in the level of stakeholder confidence in companies that care more about voluntary environmental management (Teng & Wu, 2018). Besides having a direct effect on increasing the value of the company by increasing the attention paid to the company's management, the company can obtain an increase in financial performance. This is caused by one of the impacts of improved management being that it can reduce the company's operational costs (Che-Ahmad & Osazuwa, 2016; Molina-Azorín et al, 2009). With good environmental management, companies can work more efficiently (Al-Najjar & Anfimiadou, 2012). Corbett, Montes-Sancho and Kirsch (2005) found that companies implementing ISO 9000 gained substantial financial performance improvements caused by an increase in the potential intangible assets of the company.

## 6. Conclusion

Environmental issues are of global concern today, so many countries are implementing environmental standards or certifications that companies must meet. Based on the results of the research and discussion, this study concludes that environmental performance has an indirect effect on firm value through the company's financial performance. When the company focuses on improving its environmental performance, the company's financial performance will also be remembered. When the company's financial performance increases, an increase in environmental performance will indirectly increase the value of the company. In contrast to environmental performance, which has an indirect effect on environmental values, environmental management has a significant direct effect on corporate value. Companies that improve their environmental management can increase the value of their companies directly and indirectly. Companies that improve their environmental performance and environmental management have been proven to make their companies more efficient, to have better a competitive value, and to create a good corporate image, so company value therefore increases. The sample of this study was 144 manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2012-2017 period.

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