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The Effect of Eco-efficiency on Firm Value with Financial Performance as a Moderating Variable

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Abstract
Eco-efficiency is one of the ways companies can help realize the world agenda, namely the Sustainability Development Goals. This study aims to examine the impact of implementing eco-efficiency on firm value moderated by financial performance as measured by ROA and ROE. The sample taken consisted of panel data from 140 energy companies from 2017-2021. The data obtained was then analyzed using panel data regression. This study proves that eco-efficiency has a positive effect on firm value. Companies that implement eco-efficiency have a higher company value than companies that have not implemented the concept of eco-efficiency. financial performance ROA (return on assets) has a negative effect on firm value which indicates the performance of company management in using company assets is not managed effectively and efficiently. While the financial performance of ROE (return on equity) has no effect on firm value because there are companies that use profits for retained earnings and are not distributed to shareholders. Meanwhile, the results of testing financial performance variables using ROA (return on assets) and ROE (return on equity) proxies as moderators in this study cannot strengthen or weaken the relationship between eco-efficiency and firm value.

Keywords: Eco-efficiency, Financial Peformance, Firm Value

Introduction

Eco-efficiency is part of the company's control process to minimize environmental damage and increase company productivity by reducing costs and creating value (Huppes & Ishikawa, 2005; Yatminiwati et al., 2022). Companies should not only pursue maximum profit, but also pay attention to the social responsibility of the local community to maintain the survival of the company itself. This is because companies that only seek profit often experience conflicts of interest internally or externally (Manurung, 2017). Society wants companies to be more friendly to the environment. The use of renewable and non-renewable resources requires responsibility. In short, we need to wisely safeguard the supply of resources that present and future generations can enjoy. Companies achieve prosperity because they can use the resources they have (Panggau & Septiani, 2017; Sulistyan et al., 2022).

Reducing environmental burdens and restoring ecosystems requires large amounts of management resources, but these efforts are the result of restoration processes that bring about environmental efficiencies and should be considered (Osazuwa & Che-ahmad, 2016). The concept that

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can be developed to address corporate environmental problems is the concept of eco-efficiency. The concept is efficiency involving natural resources and energy or raw materials, the use of water and energy as well as aspects of the production process that minimize the environmental impact of each product (Ministry of Environment of the Republic of Indonesia, 2003). The international discussion organized by the Economic Council for Sustainable Development promotes eco-efficiency. This is the company's main strategy to improve the environmental performance of its services and products (Ranald, 2002).

Companies that apply the concept of eco-efficiency will reduce the impact of environmental damage caused by production waste and will provide benefits to stakeholders so that when stock prices increase, company value increases. By increasing the value of the company and shareholder wealth, the company's goals will be achieved (Aviyanti & Isbanah, 2019; Rusdianti et al., 2022). Today's companies are required to set a good example of being a company that is environmentally friendly and carry out sustainable transformations for the future of the company in the future. Society's demands on business people arise with the emergence of phenomena caused by industrialization activities.

PT Bukit Asam Tbk (PTBA) transformed into an environmentally friendly energy and chemical company. The company announced its willingness to finance up to Rp. 60 trillion. In November 2021, Bukit Asam made a profit of Rp. 7 trillion, the highest profit during the company's existence. In obtaining these benefits, Bukit Asam's Ebitda was able to exceed a higher figure than RP. 10 trillion. With such financial strength, the company does not have to worry about financing future change plans. This change was made to support the target of net zero emissions (NZE) 2060 which will increase the contribution of companies to support national energy security (Investor.id, 2021). This phenomenon shows that companies that will make changes in the future to become environmentally friendly companies must provide benefits to potential investors, the community and others related to the company's environment. The above statement, as it is known, that the company earned a profit of Rp. 7 trillion and the ebitda of PT. Bukit Asam can penetrate more than 10 trillion rupiah. This figure is the highest figure as long as the company has been established so it can be interpreted that PT. Bukit Asam is in very good financial performance and can attract potential investors to invest and share prices have increased in the capital market, which has resulted in an increase in company value (Investor.id, 2021). Companies must make changes to become companies that care about the surrounding environment so that it will increase company value and the company's contribution to increasing national energy security.

One of the company's goals is to increase the value of the company and the welfare of shareholders. The increase in the share price makes investors believe in the company's financial results and the company's prospects for sustainable development in the future. When deciding which company shares to invest in, investors use company value as a benchmark (Aviyanti & Isbanah, 2019). (Yahya & Fietroh, 2019) also said that company value can provide maximum success to shareholders in accordance with an increase in share prices. the higher the share price, the greater the wealth of its shareholders. The share price reflects the value of the company. An important aspect that investors consider when investing is financial performance. If the company's performance has high financial performance, it can increase the demand for shares, so that the stock price increases. Every investor should thoroughly analyze the company before making a decision to buy, hold or sell shares. This analysis is the information contained in the financial and annual reports which is important information to involve the price of shares in the capital market and the performance of the company (Rutin et al., 2019). Eco-efficiency is an interesting variable to study because previous researchers have discussed the impact of eco-efficiency on financial performance a lot. As stated (Osazuwa & Che-ahmad, 2016) implementing eco-efficiency requires a large burden, because technological investment requires technological engineers and ecological products that reduce significant environmental impacts and meet eco-efficiency requirements. When implementing eco-efficiency, the use of heavy loads affects company profits and is bad news for investors, because it can reduce company value. Eco-efficiency is a clean product, so to maintain the public interest in a clean environment, companies must invest to reduce pollution which can be detrimental to their financial performance (Jaggi and Freedman, 2006).

The purpose of this research is to test how the company's internal performance and determine the direct effect of eco-efficiency as an environmentally friendly company-based sustainability concept that can minimize the impact of environmental damage so that company value increases and provide empirical evidence of the company's efforts to overcome environmental problems by adopting sustainable business practices such as management practices. environmental and international standards to increase corporate value, and provide evidence of how investors can consider environmental aspects when making decisions, strengthen environmental regulations, especially with the expectation of corporate social responsibility. that regulations and programs related to business and the environment will continue to be developed. According to (Aviyanti & Isbanah, 2019) Eco-efficiency is an environmental sustainability concept implemented by companies with the aim of reducing the environmental impact resulting from the company's core activities while minimizing the company's operational costs. Eco-efficiency can minimize negative environmental impacts and resource consumption, this can improve the company's image in society (Rodoni et al., 2017).

This research is important to do because now Indonesia holds the presidency of the G20. The G20 is an international organization focused on coordinating global economic policies. Therefore, Indonesia carries the spirit of recovery, bearing in mind that the world is still under pressure due to the Covid-19 pandemic, which requires joint and inclusive efforts to find solutions or solutions for the world to recover. To achieve this goal, the presidency will focus on Indonesia's priority areas which are seen as the key to a strong and sustainable recovery. from the priority sectors included in this study, namely by carrying out energy transitions and sustainable finance (Bi.go.id, 2022). To ensure a sustainable and green future and to face climate change in real terms and promote the energy transition to new and renewable energy, prioritizing energy supply security and addressing climate risks and risks associated with transitioning to low carbon (Kemenkeu.go.id, 2022).

Several previous studies on the impact of eco-efficiency on firm value have been carried out. Research by Panggau & Septiani, (2017), Osazuwa & Che-ahmad, (2016), Aviyanti & Isbanah, (2019), obtained results that eco-efficiency has a positive impact on company value. In contrast to Septianingrum's research, (2022), obtaining eco-efficiency results has a negative impact on company value. The negative effect of the environmental system reduces the value of shares where the company's goals conflict with those of stakeholders (Panggau & Septiani, 2017). This is because environmental costs can reduce profitability and return on investment (Osazuwa & Che-ahmad, 2016). The existence of the research gap that has been described, is the background for researchers to propose research by testing and to find out whether there are different results regarding eco-efficiency on firm value with financial performance capabilities using ROA (return on assets) and ROE (return on equity) proxies as a moderator that can weaken or strengthen the relationship between eco-efficiency and firm value. This study examines the impact of eco-efficiency on firm value with financial performance as a moderator. This study develops research by Osazuwa & Che-ahmad, (2016) examining profitability moderating effects and exploiting the relationship between eco-efficiency and public value of Malaysian companies. The development of this research adds that financial performance is proxied using ROA (return on assets) and ROE (return on equity) as moderators, while firm value is the dependent variable. And adding renewal by testing the role of financial performance variables as a proxy using ROA (return on assets) and ROE (return on equity) in moderating the relationship between eco-efficiency variables on firm value. The research period is 2017-2021. The object of this research is energy companies listed on the Indonesia Stock Exchange (IDX).

Stakeholder Theory

Freeman (2015) Stakeholders are groups or individuals who influence the goals of a company. This theory states that companies are not only responsible for obtaining profits for owners and investors, but are also responsible for providing benefits to the environment, shareholders, society and management, and are committed to promoting sustainability in the business world. This research can be related to the concept of eco-efficiency carried out by the company. Because if the company applies the concept of eco-efficiency, it will minimize the impact of environmental damage so that it will improve the company's image and company value. To achieve this target the company is required to protect the environment and its stakeholders in running its business. The purpose of stakeholder theory is to help company management understand the negative effects arising from the company's production process so that companies can minimize it and not interfere with the activities of interest groups (Aviyanti and Isbanah, 2019).

Signaling Theory

Signaling theory has three important elements, the first is the signaler, the second is the signal itself, the third is the signal receiver (Connelly et al., 2011). Company management gives signals about the company or organization, then turns them into signals (information) that are given to investors, the public, the government. The importance of corporate information signals for investors makes signaling theory necessary in decision making. Signaling theory relates to how companies present financial information and annual reports to outsiders. Information is an important element for an investor. Company information includes past, present and future conditions, company records or descriptions.

Effect of Eco-Efficiency on company value

Stakeholder theory emphasizes companies to apply the concept of eco-efficiency. Currently, investors are starting to consider investing in companies that care about the environment and the public to measure company value. Eco-efficiency acts as a management guide that reduces the company's environmental impact and at the same time creates more value for investors (Dewi and Rahmianingsih, 2020). Supported by the research of Panggau & Septiani, (2017) the results show that companies that implement eco-efficiency as an environmental strategy increase company value. However, according to Osazuwa and Che-ahmad, (2016) Based on stakeholder theory, when a company incurs high costs, there is friction between the company's external costs (payments to bondholders or investors) and internal costs (product quality costs, environmental costs). If so, it is feared that these costs will reduce the returns of stakeholders, especially investors. This is supported by research by Paulraj & de Jong, (2011) who found that environmental management systems have a negative impact on company capital, because environmental management system practices do not affect the growth of company value (Hazudin et al., 2015). However, experts debate the impact of eco-efficiency on company value. Firm value can increase if company management adopts the concept of eco-efficiency in measuring company value. The higher the company value, the greater the shareholder wealth. Research conducted by Osazuwa & Che-ahmad, (2016), Panggau & Septiani, (2017) found that eco-efficiency has a positive impact on company value. Based on the description above, the following hypotheses can be made:

H1: Eco-efficiency has a positive effect on firm value

Effect of financial performance on firm value

Signaling theory tells how companies present signals to the public, which are implemented through financial information and company annual reports, in the form of credible company financial and non-financial information, in order to provide certainty about the company's future prospects. Information is very important for investors, so signaling theory is needed to make decisions. Signaling theory encourages companies to provide information to generate profits. When investors understand what is presented as a good signal (good news), stock prices will increase (Harr et al., 1992). The availability of disclosure or additional information about a company is a consideration for investors in investing in a company's shares (Panggau and Septiani, 2017). An increase in the stock price of a company indicates that the company has high corporate value. According to Nguyen, (2018), company value provides wealth to shareholders along with rising share prices in the capital market. The company's financial statements are considered important because they are the basis for decision making. According to Mudjijah et al., (2019), companies with good financial performance have high trust in dealing with their stakeholders. the company can show that the company meets the expectations of investors and creditors. The profitability ratio is a ratio measuring a company's performance to gain large profits from its normal business activities (Hery, 2017). This study uses proximate profitability ratios ROA (return on assets) and ROE (return on equity). Research conducted by Lukiman & Hapsari, (2018) Return on assets (ROA) has a positive impact on company value. Business operations must be profitable or in a position to generate a profit. Companies with good and high returns are in high demand by investors. Therefore, the value of the company goes up. ROE (return on equity) is a financial performance ratio to measure a company's performance ability in managing available capital to generate net income. This ratio is useful for knowing the results obtained from investment. The higher the value of ROE owned by the company, the investors are interested in investing in the company so that it will increase the stock price. The better the company's performance in generating income from invested capital, the higher the company value and makes it easier for investors to analyze company value, because the results of this analysis can provide signals in the form of useful information for investors (Prasetyo et al., 2020). Riny's research, (2018) shows return on equity has a positive impact on company value. Supported by research by Dahar et al., (2019) also obtained results that ROE had a positive impact on company value. Based on the explanation above, the hypothesis is:

H2a: ROA has a positive effect on firm value
H2b: ROE has a positive effect on firm value

The influence of financial performance in strengthening the effect of eco-efficiency on firm value

Based on the theories above, it can be seen that companies that convey good financial and annual report signals or information, companies will easily get high profits and good financial reports will be easy to read by investors and the public, especially for people who are conducting research. So that many investors invest by buying company shares will increase share prices and increase company value. so that the company will certainly increase its concern for the environment. Companies that have gone public must have implemented environmentally friendly corporate management and upheld the prevailing societal norms by implementing a sustainable eco-efficiency concept. In caring for the social environment, companies must be able to adapt to existing social values (Panggau & Septiani, 2017). In this study, the financial ratios taken to measure financial performance are ROA (Return on Assets) and Return on Equity (ROE). According to Sartono (2015), return on assets measures a company's ability to generate profits using its assets. If the value of ROA (return on assets) increases, the company's profits will increase. This can cause the value of the company to increase. Therefore, an increase in the value of ROA (return on assets) indicates that the company is using its assets more efficiently, and investors can expect profits from the company. Return on equity (ROE) according to Yahya & Fietroh, (2019) is a measure of the level of change in a company's efficiency in obtaining net profit by using personal capital to obtain these profits for use by owners or investors. However, companies must not only generate high profits, but must pay attention to social responsibility of the community and must create good environmental management in order to increase concern for the environment so that it will increase the value of the company. Concern for the environment comes from the motivation of the public, government, stakeholders and consumers so that stakeholder theory and signaling theory are urgently needed because investors are currently considering investing in companies that provide benefits to stakeholders. Based on the explanation above, the hypothesis that can be formulated is:
H3a: Moderation of ROA strengthens the positive relationship between eco-efficiency and firm value
H3b: Moderation of ROE strengthens the positive relationship between eco-efficiency and firm value.

Methods

This study uses secondary data. The population used in this study are energy companies listed on the Indonesia Stock Exchange. The research data was obtained directly from the annual reports of energy sector companies listed on the Indonesia Stock Exchange for 2017-2021 which are contained on each company's website. The sampling technique used purposive sampling technique. The criteria used are:

1. Energy sector companies listed on the Indonesia Stock Exchange in 2017-2021
2. Energy sector companies publish financial and annual reports
3. Companies that provide the required and complete information related to the variables of this study

Based on the sample criteria that have been selected for this study, there are 34 energy companies listed on the Indonesia Stock Exchange. Energy companies that are not included in the criteria are 6 companies. Then the research sample obtained is 28 companies for each year. Where the period used in this study is 2017-2021.

Firm Value

Jensen (2002) Firm value is an assessment of public trust in a company by looking at the company's performance during the period from its establishment until the company continues to operate. The value of the company provides shareholder wealth when the company's share price rises. The company value is determined based on the book value of the Price Book Value stock. This ratio is a way of determining the intrinsic value of a stock to measure a company's performance in creating high value for its business. PBV is measured by dividing the stock price by the book value of the stock. The following is the PBV calculation formula according to Tio & Putra Prima, (2022).

$$\text{PBV}=\frac{\text{Market Price Per Common Share}}{\text{Book Value Per Common Share}}$$

Eco-efficiency

Eco-efficiency is a concept that refers to companies being able to improve their environmental performance so they can produce goods and services that are more useful and can reduce the company's impact on the environment (Fadul, 2019). According to Panggau and Septiani, (2017) measuring eco-efficiency uses a dummy value. Companies implementing eco-efficiency get a score of 1 and companies that have not implemented eco-efficiency get a score of 0. In this study, if an eco-efficiency company has ISO 14001 certification standards (Al-Najjar & Anfimiadou, 2012); (Sinkin et al., 2008). The ISO 14001 standard is a document related to environmental system requirements obtained from the company's annual report. Implemented ISO 14001 can reduce environmental damage, encourage the efficiency of company business processes, increase competitiveness and create value that benefits the government, employers and society.

Financial Peformance

This study uses ROA and ROE proxies to determine the impact of financial performance on firm value and to determine financial performance using ROA and ROE proxies can strengthen or weaken the relationship between eco-efficiency on firm value. An important factor for measuring the performance of a company in achieving the goal of obtaining high profits by measuring financial performance. This study uses profitability ratios proxied ROA (return on assets) and ROE (return on equity) to measure a company's financial performance. According to Kashmir (2015), this ratio is an assessment of the company's performance to generate profits, this ratio can be a measure of the efficiency of company management. The better the profitability, the better it describes the company's performance in generating large profits and showing good company performance, and the better the firm value is Brigham, (2016). ROA (return on assets) is a ratio to measure a company's performance in obtaining a return on its assets based on the profits it generates. The high value of ROA (return on assets), means that companies using assets more efficiently will benefit. The formula for finding ROA (return on assets) according to Fahmie, (2018) is net income divided by all total assets.

$$\text{ROA}=\frac{\text{Net Profit After Tax}}{\text{Total Assets}}\text{x}100\%$$

ROE (return on equity) is a ratio to measure the ability of equity to benefit all shareholders. The high value of ROE (return on equity) reflects the company's performance in generating high profits for shareholders. An increase in the return on company equity from year to year means that net profit can be used as an indicator that the company's value is increasing, because this increase in the company's net profit causes stock prices, which means an increase in company value (Anggriani and Amin, 2022). The ROE (return on equity) calculation formula is as follows (Yahya & Fietroh, 2019):

$$\text{ROE}=\frac{\text{Net Profit After Tax}}{\text{Total Equity}}\text{x}100\%$$

This study uses panel data regression model analysis. Analysis of the panel data regression model is used to examine the effect of eco-efficiency on firm value and financial performance in prorated using ROA (return on assets) and ROE (return on equity) as moderators. The regression coefficient is calculated simultaneously with two objectives. First, minimizing the deviation between the value of the dependent variable and the estimated value of the dependent variable based on existing data (Ghozali, 2013). Therefore, the analysis model can be presented as follows:

$$\text{NP}=\alpha+ \beta 1\text{EF}+ \beta 2\text{FPRA}+ \beta 3\text{FPRE}+ \varepsilon \ (\mathbf{1})$$

$$\text{FV}= \alpha+ \beta 1\text{EF}+ \beta 2\text{FPRA}+ \beta 3\text{FPRE}+ \beta\text{EF*FPRA}+ \beta\text{EF*FPRE}+ \varepsilon\ldots \ (\mathbf{2})$$

Description:

FV	: Firm Value
α	: Constant
β	: Regression Coefficient
EF	: Eco-efficiency
FPRA	: Financial Peformance (return on assets)
FPRE	: Financial Peformance (return on equity)
E	: Error

Results and Discussion

Descriptive statistics provide a summary or description of a data derived from the average value (mean), standard deviation, maximum and minimum values (Ghozali, 2016). As can be seen in table 2, the company value variable has a mean value of 1.183286 from the highest value of 9.9. According to Damas et al., (2021) this means that the level of corporate value presented by 28 energy companies in Indonesia is quite good because the minimum value is at 0.1. Meanwhile, the eco-efficiency variable has a mean value of 0.8857143 with a standard deviation value of 0.3193004. This means that the number of companies that have ISO-14001 certification in each energy company is an average of 88.57%. On the other hand, the average value of financial performance which is proxied using ROA is 1.8045 with a standard deviation value of 9.549654 while the maximum value is 63.73 and the minimum value is -0.13. While the average value of financial performance proxied using ROE is 0.1561429, the standard deviation value is 0.1996205, while the maximum value is 1.25 and the minimum value is -0.21. Overall, descriptive statistics for each variable are shown below.

Table 1. Descriptive Statistics Results

Variable	Mean	Std. Deviation	Min	Max
FV	1,183286	1,606324	0,1	9,9
EF	0,8857143	0,3193004	0	1
FPRA	1,8045	9,549654	-0,13	63,73
FPRE	0,1561429	0,1996205	-0,21	1,25

Source: Data Processed (2022)

Hypothesis Test Results

The results of the hypothesis test are used to determine the effect of eco-efficiency, with financial performance as a moderator proxied using ROA (return on assets) and ROE (return on equity) on the value of energy sector companies listed on the Indonesia Stock Exchange. Table 3 explains model 1, namely the effect of eco-efficiency, financial performance using ROA and ROE proxies on firm value. Table 4 explains model 2, namely the effect of financial performance using ROA (return on assets) and ROE (return on equity) proxies in strengthening the eco-efficiency relationship to firm value.

Table 2. Results of Hypothesis Testing Model 1

Independent Variable	Dependent Variable FV			
	Coeff.	Std. Err.	z	P > z
Const	0,5374924	0,1709799	3,14	0,002
EF	0,6133215	0,2394796	2,56	0,010**
FPRA	-0,0077179	0,0030597	-2,52	0,012**
FPRE	0,7460644	0,839449	0,89	0,374
R-square within	0,0065			
Wald Chi2	8,79			
Prob>Chi2	0,0323**			
No. observation	140			

***1% significance, **5% significance, *10% significance

Source: Data Processed (2022)

Table 3. Model 2 Hypothesis Test Results

Independent Variable	Dependent Variable (FV)			
	Coeff.	Std. Err.	z	P > z
Const	0,5684472	0,1949875	2,92	0,004
EF	0,5765518	0,2491358	2,31	0,021**
FPRA	-6,1844	5,182017	-1,19	0,233
FPRE	2,615997	2,286556	1,14	0,253
EF_FPRA	6,176809	5,182448	1,19	0,233
EF_FPRE	-1,835139	2,561389	-0,72	0,474
R-square within	0,0085			
Wald Chi2	12,63			

Prob>Chi2	0,0271**
No. observation	140

***1% significance, **5% significance, *10% significance

Source: Data Processed (2022)

Test Results of the Effect of Eco-efficiency on Firm Value

Testing hypothesis 1 is testing whether eco-efficiency has a positive influence on the value of energy sector companies listed on the Indonesia Stock Exchange. As shown in table 3, hypothesis 1 testing shows that eco-efficiency has a positive effect on firm value with a coefficient of 0.6133215 at a significance level of 5%. This proves that companies implementing eco-efficiency have increased their company value compared to companies that have not implemented eco-efficiency. Hypothesis 1 which says that there is a positive effect of eco-efficiency on firm value is supported at a significance level = 5%. There are 124 companies implementing the eco-efficiency concept, while 16 companies have not implemented the eco-efficiency concept out of a total of 140 samples of energy companies. Companies that have implemented the eco-efficiency concept have a higher chance of having greater corporate value than companies that have not implemented the eco-efficiency concept. This supports the stakeholder theory argument that companies that provide benefits to the environment, shareholders, society will increase the value of the company. Eco-efficiency acts as a management controller to reduce the company's impact on the environment so as to provide high value for shareholders (Dewi & Rahmianingsih, 2020). These results are in line with research by Osazuwa & Che-ahmad, (2016), Sinkin et al., (2008), Panggau & Septiani, (2017), Al-Najjar & Anfimiadou, (2012) all found eco-efficiency results had a positive effect on the value of the company.

Test Results of the Effect of Financial Performance on Firm Value

Testing the second hypothesis tests whether the proxied financial performance using ROA (Return on Assets) and ROE (Return on Equity) has a positive influence on the value of energy sector companies listed on the Indonesia Stock Exchange. As seen in table 3, testing of hypothesis 2a ROA shows that there is a negative relationship between financial performance proxied using ROA on firm value with a coefficient of -0.0077179 at a significance level of 5% in a negative direction. This shows that the performance of company management in using company assets is not managed properly. Therefore, hypothesis 2a which says that the positive impact of financial performance is proxied by using ROA (return on assets) on firm value is rejected. Hypothesis 2a shows that companies cannot manage assets effectively so that net profit is small. From the descriptive statistics the financial performance variable is proxied using ROA shown in table 2 that the average value is 1.8045, which means that the company's assets are 180.45% larger than the company's net profit so that asset management is ineffective which results in a small net profit obtained by the company (Triagustina et al., 2015). The results of testing the second hypothesis are in line with research by Triagustina et al., (2015) that ROA has a negative impact on firm value. Adrianingtyas' research, (2019) also suggests that return on assets has a negative impact on company value.

Meanwhile, ROE (return on equity) tests whether it has a positive impact on the value of energy companies listed on the Indonesia Stock Exchange. It can be seen in table 3, testing hypothesis 2b ROE shows the result that there is no effect of financial performance proxied by using return on equity on firm value with a value of 0.374> 0.05 at a significance level of 5%. Hypothesis 2b states that there is a positive impact on financial performance proxied by using return on equity on firm value is rejected. With a descriptive statistical value of 15.61%, ROE can be replaced with other ratio measurements that may affect financial performance on firm value. This research is in line with the research of Kolamban et al., (2020) which found that ROE (return on equity) has no effect on company value.

Results of Testing the Effect of Financial Performance in Strengthening Eco-Efficiency on Firm Value

The third hypothesis is to test whether financial performance using ROA (return on assets) and ROE (return on equity) proxies strengthens eco-efficiency in influencing the value of energy sector companies listed on the Indonesia Stock Exchange. Table 4 presents the results of the overall hypothesis testing of this study. As seen in table 4, testing the hypothesis of the effect of ROA (return on assets) financial performance in strengthening eco-efficiency on firm value. Obtaining financial performance results using ROA proxies cannot strengthen or weaken the effect of eco-efficiency on firm value with a value of 0.233> 0. 05 at a significance level of 5%. Hypothesis 3a regarding the impact of eco-efficiency on firm value moderated by ROA (return on assets) is not supported. The smaller the net profit, the more inefficient asset turnover. Companies that experience a decrease in net profit will be followed by a decrease in total assets, so the company is unable to manage assets effectively and efficiently in obtaining profits (Kurniasari & Wahyuati, 2017). Investors are not interested in investing in companies whose financial performance is declining, resulting in a decrease in company value. These results are in line with the research of Kurniasari & Wahyuati, (2017), Halik, (2018), Salempang et al., (2016) showing that the ROA results have no effect.

Whereas in table 4 it can be explained that ROE (return on equity) cannot strengthen or weaken the impact of eco-efficiency on firm value with a value of 0.474> 0.05 at a significance level of 5%. Hypothesis 3b states that proxied financial performance using return on equity (ROE) can strengthen the effect of eco-efficiency on firm value is rejected. This ROA and ROE can be replaced with other financial performance measurements such as solvency ratios which may provide information or explanations that will affect the value of the company. The company is obliged to re-evaluate the company's outlook in the future so that it is more productive so that shareholders will experience greater returns from the cost of capital (Kolamban et al., 2020). This result is in line with previous research which found that return on equity (ROE) had no effect (Kolamban et al., 2020), (Agustina & Ardiansari, 2015).

Conclusion

The effect of eco-efficiency on the value of energy sector companies listed on the Indonesia Stock Exchange is discussed in this study. The results of the analysis show that eco-efficiency has a positive effect on firm value, reflecting the category of good influence on the environment. This supports the stakeholder theory argument that companies that provide benefits to the environment, shareholders, society will increase the value of the company. Eco-efficiency acts as a management controller that reduces the company's environmental impact thereby providing high value

The results of testing financial performance are proxied using ROA (return on assets) on firm value which has a negative effect. This proves that the performance of the company's management in using the company's assets is not managed properly so that the net profit is getting smaller so that the company can be predicted to result in a decrease in investor interest in investing. While testing financial performance using ROE (return on equity) proxies on firm value has no effect in measuring financial performance not only measured using ROA and ROE, there are many other possible measurements that can affect firm value. Such as measuring financial performance using Debt ratio, Current ratio, Net profit margin.

The results of testing financial performance using ROA (return on assets) and ROE (return on equity) proxies which moderate the effect of eco-efficiency on firm value have no effect. This means that financial performance using ROA (return on assets) and ROE (return on equity) proxies cannot strengthen or weaken the effect of eco-efficiency on firm value. This is because the measurement of financial performance using ROA and ROE proxies is one of the other ratio measurements such as Return on investment, Tobin's Q, Net Profit Margin, Leverage. Further research is recommended to use measurements other than ROA and ROE which allow obtaining good results for company value. Companies that experience a decrease in net profit will be followed by a decrease in total assets, so the company is unable to manage assets effectively and efficiently in obtaining profits. Companies must re-evaluate the company's outlook in the future in order to increase productivity, so that shareholders get a large return on their cost of capital. It is hoped that in the future, the results of this research will contribute to the company as well as maintaining and maximizing management related to the company's performance in a sustainable manner and to increase the company's contribution to national energy security. Further research is recommended to use sectors other than the energy sector, such as manufacturing, healthcare or other industrial companies where there are probably still many companies in this sector whose internal performance is still focused on maximizing profits but it is not yet known whether there are companies that still do not have ISO 14001 certification standards..

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