

## Profitability as a Moderator in the Implementation of Environmental Management Accounting for Corporate Sustainability

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### ABSTRACT

This study aims to examine the effect of implementing environmental management accounting on corporate sustainability moderated by company profitability in mining and manufacturing companies listed on the Indonesia Stock Exchange from 2019-2022. Environmental management accounting is measured by eco-efficiency, and company sustainability is measured by GRI standards using content analysis with a scoring approach in assessing environmental and social achievements. Profitability is measured by return on equity (ROE). This research uses a panel data method with a fixed effect model approach. The sampling technique was purposive sampling with the criteria of companies that publish annual reports, and disclose sustainability reporting successively during the 2019-2022 period so that a total of 33 companies were obtained. The research results show that there is a positive influence on the application of environmental management accounting on corporate sustainability strengthened by profitability as a moderator. The application of environmental management accounting can increase its influence on corporate sustainability when the company's profitability is high. This condition is expected to have an impact on achieving corporate sustainability by fulfilling economic, environmental, and social aspects by the triple bottom line concept as a pillar that can create a sustainable business.

Keywords: Corporate Sustainability, Environmental Management Accounting, Profitability.



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### INTRODUCTION

At present, environmental issues are considered to be a serious matter throughout the world, so it is necessary to pay much greater attention to their handling (Kraus et al., 2018)]. Every company in various sectors is now facing economic issues (Zhu et al., 2013), social issues (Paulraj, 2011) and environmental issues (Laosirihongthong et al., 2013) which are detrimental to the environment, the general public and also the organization. Thus, one of the core problems faced by companies arises from a commitment to environmental protection (Castro et al., 2021). Misuse of natural resources and environmental pollution due to industrial waste is a problem for companies to immediately carry

out sustainable settlements. The impact is very significant for environmental sustainability and economic development.

Concern for sustainability is increasingly important among companies and stakeholders (Caiado et al., 2017). Sustainable economic, social and environmental achievements by creating corporate sustainability. Some companies are starting to take into account the use of the concept of eco-efficiency to measure the relationship between economic value and environmental impact (Pai et al., 2018). Eco-efficiency increases cost efficiency through improved environmental performance. Companies need to continue to balance economic gains with social responsibility and environmental protection to maintain corporate sustainability in a highly competitive market (Tomšič et al., 2015). Companies that rely directly on natural resources need to make efforts to address the environmental responsibility of their business activities, pay attention to the preservation of natural resources, and understand the relationship between the resources used.

In addition, what is equally important in achieving environmental and economic balance is the factor of leadership. Leaders need to create a favorable and collaborative environment for innovation processes and human capital investment. The assumption is that innovative human resources have a significant positive effect on the destruction of the company have an impact on the welfare of the company's employees and the surrounding economy (Tomšič et al., 2015). Companies must be aware of social welfare for both their employees and residents around the company (Sze & Brocke, 2017).

From the statement above, environmental concern (planet), economic performance (profit) and human resource welfare (people) have described the triple bottom line concept. The definition of sustainable performance is applied by (Elkington, 2017), taking into account economic, social, and environmental performance. The triple bottom line is a tool for measuring disease (Arowoshegbe et al., 2018). In line with this, the concept of sustainable development emerged to create a balanced environment, economy, and sustainable development by applying environmental management accounting methods as an information system that allows users to obtain information that reflects a company's environmental performance.

Environmental management accounting is one of the environmental accounting concepts used to manage environmental costs arising from company activities. Environmental management accounting plays a role in achieving business eco-efficiency, namely by maintaining the production of goods and services that are more useful but still able to reduce the environmental impact caused. To measure the extent to which environmental management accounting influences company sustainability, this research uses eco-efficiency indicators. This is one of the concepts used by a company to declare itself as an environmentally friendly company (Hutman falih Chichan et al., 2021). Limited disclosure of environmental information that is not available in the company's financial statements will affect management decisions. The unavailability of information regarding environmental impacts due to the company's operational activities will result in decisions that will later hurt the value and sustainability of the company. In contrast, when a company implements environmental management accounting, the company gains a competitive advantage and increases corporate value by implementing corporate social responsibility (Tanc & Gökođlan, 2015).

If examined more deeply, in the long run, the application of environmental management accounting will be very beneficial for all parties, both for companies, consumers, and stakeholders such as investors and the public. The sacrifices made by companies in paying for the environment can reduce potential expenses in the future, such as costs due to community demands for environmental destruction by companies, and sanctions from the government. Potentially, it contributes to company value and company profitability. Companies that apply environmental management accounting with the assumption can achieve the implications of stakeholder theory. This shows that the activities carried out by the company are not only focused on making profits but also contribute to preserving

nature. Stakeholder theory explains that companies exist to meet all of the company's stakeholders. Through the application of environmental management accounting concepts, companies try to gain stakeholder support in the hope of having a positive impact on increasing profitability. Profitability achieved by the company can be used as an indicator for investors in assessing the company's performance. A high level of profitability illustrates the company's ability to generate high profits so that companies can increase social responsibility and disclose it in annual reports more broadly (Sari, 2012). In the concept of environmental management accounting, companies that are consistent in increasing profitability can be said to be investing in the long term by implementing an environmental management system. That is, the better the company's profitability growth, the better the company's opportunities in the future in the eyes of investors.

Corporate sustainability is an interesting phenomenon to study to date. State of the Art and the novelty of this research lies in the variables studied by adding a moderating variable, namely profitability. Profitability is the company's ability to generate profits from business activities. The high level of profit achieved by the company shows the company's effectiveness in managing resources. When profitability increases, the management of environmental costs is increasingly controlled and the company carries out more social or philanthropic activities so that the information provided by managers regarding environmental management is also disclosed in the company's sustainability report.

The application of environmental management accounting involves great efforts aimed at assisting companies in dealing with environmental problems. The presence of environmental management accounting provides benefits for companies to achieve good environmental performance. The energy crisis and environmental changes have affected all aspects of human life including the economic aspect. With the existence of environmental management accounting, there is the information needed by company management as well as environmental information to help management make decisions regarding prices, controls, and capital budgets, for external users. On the other hand, with environmental accounting, companies can improve efficiency and sustainably improve service quality.

## **METHODS**

This study uses the panel data method with the fixed effect model approach. Panel data regression is a combination of cross-sectional data and time-series data. The same cross-section unit is measured at different times (Ertur & Musolesi, 2016). This method was chosen to determine the effect of variables from many periods. This quantitative study was used to test hypotheses by measuring research variables with numbers and conducting data analysis using statistical procedures. The sample in this study are companies in the mining and manufacturing sectors listed on the Indonesia Stock Exchange for the 2019-2022 period. The sampling technique was purposive sampling with the criteria of companies issuing annual reports and disclosing sustainability reports consecutively during the 2019-2022 period, a total of 33 companies were obtained as samples.

The data collection technique in this research is a documentation study carried out by collecting secondary data, recording, and processing data related to this research. The secondary data used by the author in this research is data taken from the company's annual financial reports and sustainability reports from 2019-2022. This research was designed using the variable implementation of environmental management accounting as an independent variable which was measured by eco-efficiency with indicators of economic and environmental achievements. In this research, the value of a product or service is measured by net sales (net value), and the environmental impact is measured by total energy consumption (eco-cost). Energy data comes from corporate sustainability reporting.

The corporate sustainability variable as the dependent variable is measured by GRI-Standards using content analysis with a scoring approach in assessing environmental and social achievements. Every reporting and disclosure of activities by the sample company will be given a value of "1" and a value of "0" if it is not disclosed. After weighing the values on all items, these values are accumulated to produce the total value of the entity. The profitability variable as a moderating variable is measured using Return on Equity (ROE). The ROE ratio was chosen as the company's ability to manage shareholder equity to produce high profitability values.

Furthermore, data analysis is an activity after data from all respondents or other data sources are collected (Sugiyono, 2017). Data analysis activities by grouping data based on research variables, tabulating data, presenting data for each variable studied, conducting statistical tests to answer the problem formulation, and testing the hypotheses that have been proposed in this study. Statistical hypothesis testing can be measured from the value of the coefficient of determination, the value of the F statistic, and the value of the t statistic. Statistical calculations are called statistically significant if the statistical test values are in the critical area with a significance level  $<0.05$ , where  $H_0$  is rejected. Conversely, it is called insignificant if the statistical test value is at a significance level of  $> 0.05$ , where  $H_0$  is accepted.

## RESULTS AND DISCUSSION

### RESULTS

This study uses data analysis techniques for multiple linear regression panel data with the moderating effect of Moderated Regression Analysis (MRA). The panel data regression analysis technique is a combination of cross-section data with time series data, where the same cross-section units are measured at different times (Kuncoro, 2011). This model can be used to determine the effect between variables (Nandita et al., 2019). The panel data regression test in this research was used to determine the relationship between the independent variable implementation of environmental management accounting on the dependent variable corporate sustainability and the moderating variable profitability to measure the strength of the relationship between the independent variable and the dependent variable. The data processing tool in this study uses Eviews 10 software.

The first step in panel data analysis in this research is to tabulate data between variables. Second, determine the estimation of the panel data regression model. The purpose of panel data regression model is used to determine the most appropriate parameters of the three regression models (common effect model, fixed effect model, and random effect model) (Srihardianti et al., 2016) in this study and determine the relationship of environmental management accounting to corporate sustainability moderated by profitability. Third, carry out hypothesis testing. Statistical hypothesis testing can be measured from the coefficient of determination value, the F statistical value, and the t statistical value. Statistical calculations are called statistically significant if the statistical test values are in the critical area with a significance level  $<0.05$ , where  $H_0$  is rejected. Conversely, it is called insignificant if the statistical test value is at a significance level of  $> 0.05$ , where  $H_0$  is accepted.

### Selection of Panel Data Estimation Model

**Table 1. Chow test results**

Effect Test	Statistic	Prob.
Cross-section Chi-square	154.432645	0.0000

Source: Eviews Output 10, 2023

Based on table 1, shows the results of the chow test with a probability value of less than alpha ( $\alpha$ )  $<0.05$ . Where the value of the Chi-square Cross-section probability is 0.0000. Thus, the model used in this study based on the Chow test is the fixed effect model.

**Table 2. Hausman Test Results**

Test Summary	Chi-Sq. Statistic	Prob.
Cross-section random	10.375540	0.0056

Source: Eviews Output 10, 2023

Table 2 shows the results of the Hausman test with a probability value less than alpha ( $\alpha$ ) < 0.05. Where the value of the random cross-section probability is 0.0056. Thus, the model used in this study based on the Hausman test is the fixed effect model. Both the Chow test and the Hausman test found that the fixed effect model was the best model to test this research.

### Hypothesis Testing

**Table 3. Determination Coefficient Test Results**

R-squared	0.760143
Adjusted R-squared	0.676069

Source: Eviews Output 10, 2023

Based on Table 3 above, shows that the Adjusted R-squared value is 0.676069 or 67.60%, meaning that this figure shows the large influence of the independent variable and the moderating variable has an influence of 67.60% on the dependent variable, while 32.40% is influenced by other variable factors besides from this research.

**Table 4. F Test Results**

F-statistic	9.041404
Prob(F-statistic)	0.000000

Source: Eviews Output 10, 2023

The F test aims to test the influence of the independent variable and moderating variable together or simultaneously on the dependent variable. Based on Table 4 above, it is known that the calculated F value is greater than the table F value ( $9.041404 > 3.07$ ), with a significance value of  $0.000000 < 0.05$ . Thus,  $H_0$  is rejected, and  $H_a$  is accepted, which means that the independent variable and moderating variable if tested together or simultaneously, affect the dependent variable.

**Table 5. t-Statistic Results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.756739	0.055924	-13.53161	0.0000
Eco-Efficiency	0.297111	0.040292	7.373894	0.0000

Source: Eviews Output 10, 2023

Based on Table 5 above, the results of the t-statistical test for the environmental management accounting variable which is proxied by eco-efficiency shows a regression coefficient value of 0.297111 with a probability of  $0.0000 < 0.05$  while the calculated t value is  $7.373894 > t$  table 1.97838 where  $H_0$  is rejected  $H_1$  is accepted, meaning that the implementation of environmental management accounting has a significant positive impact on company sustainability.

**Table 6. Moderated Regression Analysis (MRA) t-test results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE*Eco_Efficiency	0.013584	0.006060	2.241678	0.0273

Source: Eviews Output 10, 2023

Based on Table 6, the Moderated Regression Analysis (MRA) t-test above, the interaction of the environmental management accounting variable and the profitability moderating variable which is proxied by ROE obtained a probability value of  $0.0273 < 0.050$  and a calculated t value of  $2.241678 > t$  table 1.97867 with a positive relationship, where  $H_0$  is rejected and  $H_2$  is accepted. This means

that profitability moderates the influence of the application of environmental management accounting on company sustainability, so it can be concluded that profitability strengthens the relationship between environmental management accounting variables on company sustainability.

## DISCUSSION

### **Effect of implementing environmental management accounting on corporate sustainability**

Based on the statistical test results above, shows that environmental management accounting has a positive effect on corporate sustainability. Environmental management accounting which is proxied by eco-efficiency in this study is a form of company policy to make efficient use of resources used to reduce adverse impacts on the environment such as waste and pollution. That is, the high or low value of the company's eco-efficiency shows the amount of energy consumption by the company. This shows that by implementing resource efficiency which can harm the environment, companies are considered to have a better future compared to companies that do not implement eco-efficiency.

This research is supported by research (Hutman Falih Chichan et al., 2021) that the application of environmental management accounting can improve the economic, environmental, and social dimensions of sustainability. (Pratiwi et al., 2020) environmental management accounting has a positive impact on the environment and society and is a determining factor in corporate sustainability. Furthermore, research (Dewi & Rahmianingsih, 2020) shows that there is a positive and significant influence of environmental efficiency strategies in the application of environmental management accounting. Research (Nikolaou & Matrakoukas, 2016) uses environmental management accounting to increase eco-efficiency in various industrial sectors can increase the company's environmental performance. The implications of the concept of environmental efficiency strategy are linked to the practice of implementing environmental management accounting to encourage companies to develop their level of environmental performance. These efforts can reduce environmental impacts and excessive resource consumption.

Company sustainability depends on management's role in decision-making to achieve goals in improving environmental performance. In this case, corporate governance is the key to achieving corporate sustainability goals. Stakeholder theory explains that companies do not just act in their own interests, but can bring benefits to stakeholders so that companies that express their social responsibility can give trust to stakeholders (Fitriani & Purnamasari, 2023). In the context of corporate sustainability, stakeholder theory helps identify and overcome difficulties regarding the relationship between successful business operations and environmental and social achievements (Schaltegger et al., 2019). Companies that engage in environmental, social, and governance activities balance the interests of all stakeholders and ultimately obtain long-term corporate sustainability performance (Alareeni & Hamdan, 2020).

### **The influence of profitability in moderating the application of environmental management accounting on corporate sustainability**

The results of the research on the moderating variable show that profitability can strengthen the effect of implementing environmental management accounting on corporate sustainability. That is, the effect of implementing environmental management accounting on company sustainability is strengthened because the company is at a high level of profitability. High profitability indicates good company performance, and with high-profit growth, the company has shown its credibility in managing company capital. Profitability is one of the factors that influences companies in carrying out environmental and social responsibility. The agent's duties to the principal are carried out, namely to get profit, where this condition gives freedom to company management to carry out social responsibility which is also a step to maintain good relations with stakeholders (Pradnyani & Sisdyani, 2015). When a company has shown concern for the environment and is supported by significantly high corporate profitability, it will attract and even grow investor interest to invest in the hope that this condition will have an impact on the sustainability of the company. The findings

in this study are in line with (Mardiana & Wuryani, 2019), (Osazuwa & Che-Ahmad, 2016), (Denisia Komalasari, 2017).

The application of environmental management accounting can increase its influence on company sustainability when the company's profitability level is high. This research measures company profitability as proxied by Return on Equity (ROE) from the shareholder's perspective. ROE is important for shareholders to know the effectiveness and efficiency of investors' capital management carried out by the company (Sudana, 2015). The profitability ratio is the net final result of various business decisions made by the company. Profitability is used as a measure of a company's ability to make a profit. The high value of the profitability ratio shows top management's ability to manage investor capital in generating company profits. Shareholders will be satisfied with high profits so that the investors' assumption of their welfare will be guaranteed. Another finding in this research is that investors when investing their capital, do not only pay attention to economic aspects but also consider environmental and social aspects. This condition is expected to have an impact on achieving company sustainability by fulfilling economic aspects, environmental aspects, and social aspects by the triple bottom line concept as a pillar that can create a sustainable business.

## CONCLUSION

This study aims to examine the effect of implementing environmental management accounting on corporate sustainability with profitability as a moderator. The main findings in this study indicate that the application of environmental management accounting proxied by adopting eco-efficiency can create corporate sustainability. The efficient use of energy in a company's operations can be a determining factor for the company's sustainability in the future. Eco-efficiency in energy use can affect company sustainability in environmental and social aspects. The more efficient the use of energy, the higher the company's chance to be sustainable.

Profitability was found to positively moderate the relationship between the implementation of environmental management accounting and corporate sustainability. The application of environmental management accounting can increase its influence on company sustainability when the company's profitability level is high. When a company has shown its concern for the environment and is supported by significantly high company profitability, it will attract and even grow investors' interest in investing in the hope that this condition will have an impact on the company's sustainability.

The application of environmental management accounting provides accurate information by prioritizing the dimensions of sustainable development, environmental and social dimensions, and economic dimensions. This study recommends that other companies in Indonesia need to apply environmental management accounting because of the importance of providing information that leads to reducing negative environmental impacts due to company operational practices.

The limitations of this research firstly lie in the research data, the research sample is limited to the mining and manufacturing sectors listed on the Indonesia Stock Exchange for the 2019-2022 research period. Second, eco-efficiency is measured in the aspect of electrical energy use. Third, profitability is projected with one ROE indicator, there are several indicators to assess profitability ratios, such as Return on Assets, Return on Invested Capital, etc.

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