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The Moderating Role of Environmental Investment on The Relationship of Environmental Responsibility and Firm Value

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Abstract

Purpose – The purpose of this study is to examine how environmental responsibility (ER) affects business value and how environmental investment (EI) influences the link between the two.

Design/methodology/approach – This research uses quantitative method. The study's data came from 399 observations of mining and public energy businesses in ASEAN-5 between 2017 and 2019. Multiple regression and a panel data technique were used for data processing.

Findings – The results of the study indicate that environmental responsibility can significantly increase firm value. Then, environmental investment has a significant positive effect on firm value. However, environmental investment has not proven to be able to provide a moderating effect on the relationship between environmental responsibility and firm value

Originality/value – This paper presents an original and timely contribution to the ongoing discussion regarding environmental responsibility (ER) role and environmental investment (EI) in enhancing firm value, particularly within the context of ASEAN-5 countries—Malaysia, Indonesia, the Philippines, Singapore, and Thailand. While existing studies on ER and its effect on firm value have largely focused on developed countries, the exploration of this relationship within the ASEAN-5 context is novel. The ASEAN-5 region is a critical area for examining these dynamics because of its unique economic and environmental challenges, and this research aims to provide empirical evidence on how ER and EI practices impact firm value in these countries.

Research limitations/implications – There were still only a few observations in this study, and secondary data was still employed. Governments in every nation should take note of the policy implications of this research, which include the need to implement laws requiring businesses to make environmental investments and to actively engage in and advance green practices.

Keywords: environmental responsibility, environmental investment, firm value, competitive advantage, ASEAN-5

Article Type: Research Paper



Introduction

Environmental challenges are a major obstacle to achieving SDGs worldwide. Based on data from Kulkarni and Aggarwal (2022) companies are one of the main factors that contribute to efforts to achieve SDGs through activities to fulfill environmental protection and promotion in accordance with the objectives of several SDG targets. Companies that take the initiative and are sensitive to environmental issues can improve the company's image and create the greatest value for shareholders (Zeng et al., 2020). Companies must be able to support environmental SDGs through Environmental Responsibility practices in order to address these issues (Kulkarni & Aggarwal, 2022).

Environmental Responsibility (ER) is part of the Corporate Social Responsibility (CSR) aspect that encourages companies to integrate environmental factors into daily operations and management based on the concept of sustainable development, corporate profits and environmental protection (Li et al., 2020). Based on data from the European Union National Statistics, it is revealed that more than 50% of CSR activity expenditures are used for environmental protection activities and investment in environmental projects (Eurostat, 2018). ER has gained international traction and is advantageous for the company's long-term strategy, giving it a competitive edge (Lloret, 2016). Furthermore, according to stakeholders, ER is essential for businesses to provide strong performance, which can raise firm value (Maaloul & Mansour, S., 2023). The majority of earlier studies on the impact of ER on business value were carried out in industrialised nations. where there is still diversity in the research findings. According to studies done in the US, Korea, and Italy, ER increases firm value, which is a sign of improved business success (Gerged, A. M., Beddewela, E., & Cowton, C. J., 2021, Tseng et al, 2020). However, ER operations have been proven to have a detrimental impact on firm value in Australia, China, and Europe (Li et al., 2020).

In light of the disparities in outcomes, it would be highly desirable to conduct additional study on the impact of ER on business value. Since ER can effectively manage the environment to support the implementation of SDGs, it can offer policymakers a conceptual paradigm. This assertion is consistent with the suggestions made by Qin and Chen (2019), who clarify that more research should be done in the future to analyse ER practices using empirical studies in the context of various nations, particularly emerging nations, on changes in firm value. In order to better understand the relationship between ER and firm value, this study will re-examine it in the context of Southeast Asian nations that are members of the Association of Southeast Asian Nations (ASEAN), particularly those in ASEAN-5, which includes Malaysia, Indonesia, the Philippines, Singapore, and Thailand.

The disclosure of the framework in ASEAN-5 is still voluntary, so good framework conditions are needed to obtain performance similar to the wider market. The strategy that can be carried out must be in the most proactive way in order to achieve sustainable development. One indicator that can determine the most proactive ER framework is the application of innovation used by the company. Based on the legitimacy theory, companies need to implement ER strategies effectively through environmental investment. Environmental investment (EI) is very important for designing policy incentives in company performance (Xu, et al 2024). EI is an environmental activity carried out during business activities such as spending on environmental improvement costs, or environmental investment costs to reduce the negative impacts of company activities (Bhuiyan et al., 2021). Several previous studies related to EI still face challenges, due to the limitations of qualitative and quantitative aspects and prediction models in determining EI. This study views the existence of EI as a quantitative aspect because it is considered the most effective form in determining a number of expenditures in managing environmental problems that can design policies that lead to increased firm value.

Previous studies related to El have so far mostly been conducted in Asian countries (Khalil, M. A., & Nimmanunta, K., 2023; Wang et al., 2021). In addition, companies that implement optimal El strategies can produce new products or services to obtain better environmental activity attributes (Xue et al, 2022). Therefore, the integration of environmental aspects in the form of El becomes a primary requirement in unifying and promoting business aspects and environmental protection and

conservation (Chichan & Alabdullah, 2021). This explains why a company's implementation of ER increases with its level of EI implementation. As a result, this study is worth looking into further since it offers empirical support for the idea that EI in ER affects firm value in ASEAN-5.

Literature Review

Environmental Responsibility (ER) and Corporate Value

In order to match business values with environmental protection initiatives, ER is one of the tools available through corporate responsibility (Li et al., 2020). ER bases its implementation of environmental responsibility on the interests of internal and external stakeholders. Traditional economists perceive ER as a type of loss since the operations can lower profitability, which would impair the company's financial performance (Garel & Petit-Romec 2021). This view is in line with research conducted by Maaloul and Mansour (2023) in Bangladesh which found that companies that are responsible for environmental impacts tend to involve very large costs because they can reduce the company's equity financing costs and can shift the company's core resources which create relative losses and get little incentive (Gerged, A. M., Beddewela, E., & Cowton, C. J., 2021).

Nevertheless, if ER is effectively managed, the business can use it as a source of competitive advantage in the marketplace since it can build a positive reputation among staff, customers, and other government agencies, which will raise the firm's value (Tseng et al., 2020). ER is a type of emerging power that can expand and boost the firm's value in managing relationships with stakeholders for business objectives, in accordance with stakeholder theory (Liao et al., 2021). This suggests that enhancing ER skills can raise the firm's worth. in order for ER to be a successful tactic (Cai et al., 2016). By employing this strategy, stakeholders will support the business by providing a range of resources and facilities that increase the firm's worth. Therefore, the following hypothesis is proposed: H_1 : ER has a positive effect on firm value

Environmental Investment (EI) and Firm value

El is part of a company's efforts to gain legitimacy from the community and stakeholders by spending a number of costs in the context of environmental management that has an impact on the sustainability of the company in the future. In addition, Awan and Gölgeci (2021) El is very important for companies to implement in order to design policy incentives and company performance. These results are confirmed by the analysis of Yang et al. (2020) that also found that there is a positive and significant correlation between environmental conservation costs incurred by the company and the economic benefits of environmental conservation. This shows that companies that carry out El are believed to be able to strengthen consumer and shareholder trust. In addition to the above, El is believed to be an effective strategy to improve firm reputation in the eyes of stakeholders and ultimately increase the company's competitive advantage and value. In addition, according to Appannan et al. (2023) explains that companies that carry out good El will improve their company's performance in the environmental sector. The company's success in carrying out El in managing environmental problems can increase firm values (Chen and Ma, 2021). As a result, the following theory is put forth:

H₂: EI has a positive effect on firm value

Environmental Investment (EI), Environmental Responsibility (ER) and Firm value

Basically, companies need to build their image and public concern for their performance. Companies need to prove that what they do and their achievements are proven to provide added value to society. El can preserve the environment and prevent environmental pollution so that it can achieve good environmental performance because there are a number of costs incurred by the company to carry out green management (Tian & Lin, 2019).

Investment in the form of EI can be used as a strategy for implementing ER activities in business operational activities that can produce new products or services to obtain better environmental

activity attributes (Liao et al., 2021). If the company carries out and incurs costs for preserving the company's environment, net income and economic benefits from preserving the environment for environmental activities can increase the value of the company (Kuo et al., 2010). Therefore, EI as a strategic environmental management can accelerate the development of a more sustainable business, which ultimately contributes to the long-term success of the company. Therefore, the role of EI in environmental production practices, especially ER, can improve environmental performance which ultimately increases firm value

According to legitimacy theory, the more favourable a public perception, the easier it is for the institution to get support. Therefore, the better the company implements EI practices, the more it can respond to stakeholder concerns about social responsibility and build a good reputation. Another reason is that EI can help organizations make efforts to save and appropriately use resources sustainably so that they can align industrial development with the preservation of environmental functions and can provide benefits to the community in order to maximize the value of the company. Therefore, the following hypothesis is proposed:

*H*₃: Environmental investment strengthens the positive influence of Environmental Responsibility on firm value.

Methods

This kind of study employed quantitative techniques and descriptive analysis. In this study, ER, or corporate environmental responsibility, was described using descriptive analysis and the application of EI. The purpose of this study is to ascertain how the company's use of EI moderates the impact of ER on firm value.

Research Data and Samples

Public corporations in the ASEAN-5 nations make up the study's population. Malaysia, Indonesia, the Philippines, Singapore, and Thailand are among the ASEAN-5 nations' businesses. Businesses with financial reporting that use sustainability reporting and annual reports to present both financial and non-financial data. Mining and energy firms make up the study's sample. Energy and mining companies were chosen because, according to Kumar and Kumar (2021), they have a significant environmental impact because they are categorised as sensitive industries that generate negative sentiment from their operations. Other factors that contribute to environmental issues include waste, climate change, the depletion of natural resources, and pollution of the air and water. As such, they tend to disclose environmental information more than other industrial companies.

The period in this study was 2017-2019 to illustrate the company's implementation in achieving the 2030 SDGs targets since 2017. The data for the last three years was chosen because it is considered an adequate period and fulfills the adequacy of the sample. The reason 2017 was used in the sample is because in that year the company began to commit to efforts to fulfill the SDGs targets. The limitation of the research period is only carried out until 2019. This is because in 2020 there is a case of the COVID-19 outbreak which has an impact on the economic recession which is likely to cause a decline in company performance.

Research Model

The regression model in this study refers to the research of Guo et al., (2020), Li et al. (2020) and Yang et al., (2020). In regression model 1 for hypotheses 1 and 2 in this study, it is used to see the direct effect of ER and EI on the firm value which is formulated as follows:

$$FV \ i,t = \alpha + \beta 1 \ ER \ i,t + \beta 2 \ EI \ i,t + \beta 3 \ size \ i,t + \beta 4 \ leverage \ i,t + \beta 5 \ ROA \ i,t + \beta 6 AGE \ i,t + \beta 7 \ GDP \ i,t + \varepsilon \ i,t$$

Regression model 2 for hypothesis 3 in this study is used to see the moderating effect of EI on ER and firm value which is formulated as follows:

 $FV \ i, t = \alpha + \beta 1 \ ER \ i, t + \beta 2EI \ i, t + \beta 3 \ EI * ER + \beta 4 \ size \ i, t + \beta 5 \ leverage \ i, t + \beta 6 \ ROA \ i, t + \beta 7 \ AGE \ i, t + \beta 8 \ GDP \ i, t + \varepsilon \ i, t$

Data Analysis Method

This study employed regression analysis, which initially carried out descriptive statistical testing before analysing the quality of the data using the traditional assumptions of the normality, multicollinearity, and heteroscedasticity tests. Then, using the data analysis method and the common effect model (Pooled Least Square (PLS)), hypothesis testing was done.

Results

Sample Selection Results

Data for the analysis of energy and mining companies were obtained from 193 companies from 5 countries, which were divided into several groups based on the Global Industry Classification Standard (GICS) in the energy and mining company group that is the focus of this study. Using the balanced panel approach, the study's sample size for energy and mining companies was 399 observations, with 44 Indonesian companies accounting for 132 observations, 17 Malaysian companies for 51 observations, 29 Singaporean companies for 87 observations, 25 Thai companies for 75 observations, and 18 Philippine companies for 54 observations.

Descriptive Statistics

The descriptive statistics are depicted in Table 1 below. The STATA output for descriptive statistics is presented in the appendix.

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Variable	Ν	Mean	Std.	Min	Max
			Deviation		
ER	399	0,456	0,132	0,17	0,75
EI	399	1,937	0,748	0,203	4,178
Firm Value (FV)	399	8,323	1,637	7,56	12,51
SIZE	399	10,275	1,277	9,65	13,46
Leverage (LEV)	399	0,448	0,554	0,01	2,5
ROA	399	0,122	0,325	-0,58	1,3
AGE	399	3,205	0,744	0,69	4,88
GDP	399	4,539	1,360	1,35	6,93

Table 1. Descriptive Statistics

Firm value (FV), as determined by Tobin's q, is the dependent variable in this investigation. The descriptive statistics of FV are displayed in Table 1, with an average of 8.323, a minimum of 7.56, a maximum of 12.51, and a standard deviation of 1.637. The market confidence in the company is demonstrated by the fact that the market value of mining and energy companies in ASEAN-5 is eight times their book value. In addition, the independent variables used are ER and EI. Within a period of 3 years, disclosure of environmentally responsible activities (ER) has an average value of 0.456 which means that 45.6% of environmental responsibility disclosures have been achieved, a minimum value of 0.17 and a maximum value of 0.75 and a standard deviation of 0.132. Then EI as the amount of investment issued by the company in managing environmental issues has an average value of 1.937 with a minimum value of 0.203, namely Atok Big Wedge Co Inc in the Philippines and a maximum value of 4.178, namely IRPC PCL Ltd. in Thailand and a standard deviation of 0.748.

Hypotheses Testing

Table 2 shows that the firm value (below 5%) is significantly positively impacted by the ER variable. This analysis lends support to the study's hypothesis 1a. The company value is then positively and significantly impacted by the independent variable, namely EI (below 5%). This analysis supports the validity of hypothesis 1b in this investigation.

Research Model:						
$FVit = 60 + 61ER_{it} + 62Ei_{it} + 63SIZE_{it} + 64LEV_{it} + 65ROA_{it} + 66AGE_{it} + 67GDP_{it} + e_{it}$						
Variable	Expectation	Coefficient	P-Value			
ER	+	1.204147	0.049**			
EI	+	0.1075496	0.016**			
Size	+	0.0272814	0.649			
Lev	+	0.0897289	0.520			
ROA	+	1.535452	0.000 ***			
AGE	+	-0.0718664	0.497			
GDP	+	-0.1567706	0.008***			
Constanta		6.612799	0.000 ***			
Ν		399				
Adj.R ²		0.2357 (23.57%)				
Prob > F		0.0000				

Next, Table 3 presents the test results on the moderating role of EI on the influence of ER on firm value. In the hypothesis test 2, namely the role of the EI moderating variable on the influence of ER on firm value. Based on the data analyzed, companies that have high or low EI cannot strengthen the relationship between ER and firm value (above 10%). Based on this analysis, hypothesis 2 in this study is not accepted.

Research Model:					
$FVit = 60 + 61ER_{it} + 62E$	Εi _{it} + β3EI _{it} *ER _{it} + β4SI	ΖΕ _{it} + ϐ5LEV _{it} + ϐ6RO	$A_{it} + \beta 7 A G E_{it} + \beta 8 G D P_{it} + e_{it}$		
Variable	Expectation	Coefficient	P-Value		
ER	+	1.181976	0.052*		
EI	+	0.4819975	0.035 **		
EI*ER	+	0.4490234	0.405		
Size	+	0.0163404	0.792		
Lev	+	0.0822208	0.556		
ROA	+	1.481744	0.000 ***		
AGE	+	-0.0654438	0.535		
GDP	+	-0.1501421	0.011**		
Constanta		6.391783	0.000 ***		
N		399			
Adj.R ²		0.2279 (22.79%)			
Prob > F		0.0000			

Table 3 Regression Test Results (Hypothesis 2)

Discussion

Environmental Responsibility on Firm value

Based on the results of research on energy and mining companies in ASEAN-5 countries, it can be seen in Table 2 that ER has a positive and significant effect on firm value, as evidenced by the significance value of p <0.5 with a regression coefficient of 1.204147. The results of this study are in line with the research of Meng et al., (2016); Tseng et al., (2020) and Wu et al., (2020) that companies that are responsible for ER activities can generate a good reputation so that it will have an impact in the form of increasing firm value. Because it influences the company's decisions, ER is viewed favourably by a variety of stakeholders. Transparent information with value and relevance led to the decision (Wong et al., 2018). This will add value to the business, allowing investors to place a higher value on it based on future economic, social, and environmental benefits. This remark aligns with stakeholder theory, which states that the company has effectively communicated about ER to stakeholders in order to establish it as a significant issue that can support corporate interests and raise concerns among interested parties.

According to this study, ASEAN-5 mining and energy businesses are already concerned about implementing ER operations that they can effectively manage in practice and turn into a competitive advantage in the market (Tseng et al., 2020). Another reason is that the SDGs agenda states that businesses' participation in environmental protection initiatives, such as ER practices, is a way for them to contribute to sustainable development and create value that is appropriate for their place in society (Zeng et al., 2020). Because they have potential sources of quality for corporate sustainability actors, it is evident that firms that disclose ER operations can develop strategies and acquire the legitimacy they need for sustainability performance from stakeholders (Wu et al., 2020).

Environmental Investment on Firm value

Considering the findings of studies on mining and energy firms in ASEAN-5 nations (Indonesia, Malaysia, Singapore, Philippines, and Thailand) can be seen The regression coefficient of 0.1075496 and the significance value of p <0.05 in Table 2 demonstrate that the quantity of EI issued by the company has a favourable impact on firm value. The study's findings are consistent with research by Bhuiyan et al. (2021), which found that businesses that support environmental conservation initiatives by making various environmental protection-related expenses can enhance their reputation, which in turn affects the company's long-term viability. Other studies show that firm value or financial performance will increase when companies implement adequate EI policies (Devine, A., & Yönder, E., 2023). A certain amount of spending on EI can have a positive impact because companies can make their social and environmental activities a competitive strategy against other competitors, so that spending on environmental programs incurred by companies will actually increase company profits which have a positive impact on firm value.

Furthermore, He et al. (2019) verified that the company's objective is to enhance indicators of green economy development by increasing expenditure on environmental pollution management in the form of EI. This statement is in line with legitimacy theory due to the factor that the EI issued by the company is a concrete manifestation of the company's attention to environmental issues (Akhter, F., & Almansour, B, 2023). The company wants to prove that what it has done and its achievements have proven to provide added value to society. The community will indirectly monitor how much the company cares about the environment, because the company's operations are mostly to blame for the environmental effects that happen (Chen and Ma, 2021).

Environmental Investment in Moderating the Influence of Environmental Responsibility on Firm value

Based on the results of research on Energy and Mining companies in ASEAN-5 countries (Indonesia, Malaysia, Singapore, Philippines and Thailand) can be seen in table 3 which shows that the implementation of El carried out by companies cannot strengthen the positive influence of ER on firm value, as evidenced by the significance value of p> 0.10 with a regression coefficient of 0.4490234. The results of this study indicate that this El phenomenon explains that Energy and Mining companies in ASEAN-5 make El information part of transparency to stakeholders (stakeholder theory) and make El an effort to gain legitimacy from the community. Interestingly, there is a possibility that the role of El here is as a greenwashing practice. Particularly when it is known that El increases firm worth but is unable to mitigate the link between ER and firm value.

These results are indicated by the tendency of companies to present environmental information in the form of EI limited to their commitment to environmental preservation without being followed by clarity on the stages that have been taken. In this case, the company shows its performance in disclosing EI only giving a symbolic impression without any textual elements of information that are easily understood by stakeholders (Xue, et al, 2022) also stated that companies communicate environmental motives, actually mainly interested in improving strategy, image, generating publicity, and satisfying their customers without prioritizing environmental responsibility activities to be carried out.

As a result, the true meaning of El in responding to environmental issues is not achieved and does not have an impact as a booster for ER activities. Another fact is that there are still many companies that have not carried out appropriate El activities, especially in the environmental sector, because the form of disclosure presentation is still inconsistent and different in each company. Research from Khalil and Nimmanunta (2023) strengthens this problem, most likely every company in each country does not have a standard for disclosure agreements such as El because environmental regulations are still not strong so that they have the potential to give rise to greenwashing practices. In this case, companies do not make selective disclosures where they may be more exposed to global norms and supervision

Conclusion

The purpose of this study is to investigate how ER affects firm value and to determine how EI functions as a moderating factor in the relationship between ER and firm value for mining and energy businesses in ASEAN-5. The results of the study demonstrate that the ER of mining and energy firms in the ASEAN-5 nations considerably increases firm value. EI also demonstrates the same outcomes. Firm value is significantly enhanced by EI. According to the findings of the subsequent investigation, EI had no moderating effect on the association between firm value and ER.

Companies must actively engage in and continue to develop green practices, incorporate environmental issues into the formulation of corporate strategy through improving environmental performance, such as implementing ER and EI, and enforce regulations requiring them to carry out environmental expenditures. The empirical results of this study have policy implications for governments in each country.

Then, based on the research methodology, this study identified a number of constraints that could be helpful and advantageous for further investigation, such as: Only secondary data was used in this study; more primary data (such as interviews, questionnaires, and observations) could be used in future studies to better reflect the real situation. Corporate governance concerns have not been covered in this study. Corporate governance concerns may be the subject of future study. The number of observations examined in this study is still somewhat little; more research should broaden the industry's scope as an observational sample. Because the EI, ER, and firm value variables were measured throughout the same time period, the study's findings suggest that the EI variable cannot regulate the company's worth. Consequently, future studies should use a time-lag approach to quantify the firm value variable, meaning that EI and ER in year t-1 have an impact on the firm value in year t.

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