

Do Environmental Disclosure and Financial Distress Affect Firm Value? The Moderating Role of Market Capitalization

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Abstract

This study examines environmental disclosure and financial distress among Indonesian Environmentally Sensitive Industries (ESI) firms and their impacts on firm value. To do so, we investigate the potential moderating variable of market capitalization in strengthening the relationship between environmental disclosure, financial distress, and firm value. We measure the environmental disclosure using content analysis with GRI 300 sustainability reporting standards, the environmental dimension, as the benchmark. To measure the financial distress prediction, we utilize the Taffler z-score model and Price to Book Value (PBV) as the proxy of firm value. The research method used in this study was VB-SEM with SmartPLS 3. Using a sample of 59 companies on Indonesian ESI's firm data for the years 2018 – 2020, a period of issuance regarding sustainability reports in Indonesia, our regression results show that most companies have a low level of environmental disclosure. We also find a negative relationship between environmental disclosure and firm value. Moreover, we find that market capitalization can strengthen the relationship between financial distress and firm value. In contrast, we find no association between financial distress and firm value as well as the interaction of market capitalization between environmental disclosure and firm value link.

Keywords

Environmental Disclosure, Financial Distress, Firm Value, Market Capitalization and Sustainability.

1. Introduction

Environmental issues have become a major concern in many developing countries (Gerged et al. 2021), including Indonesia. According to World Air Quality Ranking, Indonesia is classified as the most polluted country in Southeast Asia that mainly caused by business operations of Environmentally Sensitive Industries (ESI) (Kuo and Chen 2013). This polluting business operation may decrease stakeholders' trust and negatively affect their firm value (Sheikh 2018) unless they participate in environmental-related initiatives (Deswanto and Siregar 2018). Hence, it is necessary for Indonesian companies, especially ESI's firm, to have green business operations and disclose their environmental activities and projects to their stakeholders.

Some prior studies on the relationship between environmental disclosure and firm value showed mixed results, either positive relationships (e.g., Li et al. 2018; Qureshi et al. 2020), negative relationships (e.g., Li et al. 2020; Marshall et al. 2009) or insignificant relationships (e.g., Deswanto and Siregar 2018; Hongjun and Xiaobo 2010). According to stakeholder theory, stakeholders are interested in receiving information beyond financial performance (Fuente et al. 2017), such as environmental disclosure. It motivates the company's initiative to address the company's environmental issues. Stakeholders may appreciate these initiatives and generate a good reputation and competitive advantage, such as enhancing stakeholder engagement and loyalty (Rabaya and Saleh 2022), which eventually may enhance firm value. Therefore, the more extensive environmental disclosure, the better the firm value (Li et al. 2018).

A financial distress firm commonly suffers from meeting its obligations. Consequently, they have poor financial performance, as reflected in their financial statements. This issue may negatively affect the stakeholders' trust and harm firm value. From a stakeholder's perspective, a financial distress firm is associated with a poor financial performance which indicates the failure of companies in managing their financial aspects (Jihadi et al. 2021). These conditions may decrease stakeholders' trust over the company, which affects firm value negatively (Widagdo et al. 2020). Thus, financial distress plays a role in affecting the firm value (Andari and Rahyuda 2021; Sumaryati and Tristiari 2018). Signaling theory can be used to justify this relationship. A financial distress firm commonly has poor financial performance, which may give a negative signal to the stakeholders (Safiq and Seles 2019) and deteriorate the firm value (Jihadi et al. 2021). Some previous studies show inconsistent results with positive relationships (e.g., Azhar et al. 2019; Campbell et al. 2008), negative relationships (e.g., Mselmi et al. 2019; Ndicu 2018) or no significant (e.g., Andari and Rahyuda 2021; Sumaryati and Tristiari 2018).

We identify potential reasons for these conflicting results that might arise from incorrect or unreliable proxies for key variables (e.g., Gerged et al. 2021; Harymawan et al. 2021; Li et al. 2018; Sayidah et al. 2020) or the absence of a potential moderating variable affecting the relationship (e.g., Andari and Rahyuda 2021; Garner and Lacina 2019; Harymawan et al. 2021; Mselmi et al. 2019).

Hence, this paper contributes in several ways. First, this study utilizes market capitalization as a potential moderating variable that may affect environmental disclosure, financial distress, and firm value link. To the best of our knowledge, this is the first study that examines whether market capitalization moderates the relationship between environmental disclosure, financial distress, and firm value. According to Kumar and Kumara (2020), market capitalization has an essential role in evaluating firm value since it reflects the company's current and market value (Majanga 2018). This argument is supported by studies from Bhat et al. (2018) and Rashid and Islam (2013) that positive relationships between market capitalization and firm value exist.

Second, some prior research uses Tobin's Q to measure firm value (e.g., Gerged et al. 2021; Li et al. 2018). On the other hand, Price to Book Value (PBV) is expected to perform better than Tobin's Q. According to Miller (1994), PBV is an appropriate proxy to calculate the firm value as it reflects the company's growth conditions and actual situation (Andari and Rahyuda 2021; Jihadi et al. 2021), provides an intuitive measure of firm value, and has the ability to find out whether companies are under or overvalued (Sakina et al. 2021). Hence, this study used PBV to measure firm value.

Third, existing studies examining financial distress in Indonesia mostly use Altman z-score (e.g., Harymawan et al. 2021; Sayidah et al. 2020). Meanwhile, Taffler has a greater forecasting ability to predict financial distress than Altman (Agarwal and Taffler, 2007; Sayari and Mugan 2017). The accuracy of the Taffler z-score is up to 95.7% for predicting financial distress firms, even 100% for non-financial distress firms (Sayari and Mugan 2017). Hence, this study used Taffler z-score as a proxy of financial distress to conduct better results.

The remainder of this article is organized as follows. The next section develops the hypothesis, followed by the research design, information about the sample, and descriptive statistics. The fourth section reports the empirical results. Finally, the last section concludes with recommendations and an explanation of the study's limitations.

1.1 Objectives

This study aims to investigate the impact of environmental disclosure and financial distress on the firm value of Indonesian ESI's firms and whether market capitalization as a moderating variable may strengthen the relationship between environmental disclosure, financial distress, and firm value.

2. Literature Review

2.1 Environmental Disclosure, Market Capitalization, and Firm Value

Stakeholder theory suggests that a company involved in activities beyond profit maximization could meet stakeholders' interests (Fuente et al. 2017), generate a good reputation and competitive advantages (Li et al. 2020), and enhance firm value (Qureshi et al. 2020). Environmental disclosure provides a communication channel for the company to disseminate environmental-related projects implemented in participating to mitigate environmental issues (Porter et al. 2022) and operating the company in a green business way. This may attract green stakeholders, especially non-financial stakeholders such as environmentalists (Girerd-Potin et al. 2014), escalate reputation, and improve

competitive advantage. As a result, it can enhance stakeholders' interests, attract green vendors and green customers, and enhance firm value. That is, the more extensive environmental disclosure, the better the firm value (Li et al. 2018). Some prior studies found a positive relationship between environmental disclosure and firm value (e.g., Gerged et al. 2021; Li et al. 2018; Qureshi et al. 2020). This may still happen when the companies lack attention to environmental activities (Gerged et al. 2021) and belongs to the five most polluting industries category (Clarkson et al. 2013).

Market capitalization can be assumed to strengthen the relationship between environmental disclosure and firm value as it represents the firm size. It is argued that large firm size has a large value of market capitalization. According to Brammer et al. (2006), some firms do not practice environmental activities since it is costly. In addition, large companies have more sources of funds and resources, which enables them to conduct more environmental initiatives. Therefore, these large companies may disclose more extensive environmental information that may create a great competitive advantage and attract stakeholders, eventually improving firm value. This logic is consistent with stakeholder theory. Thus, market capitalization is expected to moderate environmental disclosure and firm value link.

Hence, we posited the hypotheses as follows:

H1: Environmental disclosure positively affects firm value.

H2: Market capitalization moderates the relationship between environmental disclosure and firm value.

2.2 Financial Distress, Market Capitalization, and Firm Value

Signaling theory explains that companies with poor financial conditions may provide negative signals to stakeholders (Safiq and Seles 2019). This negative signal may affect stakeholders' trust negatively over the company (Widagdo et al. 2020) and may decrease firm value (Jihadi et al. 2021). One of the factors that affect firm value is financial distress (Andari and Rahyuda 2021; Sumaryati and Tristiarini 2018), that is the company's condition with financial problems which lead to bankruptcy (Bae 2012). This may affect stakeholders' trust and market value negatively (Widagdo et al. 2020) as they are not attracted to companies with poor financial conditions. Hence, a company needs to predict financial distress. Several measurements predict financial distress, one of which is the Taffler z-score. According to Agarwal and Taffler (2007), firms with a z-score greater than 0 are financially solvent. It indicates that the higher the z-score, the better the financial performance, which may affect the firm value positively. Some prior studies on the relationship between financial distress and firm value show a positive relationship (e.g., Azhar et al. 2019; Campbell et al. 2008). The worse the financial distress level (reflected by a negative Taffler z-score), the worse company's financial conditions (Agarwal and Taffler 2007). This poor financial condition may impair the firm value (Widagdo et al. 2020).

Market capitalization is considered as a potential moderating variable to strengthen the relationship between financial distress and firm value. Market capitalization reflects the size of the firm (Jihadi et al. 2021; Juhandi et al. 2019) and the company's current and market value (Majanga 2018). This indicates that a firm with a large market capitalization shows a high market value and a larger company's size. In addition, large companies tend to have good financial conditions because they have the capability to manage their cash flow and leverage (Kusuma et al. 2021; Lestari and Khafid 2021). Thus, large companies tend to have a low risk of financial distress, attract potential stakeholders and have good market value, which may enhance firm value (Juhandi et al. 2019).

Therefore, we posited the hypotheses as follows:

H3: Financial distress positively impacts firm value.

H4: Market capitalization moderates the relationship between financial distress and firm value.

2.3 Market Capitalization and Firm Value

Signaling theory suggests that companies with large market capitalization indicate a company's size (Kumar and Kumara 2020). Bigger companies rather than smaller, have access to sources of funds to develop their business (Zuhroh 2019). This may give a positive signal to the stakeholder (Safiq and Seles 2019) and market (Jihadi et al. 2021) and improve firm value (Dionne and Ouederni 2011). Market capitalization plays an important role in evaluating firm value (Kumar and Kumara 2020). Market capitalization represents the firm size (Jihadi et al. 2021; Juhandi et al. 2019), the company's market value (Majanga 2018), and the company's future prospects (Kumar and Kumara 2020). That is, large companies have large market capitalization. It is argued that large rather than small companies have lower risk, better control of market conditions, and access to external information. Consequently, it improves the company's market value and encourages better prospects (Kumar and Kumara 2020) in the future, and eventually

enhances firm value (Dionne and Ouederni 2011; Kumar and Kumara 2020). Previous studies from Bhat et al. (2018) and Rashid and Islam (2013) found a positive relationship between market capitalization and firm value.

Thus, the hypothesis is proposed as follows:

H5: Market capitalization positively affects firm value.

3 Method

3.1 Variables

The dependent variable in this study is the firm value measured by Price to Book Value (PBV). We utilize PBV since it provides an intuitive measure of firm value (Sakina et al. 2021), reflects the growth conditions and actual situations (Andari and Rahyuda 2021; Jihadi et al. 2021) as well as the performance of the company (Sakina et al. 2021). Therefore, PBV is an appropriate proxy to determine the firm value (Miller 1994).

We assume environmental disclosure and financial distress as two of the factors that can influence firm value. Environmental disclosure is a set of information provided by a company regarding its environmental activities to address environmental issues (Clarkson et al. 2013; Gerged et al. 2021). To examine the influence of extensiveness of environmental disclosure on firm value, we utilize content analysis with GRI 300 sustainability reporting standards, the environmental dimension, as the benchmark (Gallego-Álvarez et al. 2018). The environmental disclosure index from GRI 300 comprises equally weighted items, and each item is given a score of 1 if the information is disclosed and 0 otherwise. The scoring process disregards the frequency of disclosure of any item. The environmental disclosure is calculated as:

$$Environmental\ Disclosure\ Score_{it} = \frac{\sum ED_{it}}{\sum MSc}$$

Where ED is the total information disclosed; MSc is the maximum score of GRI 300; *i* represents the company and *t* represents time.

Financial distress, as the second independent variable, refers to a condition when companies are unable to meet their obligations for financial difficulties (Bae 2012). We utilize Taffler z-score to measure financial distress. The z-score <0 indicates that the firms are at risk of failure, a z-score equal to 0 means solvency threshold, and a z-score >0 means that they are financially solvent (Agarwal and Taffler 2007). Taffler's model obtains the following z-score model:

$$z = 3.20 + 12.18x_1 + 2.50x_2 - 10.68x_3 + 0.029x_4$$

Market capitalization is considered as the potential moderating variable in this study. Market capitalization represents the combined value of the company or share (Widiatmoko et al. 2020). It is calculated by multiplying the outstanding shares and the market price per share (Kumar and Kumara, 2020). Some control variables are included in this study based on some prior research. Firm size (FSize) (Harymawan et al. 2021; Qureshi et al. 2020) and leverage (LEV) (Qureshi et al. 2020; Sadiq et al. 2020) are included as controls since these variables may affect firm value. Firm size is measured by the natural logarithm of a firm's total assets. Prior studies (e.g., Clarkson et al. 2013; Qureshi et al. 2020) found that firm size is positively related to firm value. A firm with a large size has greater abilities to manage its business and a high commitment to improve its performance (Zuhroh 2019) which may improve firm value. Leverage (LEV) is measured as a debt-to-equity ratio. Companies with high leverage are expected to escalate their business operations (Hussan 2016) since they have better control over debt usage (Zuhroh 2019). This may enhance the company's productivity and performance, which eventually improves stakeholder trust and firm value (Zuhroh 2019). The calculation methodology for the variables is provided in Table 1.

Table 1. The calculation methodology for the variables

Variable	
Firm Value (FV)	Price to Book Value (Price per share/book value per share) (Subramanyam 2013)
Environmental Disclosure (ED)	The environmental disclosure assigns the value of 1 if the companies disclosed the environmental activities and 0 otherwise

Financial Distress (FD)	The financial distress uses the Taffler model where x_1 is the profit before tax/current liabilities; x_2 is the current assets/total liabilities; x_3 is the current liabilities/total assets; and x_4 is the no-credit interval (Agarwal and Taffler 2007)
Market Capitalization (MC)	The natural algorithm of market capitalization (Jia and Li 2020)
Firm Size (FSize)	The natural logarithm of total assets of a firm (Harymawan et al. 2021)
Leverage (LEV)	Debt to Equity Ratio (total liabilities/total equity) (Subramanyam 2013)

3.2 Model Development

The empirical model used to analyze the hypotheses, based on Deswanto and Siregar (2018), Harymawan et al. (2021), Jia and Li (2020), Qureshi et al. (2020), and Zuhroh (2019) as follows:

$$FV_{it} = \beta_0 + \beta_1 ED_{it} + \beta_2 FD_{it} + \beta_3 MC_{it} + \beta_4 ED \times MC_{it} + \beta_5 FD \times MC_{it} + \beta_6 FSize_{it} + \beta_7 LEV_{it} + \varepsilon$$

Where FV is the Firm Value measured by Price to Book Value (PBV); ED represents environmental disclosure, measured by GRI standard's Environmental Dimension and using Dummy 1 for each indicator disclosed and 0 otherwise; FD represents financial distress, measured by Taffler z-score; MC represents market capitalization; $ED \times MC$ represents an interaction term for ED and MC; $FD \times MC$ represents an interaction term for FD and MC; $FSize$ represents firm size measured by the natural logarithm of total assets; LEV represents leverage measured by Debt to Equity Ratio (DER); β represents the coefficient of independent variable; ε represents error term, i represents the company and t represents time.

4. Data Collection

The sample comprises Indonesian-listed firms in Environmentally Sensitive Industries (ESI). These industries are selected since by definition, they are high polluters (Clarkson et al. 2013), and they cause significant environmental damage from their business operations (Kuo and Chen 2013). In addition, these industries are highly influenced by the declining commodity prices since most of them sell commodities, such as gold, gasoline, and natural gas (Arbar 2022; Kembaren 2022). This may negatively affect the profit generated by ESI's firm, which leads to poor financial performance. If this happens continuously, it may enhance the indication of financial distress (Andari and Rahyuda 2021). Cho and Patten (2007) and Garcia et al. (2017) identify pulp and paper, chemical, mining, oil and gas, and metal as ESI's firms. However, to identify ESI's firm in Indonesia, this study utilizes two-digit of Jakarta Stock Industrial Classification (JASICA) codes: 21 (coal mining), 22 (crude petroleum and natural gas production), 23 (metal and mineral mining), 33 (metal and allied products), 34 (chemicals), and 38 (pulp and paper).

The initial sample included 92 companies for 2018 - 2020. These specific years are chosen since in 2017, the Financial Services Authority (OJK) issued a new regulation number 51/POJK.03/2017 regarding the implementation of sustainability finance for financial services institutions, issuers, and public companies. Since then, the number of companies that implement sustainability reports has expanded. The data from Foundation for International Human Rights Reporting Standards (2020) show that sustainability report in Indonesia from 2018 to 2020 is 45, 67, 121, respectively. However, the government delayed the regulation of sustainability report implementation due to the COVID-19 pandemic and mandated it for reporting period of 2021 (Perubahan Peraturan OJK Nomor 14/POJK.05/2020 2020). Furthermore, the impact of the US-China trade war has caused a decline in commodity prices (Iqbal et al. 2020) and economic uncertainty due to the COVID-19 pandemic (Galaś et al. 2021). These phenomena may slow down the business growth and income generated by the company, which may negatively affect the company's financial performance, especially for most companies in ESIs firms, since they sell commodities (Arbar 2022; Kembaren 2022).

This study collected data from sustainability reports and annual reports. We used a purposive sampling technique which requires several criteria to be met by the sample. The sampling criteria adopted were as follows: 1) Environmentally Sensitive Industries Firm listed on the Indonesia Stock Exchange during 2018 - 2020; 2) Publish the annual report; 3) Have a complete financial data. Consequently, we removed samples that did not have the data needed and left 59 unique companies. This study analyzed data for a 3-year period, with the initial observations 177 observation-year. We utilized the Variance Based-Structural Equation Models (VB-SEM) method as the statistical technique analysis. This method considered as the most suitable method for this study due to following reasons. First,

this study considered to have a small sample size (with the final sample of 59) and VB-SEM may require a small sample size which is less than 100 and with a minimum of 30 (Jaya et al. 2019). Second, this study aims to predict whether market capitalization may strengthen the environmental disclosure, financial distress, and firm value link as well as investigating the impact of environmental disclosure and financial distress on the firm value of Indonesian ESI's firms. Therefore, this study is classified as a predictive research and VB-SEM is a prediction oriented approach to SEM (Jaya et al. 2019). Furthermore, we used SmartPLS 3 as the statistical software to run the data.

5. Results and Discussion

5.1 Descriptive Statistics

Table 2 reports the descriptive statistics of our dependent, independent, moderating, and control variables for the complete dataset of 177 observation-year. The mean full sample of firm value (FV) is 1,5681 and it ranges from 0,1523 to 7,5485. This result shows a large variation of firm value on ESI's firm. The environmental disclosure level (ED) is considered low with a score of 32,12%, which is less than 50%. This low score of ED level indicates that most of ESI's firms lack attention to inform their environmental activities in order to mitigate environmental issues. This may be due to a different guideline utilized by companies in Indonesia to disclose their environmental activities since Indonesia still has no certain guidelines for companies to report their environmental activities. In addition, the sustainability report was a voluntary report until 2021 in Indonesia and became mandatory afterward. For this reason, companies in Indonesia may prefer not to publish their environmental disclosure, or even if they publish their sustainability report, the information disclosed may be limited.

The firm size (FSize) measured by total asset shows an average of Rp 16,33 trillion. According to Undang-Undang Republik Indonesia Nomor 20 Tahun 2008 (2008), a firm in Indonesia is classified as a large firm if the total asset is greater than Rp 10 billion. Therefore, most of ESI's firms are considered to have a large size which reveals that they have more sources of funds and resources as well as a great ability to manage their assets over the three-year sample. The market capitalization (MC) shows an average of Rp 13,31 trillion, which is considered the majority of ESI's firms have a large market capitalization since Indonesian Stock Exchange classified firms have a large MC if it is above Rp 10 trillion (Nurhaliza 2022). This large MC also indicates that most ESI's firms have a good market value.

About the financial condition, it can be seen from the leverage (LEV) and financial distress score (FD). The average value of LEV is 1,36 times which is considered high leverage since it is greater than 1 and ESI's firms tend to utilize debt to maximize their business operations. However, this score is still tolerable as the Indonesian government allows the highest DER is 4 times (Peraturan Menteri Keuangan Republik Indonesia Nomor 169/PMK.010/2015 2015). Finally, most ESI's firms do not have financial distress issues, as reflected on their average z-score, which is 12,2. This score is higher than 0, revealing that they are financially solvent.

Table 2. Descriptive statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
FV	177	1,5681	1,5337	0,1523	7,5485
ED (percent)	177	32,12	15,12	6,25	71,88
FD	177	12,2468	18,6605	-92,1713	92,7556
MC (Million Rupiah)	177	13.312.720	27.349.083	40.320	185.022.773
FSize (Million Rupiah)	177	16.326.567	26.915.556	134.905	124.733.952
LEV	177	1,3595	1,3965	0,0941	8,4400

5.2 Validity and Reliability Test

Table 3 provides construct reliability and discriminant validity. Construct reliability is tested to measure the internal consistency. The result shows that the overall constructs are reliable as the composite reliability scores were greater than 0,70 (Pittino et al. 2018). Finally, we examine the discriminant validity using the Fornell-Larcker criterion. In terms of the Fornell-Larcker criterion, the square root Average Variance Extracted (AVE) should have a greater value than the correlation (Garson 2016). The analyses show that our construct has been fully satisfied.

Table 3. Composite reliability and discriminant validity

	Composite Reliability	ED	ED*MC	FD	FD*MC	FSize	FV	LEV	MC
ED	1.000	1.000							
ED*MC	1.000	0,275	1.000						
FD	1.000	0,093	0,068	1.000					
FD*MC	1.000	0,080	0,205	-0,177	1.000				
FSize	1.000	0,589	0,151	0,020	0,107	1.000			
FV	1.000	0,172	0,045	0,049	0,119	0,117	1.000		
LEV	1.000	0,129	-0,057	-0,238	0,101	0,190	-0,043	1.000	
MC	1.000	0,589	0,162	0,091	0,080	0,876	0,484	-0,063	1.000

5.3 Hypothesis Test Result

Table 4 presents the results of the hypothesis test. The coefficient of ED is negative and significant ($H1: \beta = -0,092, p < 0,05$), meaning that the more extensive the environmental disclosure reported by ESI's firm, the lower the firm value. This statistical result is inconsistent with the H1 that environmental disclosure positively affects firm value; therefore, H1 is rejected. According to Brammer et al. (2006), it is costly to disseminate environmental activities. Therefore, the more extensive environmental activities implemented by the company, the costlier it will be. This may reduce the profit gained by the company (Song et al. 2017), which may decrease the stakeholders' wealth (Barnea and Rubin 2012). Consequently, the company may not be able to meet the stakeholders' interests and decrease their trust over the company, especially those with profit-oriented such as financial stakeholders (Deswanto and Siregar 2018; Girerd-Potin et al. 2014), which may deteriorate the firm value (Barnea and Rubin, 2012; Deswanto and Siregar 2018). This finding is consistent with prior studies that find the firm value will be lower by the more extensive the environmental disclosure (Li et al. 2020; Marshall et al. 2009). However, from a theoretical perspective, this finding is not consistent with stakeholder theory that posits as companies with high involvement in activities beyond profit maximization may be appreciated by stakeholders and able to meet their interests beyond financial performance (Fuente et al. 2017) which may enhance firm value (Qureshi et al. 2020). The result may indicate that most of Indonesian ESI's firm stakeholders are financial stakeholders. This type of stakeholder tends to be reluctant to support the environmental projects as it may decrease the company's profit and stakeholder's wealth (Barnea and Rubin 2012).

The coefficient of ED interacted with MC also shows negative but insignificant ($H2: \beta = -0,004, p > 0,05$), meaning that MC does not moderate the impact of ED on FV; hence, H2 is rejected. This could be happened because the majority of Indonesian ESI's firm stakeholders are financial stakeholders. This type of stakeholder is profit-oriented, which is more concerned with financial information and their assessment towards the firm value is not affected by the environmental disclosure (Deswanto and Siregar 2018). For this reason, companies with a large number of financial stakeholders prefer to maximize their business operation in order to generate better profit and satisfy the financial stakeholders. In addition, as most of ESI's firms have a large MC and companies with large MC tend to have better sources of funds (Zuhroh 2019), they may prefer to allocate their funds for business operation maximization rather than implementing environmental projects and disseminating environmental information to financial stakeholders' interests. This result is not consistent with stakeholder theory which suggests stakeholders' interests may be met by disclosing information related to the company's environmental activities (Fuente et al. 2017).

The association between Financial Distress (FD) and Firm Value (FV) is positive but insignificant ($H3: \beta = 0,024, p > 0,05$), explaining that the financial distress score obtained by Indonesian ESI's firms does not have a significant impact on the value of ESI's firms. This result potentially indicates that financial distress level (reflected by Taffler z-score) is only a model to predict financial distress indication; hence, H3 is rejected. However, the stakeholder may need further analysis, such as monitoring the financial statement (Fitriani et al. 2021) and the company's capability in controlling its debt usage (Zuhroh 2019) in order to classify a firm in financial distress condition (Fitriani et al. 2021). Thus, a financial distress score may not provide a company's current financial conditions and the firm value is not affected. This result is consistent with Andari and Rahyuda (2021) and Sumaryati and Trisriarini (2018), that found there is no association between FD and FV. However, this relationship is not consistent with the signaling theory that financial distress score may not fully captured information related to a company's financial condition. For this reason, the stakeholder may not receive any positive or negative signal provided by the company and the assessment towards the company is not affected (Safiq and Seles 2019).

The interaction coefficient of Financial Distress (FD) and Market Capitalization (MC) shows positive and significant relationship (H4: $\beta = 0,128, p < 0,05$). This explains that MC positively moderates the relationship between FD and FV; hence, H4 is accepted. This aspect may be due to companies with large MC reflect large companies (Jihadi et al. 2021; Juhandi et al. 2019) tend to have a good market value (Majanga 2018). As the majority of ESI's firms have a large MC (refer to Table 2), this reflects that they have good market value and are big companies. According to Lestari and Khafid (2021) and Kusuma et al. (2021), big companies are more likely to have good financial conditions since they tend to have great capability to manage their cash flow and leverage, so they have a low risk of financial distress. Based on the Taffler model that predicts the financial distress indication, companies are not at risk of failure when they have a positive z-score (Agarwal and Taffler 2007). This indicates that the bigger the z-score (reflected by a positive z-score), the better the financial condition, which may enhance FV (Juhandi et al. 2019). Therefore, large MC may encourage companies to have good financial conditions or lower the risk of financial distress (reflected by a positive z-score). This good financial condition may provide a positive signal to stakeholders (Safiq and Seles 2019) and enhance stakeholders' trust over the company, which may enhance firm value (Widagdo et al. 2020). From a theoretical perspective, it is consistent with signaling theory since it suggests well-performed companies may provide positive signals to stakeholders (Safiq and Seles 2019).

Market capitalization (MC) is positive and statistically significant with Firm Value (FV) (H5: $\beta = 2,098, p < 0,05$), meaning the larger the MC, the better the FV. This result provides evidence that most of Indonesian ESI's firms have large MC; thus, H5 is accepted. Companies with large market capitalization tend to have better access to external information (Juhandi et al. 2019) and access to sources of funds to develop their business (Zuhroh 2019). In addition, companies with large market capitalization, such as ESI's firms have higher brand recognition and tend to sell particular goods or services (e.g., gasoline, coal, and crude oil) (Gong et al. 2021; Seredkin et al. 2016) that other companies may not produce. Consequently, they may have the capability to compete with their competitors and dominate the market, which encourages them to have better control over the market condition (Juhandi et al. 2019). Thus, this large market capitalization may provide a positive signal to the stakeholder (Safiq and Seles 2019) and the market (Jihadi et al. 2021), which eventually enhances firm value (Dionne and Ouederni 2011; Kumar and Kumara 2020). This result is consistent with signaling theory and prior studies such as Bhat et al. (2018) and Rashid and Islam (2013) that find a positive relationship between MC and FV.

Both of our control variables are significant, namely firm size (FSize) and leverage (LEV). Firm size (FSize) is significantly and negatively associated with FV ($\beta = -1,760, p < 0,05$), meaning the larger the company size, the lower the firm value. This result is consistent with Maury and Pajuste (2005) and Wijayaningsih and Yulianto (2021). Large companies are considered as mature firms (Maury and Pajuste 2005) that tend to have lower growth opportunities (Wijayaningsih and Yulianto 2021). Consequently, this may decrease the firm value (Maury and Pajuste 2005) since stakeholders are not attracted to companies with less growth opportunities. In contrast, leverage (LEV) is significantly and positively associated with FV ($\beta = 0,430, p < 0,05$). This result is consistent with Siagian et al. (2013) and Zuhroh (2019). Companies with high leverage may have better control over their debt usage (Zuhroh 2019). This may improve the company's productivity (Zuhroh 2019) in maximizing its business operation (Hussan 2016). As a result, it enables them to enhance their performance which eventually enhances firm value (Zuhroh 2019).

Table 4. Hypothesis test

FV (N=177 obs-year)	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
ED	-0,092	-0,091	0,044	2,063	0,039
ED*MC	-0,004	-0,002	0,045	0,084	0,933
FD	0,024	0,018	0,040	0,585	0,559
FD*MC	0,128	0,134	0,054	2,359	0,018
FSize	-1.760	-1,773	0,133	13,198	0,000
LEV	0,430	0,433	0,040	10,857	0,000
MC	2,098	2,107	0,118	17,817	0,000

6. Conclusion

Indonesian ESI's firm may enhance firm value by disclosing information related to their environmental projects and predicting financial distress. In addition, this study investigates potential moderating variables on the environmental disclosure, financial distress, and firm value link of Indonesian ESI's firm. Our findings provide insight for stakeholders and companies with useful information about the impact of the environmental disclosure level of ESI's firm on the firm value.

Based on empirical results, a negative relationship between environmental disclosure and firm value is found. Indonesian ESI's firm value is negatively affected by the environmental disclosure since most of its stakeholders are financial stakeholders which are not attracted to environmental disclosure. Consequently, Indonesian ESI's firms tend to disclose limited information regarding environmental disclosure. Hence, this finding provides an implication for financial stakeholders to be more considerate of the company's financial aspect rather than any other aspects such as the environmental projects while making an investment decision. As for the companies, this finding is useful as a consideration in disseminating an environmental project that may not deteriorate the stakeholder's wealth.

This study utilizes the Taffler model as it is expected to have greater forecasting ability in predicting financial distress (Agarwal and Taffler 2007; Sayari and Mugan 2017). An insignificant association between financial distress and firm value is found; an outcome is consistent with stakeholders that tend to not fully rely on the prediction model to analyze a distressed condition of a firm. They need further analysis, such as monitoring the financial statement (Fitriani et al. 2021) and the company's capability in controlling its debt usage (Zuhroh 2019) to observe the firm's current condition and assess the firm value. Thus, the implication of this finding is suitable for stakeholders in analyzing the company's financial distress indication by conducting a further analysis apart from the Taffler model.

Further, this study's approach of taking market capitalization as the potential moderating variable for environmental disclosure, financial distress, and firm value relationship. We found that market capitalization is able to strengthen the relationship between financial distress and firm value. This may be because companies with large market capitalization, such as Indonesian ESI's firms tend to have good financial conditions (Kusuma et al. 2021; Lestari and Khafid 2021) and reflect good current and market value (Kumar and Kumara 2020). This large market capitalization may provide a positive z-score (indicating they are financially solvent) which may encourage firm value enhancement. Therefore, this finding has an important implication for Indonesian ESI's firms as they have large market capitalization and their majority stakeholders are financial stakeholders, they have to be attentive on their market capitalization.

In contrast, we discover that market capitalization does not moderate the relationship between environmental disclosure and firm value. Perhaps because this study finds most of ESI's firms have large market capitalization, which indicates they have better sources of funds. It encourages them to maximize their business operations instead of disseminating environmental projects since the majority of Indonesian ESI's firms' stakeholders are financial stakeholders. In addition, this type of stakeholder is not affected by environmental projects' extensiveness in assessing the value of the firm (Deswanto and Siregar 2018). Hence, this finding brings implication for companies with a large number of financial stakeholders, such as Indonesian ESI's firms to consider allocating their funds on business operations maximization in order to generate better profit in the future and meet their stakeholders' interests.

This study has acknowledged a limitation that could be addressed in future research as our study examines the company's environmental disclosure from the company's annual report and sustainability report only, this may not fully cover environmental information provided on other sources such as firm websites, which may influence the quality of environmental disclosure. Future research could obtain the environmental disclosure data from external rating agencies (e.g., Bloomberg, Sustainalytics, Thomas Reuters, MSCI) as they utilize a comprehensive methodology, even retrieve information directly from the companies to create score (Huber et al. 2022; Li et al. 2018). Hence, it is expected that these rating agencies are accountable and able to minimize bias.

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