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RESEARCH PAPER

Are State-Owned Enterprises doing better? An empirical study on climate change mitigation efforts reported by Indonesian companies

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Abstract. Indonesia is a country with high Greenhouse Gas (GHG) emission, contributing significantly to climate change problems. As part of its commitment to address this, the Indonesian government, through State-Owned Enterprises (SOEs), is dedicated to mitigating climate change. Early reporting on this mitigation efforts is crucial in addressing this pressing issue. This study aims to examine how company ownership and other companies' characteristics (such as sector type, size, and profitability) influence the disclosure of climate change mitigation efforts. Content analysis is conducted on the annual and sustainability reports of top-100 Indonesian companies, based on their financial performance in 2020. Among the 100 observations, only 13 companies were categorized as have comprehensive reporting. In addition, using the General Ordered Logit Model (GOLM) regression, this study reveals that SOEs do not demonstrate superior disclosure compared to private companies. Instead, industry type and company size notably influence the climate change mitigation efforts, while the company's profitability shows no significant impact on reporting. Therefore, improving disclosure require stricter regulatory enforcement, especially for SOEs and private companies, business in the low-emissions sectors, and those with limited asset levels.

Keywords: State-owned enterprises; Climate change mitigation; Climate change reporting; General Ordered Logit Model

1. Introduction

The increase in greenhouse gas (GHG) emissions significantly contributes to climate change, adversely impacting company performance. Climate change leads to declined worker productivity due to increased stress from rising temperatures (Lee et al., 2018). Furthermore, it induces extreme weather conditions that cause physical damages, disrupting company operations and distribution, consequently increasing operational costs (Nikolaou et al., 2015). As a result, the company faces reduced and uncertain income streams (Huang et al., 2018). This adverse impact is evident through several natural disasters that have disrupted productivity across Asia, Europe, and America (Leslie, 2022). Therefore, companies need to implement measures to mitigate the risks and impacts posed by climate change, thus improving their performance once more.

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As an early stage in the mitigation climate impact, it is imperative to report on the company's GHG emissions. This reporting fosters increased awareness among companies regarding the risks associated with climate change, as well as the potential for energy conservation and emission reductions (Kauffmann et al., 2012). Numerous studies analyzed corporate GHG reporting and the influencing factors. Factors such as company size (Chithambo, 2013; Chithambo & Tauringana, 2014), industry type in terms of emissions intensity (Ieng Chu et al., 2013), and profitability (Akbaş & Canikli, 2019) have been identifies as positively influencing GHS disclosure by companies. Zhang and Liu (2020) declare that the previous studies have established a consensus regarding the significant of these factors in the disclosure of GHG emission by companies.

However, there is a factor that applies a non-consensus effect on the GHG reporting, – specifically, the type of company ownership. Acar et al. (2021) propose that the ownership type significantly distinguishes a company's behavior from others. Government-owned companies are expected to exhibit a higher level of social responsibility and contribute more to implementation of sustainable development, including emissions reduction (Faisal et al., 2018; Kumar, 2022). Empirical evidence, such as the presented by Giannarakis et al. (2018), support this, revealing a positive effect between government ownership and climate change disclosure. He et al. (2019) further affirm that State-Owned Enterprises (SOEs) disclose more carbon information. These findings collectively suggest that the GHG reporting tends to be more comprehensive when companies are owned by the government.

On the other hand, private companies also need to disclose their emissions information. This necessity arises due to various factors such as pressure from stakeholders and consumers, increase energy cost, and government regulation aimed at reducing emissions (Gouldson & Sullivan, 2013). Some previous studies have not identified a significant difference in the quality of GHG reporting between companies with different ownership types (Halkos & Skouloudis, 2016; Kumar, 2022; Peng et al., 2015). However, Ieng Chu et al. (2013) found that private companies tend to disclose more GHG information than SOEs. These diverse empirical results show that there is no universal consensus about the effect of ownership type on a company's GHG disclosure.

Despite ongoing debates within the literature, the ownership type of companies remains important in the GHG disclosure practice, especially in developing countries. This is largely due to the absence of mandatory disclosure regulations for companies in most developing countries (Acar et al., 2021). SOEs, being government-owned entities, can serve as models and set a standard for other organizations, such as private companies, to implement responsible policies for society (Argento et al., 2019), including the disclosure of GHG information. The important of SOEs in this issue is evident in Indonesia. As one of the leading contributors to global GHG emissions (Friedrich et al., 2020), Indonesia has committed to participating in climate change mitigation efforts, which is involves various stakeholders, including SOEs. Given the major role that Indonesian SOEs play in in the national economy, their participation in emissions reduction is mandated (Kominfo, 2016; Saeed & Thohir, 2022). Consequently, Indonesian SOEs are expected to play a significant role addressing climate change issues, particularly in GHG reporting.

Previous studies conducted in Indonesia by Hermawan et al. (2018) and Faisal et al. (2018) demonstrated that SOEs disclose a greater extent of emissions information compared to private companies. However, these studies do not definitely establish whether the disclosure signifies superior performance of SOEs in addressing climate change issues compared to private entities. Addressing this gap, the current study aims to fill this gap by focusing on companies' reporting of climate change mitigation efforts, considering this disclosure as a relevant proxy to describe the companies' commitment towards climate change issues (Halkos & Skouloudis, 2016). Additionally, this study attempts to investigate the implications of ownership type and others companies' specific characteristics on the disclosure of climate change mitigation efforts. Therefore, this study offers several notable contributions. Firstly, it attempts to enrich the literature by offering more detailed analysis of GHG disclosure specifically pertaining to climate

change mitigation efforts. Meanwhile, investigating companies' decisions and actions aimed at mitigating climate change impacts will foster a comprehensive understanding essential for tackling these issues (Gulluscio et al., 2022). Secondly, given the important roles of SOEs and the Indonesian government's commitment to addressing climate change, this study identified how ownership type and other company characteristics affect their reporting on mitigation efforts. Hence, the study offers insights into the current status of these commitments. Thirdly, the findings of this study aim to provide recommendations aimed at improving the quality of reporting on the mitigation of climate change by the Indonesian companies.

2. Literature review

2.1. Theoretical framework

Climate change mitigation efforts reporting forms an integral part of a company's environmental disclosure. According to Halkos and Skouloudis (2016), a companies' environmental disclosure practices are primarily associated with the legitimacy theory. This theory suggests that during their operational activities, companies establish a social contract through a reciprocal interaction with society (Ieng Chu et al., 2013; Nurhayati et al., 2016). Under this contract, society provides essential resources - human or natural - to companies that operate within social provisions (Bae Choi et al., 2013). At the same time, to gain or maintain their legitimacy, company undertake "right things" activities aimed at improving societal welfare. These activities includes consequential actions (i.e. resource donations for reforestation), procedural measures (e.g., adoption of eco-friendly technology), and structural initiatives (e.g. support for charitable organizations) (Mahadeo et al., 2011). Conversely, engaging in activities detrimental to societal welfare, including environmental quality, could prompt society to terminate the contract. This align with the global significance of the climate change discourse, exerting considerable pressure on company worldwide (Akbaş & Canikli, 2019; Bhasin et al., 2015). Therefore, from the perspective of legitimacy theory, companies disclose their environmental aspects to meet public expectations and secure continues legitimacy in their operations.

The environmental disclosure practices of a company are significantly determined by its stakeholders. The stakeholder theory explains that companies face pressure from certain stakeholders to operate sustainably (Akbaş & Canikli, 2019). These stakeholders refer to external individuals or groups, including investors, shareholders, public interest groups, and governmental bodies (Liesen et al., 2015). The stakeholder theory emphasizes that the environmental disclosure is imperative for companies to meet stakeholder's demand for climate change-related information (Hahn et al., 2015). This is relevant in the current condition, given the escalating concern for sustainability among investors over recent years (Cort & Esty, 2020). As a result, company's valuation is no longer solely dependent on financial metrics but also on non-financial factors, such as environmental, social, and governance (ESG) elements (Cho, 2022). Therefore, companies are expected to conscientiously operate to reduce and mitigate their harmful impact on the environment and social domains (Kiernan, 2007). In addition, disclosing environmental impacts profoundly affect perceptions regarding the business sustainability of the company (Chithambo & Tauringana, 2014). Through this disclosure, companies can improve their impression by demonstrating their involvement in combating climate change.

Another theory contributing to understanding companies disclosure of environmental impact is the institutional theory, Which operates as a branch of legitimacy theory focusing on organizational behavior under institutional pressures (Faisal et al., 2018).. These pressures manifest in regulative, normative, and cognitive structures, shaping rules, policies, patterns, and programs through various agents like governments, experts, industries, the public, and courts (de Grosbois & Fennell, 2022). Companies must align with prevailing policies, mechanisms, and structures to meet this requirement (Akbaş & Canikli, 2019). In addition, the institutional theory emphasizes that companies facing similar pressures tend to convergence (Datt et al., 2022). Tang and Luo (2016) suggest that companies within the same sectors often adopt similar action to

conform with institutional demands. These companies competing in the same market encountering comparable risks and regulations. As a result, to navigate shared conditions, companies mimic strategies recognized as the successful models by their peers (Escobar & Vredenburg, 2011; Luo & Tang, 2016). Grob and Benn (2014) explain that companies under comparable environmental pressures are forced to resemble similar strategies to establish and sustain their legitimacy while ensuring survival. Ring climate change issues, companies face substantial pressure from multiple institutions and encounter a legitimacy gap to reduce their environmental damages (Hermawan et al., 2018). Hence, companies respond to these pressures and the gaps by improving their performance related to climate change issues, such as disclosing their climate change mitigation efforts.

2.2. Hypotheses development

Building upon the theoretical framework, this study focuses on developing hypotheses aimed to explaining the relationship between climate change mitigation effort and the explanatory variables. The development of these hypotheses, including the variables and their anticipated relationship, is illustrated in the research framework (Figure 1) and justified in the following section.

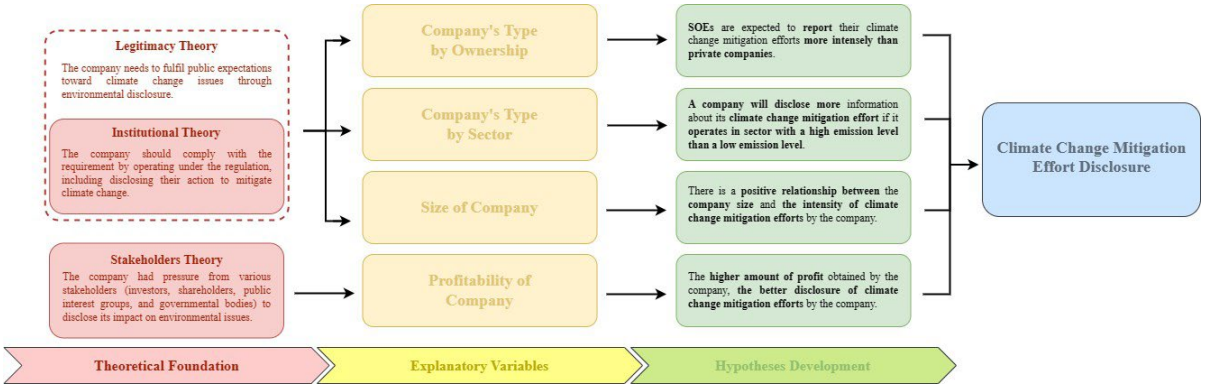

Figure 1. Research framework

2.2.1. Ownership

Company ownership can significantly influence a company's disclosure of climate change mitigation efforts disclosure. SOEs face increase expectations to fulfill social and political commitments compared to private companies (Ieng Chu et al., 2013). Acar et al. (2021) argue that management within government-owned companies demonstrated a greater propensity to disclose information, show their social and environmental responsibilities. In the Indonesia context, the government has announced commitments to carbon reduction and climate resilience through National Determined Contribution (NDC) and Long-Term Strategy for Low Carbon and Climate Resilience 2050 (LTS-LCCR 2050). Both NDC and LTS-LCCR 2050 serve as an important foundation formulating climate change regulations in Indonesia. Subsequently, policies such as President Regulation Number 61/2011 which outlines the national action plan on GHG emissions reduction (RAN-GRK), and national action plan on Climate Change Adaptation (RAN-API) formulated by the Ministry of National Development Planning of Indonesia, specifically address climate change concerns. These regulations encourage the government to urge SOEs to undertake their responsibility for regarding environmental issues (Shen et al., 2020), which includes disclosing climate change-related information. As a result, in this study SOEs are expected to demonstrate a more pronounced intensity in reporting their climate change mitigation efforts compared to private companies.

2.2.2. Type of sector

Companies operating in sectors characterized by high levels of greenhouse gas emissions – such as energy, manufacturing, and transportation - are subjected to public scrutiny and improved expectations to reduce their emission levels (Ieng Chu et al., 2013). Stakeholders including government, investors, and society at large pressure on companies in these sectors to disclose more information regarding emission reduction, unlike companies in sectors with relatively lower emissions (Chithambo & Tauringana, 2014; Faisal et al., 2018). Therefore, in this study, the type of sector is expected to exhibit a positive correlation with the reporting of climate change efforts. It is expected that companies operating in sectors with high emission levels will provide more comprehensive information about their climate change mitigation efforts in their report compared to those operating in sectors with lower emission level.

2.2.3. Firms size

Large corporations tend to attract greater public attention and visibility (Faisal et al., 2018). Enhanced visibility urges companies to address public pressure by providing more comprehensive information related their environmental impact (Ieng Chu et al., 2013). Furthermore, effective engagement in climate mitigation demands substantial financial and technical resources to alter operational methods, a capacity more ready available to larger companies (Chithambo & Tauringana, 2014). This can be assumed that larger companies tend to disclose more information related to their efforts in climate change mitigation compared to smaller companies.

2.2.4. Profitability

A company demonstrating high profitability and disclosing information about its GHG emissions signifies its proactive approach in addressing the existing environmental issues (Bae Choi et al., 2013). Moreover, the profits gained by the company can be allocated toward covering the expenses associated with disclosure and decarbonization initiatives (Brammer & Pavelin, 2008; Faisal et al., 2018). Thus, the greater the company profitability, the more robust its disclosure regarding climate change mitigation efforts.

3. Methodology

3.1. Methods

3.1.1. Quantifying GHG reporting

Previous studies have used content analysis in several approaches to quantify the company's environmental impact outlined in their annual or sustainability reports. Ieng Chu et al. (2013) and Momin et al. (2017) assessed the reporting of company's GHG emissions by analyzing the number of words and sentences related to greenhouse gas emissions across the company's annual reports, corporate sustainability reports, and websites. Meanwhile, Chithambo (2013), Chithambo and Tauringana (2014), and Faisal et al. (2018) evaluated the quality of GHG emissions reporting using an unweighted index based on certain categories outlined by Bae Choi et al. (2013), such as climate change risks and opportunities (CC), GHS emissions accounting, energy consumption accounting (EC), GHS reduction (RC), and cost and carbon emission accountability (ACC). Additionally, Comyns (2016) combined these aforementioned methods to assess a company's reporting on GHG emissions. In this study, the focus in on disclosing a company's mitigation efforts concerning climate change, with the quality of reports evaluated based on these efforts, as conducted by Halkos and Skouloudis (2016). This method involves ranking companies based on the comprehensiveness of their reports on the climate change mitigation efforts, replicated in Table 1.

In this study, the company's report will be assessed based on the extent of disclosure regarding climate change mitigation efforts using the scoring mechanism outlined in Table 1. Company that does not provide any disclose of their mitigation efforts will receive a score of 0. A

score of 1 will be assigned to company reports that partially disclose climate change mitigation efforts. Meanwhile, companies offering comprehensive explanations of their climate mitigation activities will be awarded a score of 2, representing the highest achievable score.

Table 1. GHG emission report score based on disclosure of mitigation efforts (Halkos & Skouloudis, 2016), pr ocessed by Authors

Score	Qualification	Description
0	No Disclosure	The company does not provide information related to climate change mitigation.
1	Incomplete Mitigation Plans	The Company reports mitigation efforts with gaps, without specifics strategies and targets. Also, the efforts were not correlated with the operational of the company.
2	Complete Mitigation Plans, including the indicator of plans and long-term strategies	The company reports mitigation efforts in detail, including program plans and strategies, and the targets to be achieved. The efforts also directly connected to the company's operational process.

3.1.2. Econometrics modelling

The primary model utilized to analyze the company's GHG reporting in this study is ordered logit regression. This choice is attributed to ordinal nature of the GHG emission reporting, serving as the dependent variable (Harrell, 2015). When the dependent variable is an ordinal, ordered logit regression is the most appropriate analytical method. As pointed out by McKelvey and Zavoina (1975), applying Ordinary Least Square (OLS) regression with an ordinal variable can lead to parameter bias and inaccurate statistical significance. On the other hand, utilizing alternative methods such as multinomial logit regression proves inefficient. Multinomial logit regression ignores the ordered categories, tends to difficulties in interpreting regression outcomes as it fails to capture essential information from ordering categories (Williams, 2016). In contrast, ordered logit regression addresses these issues by appropriately treating ordinal variables and leveraging information from the ordered categories. In this study, the GHG emissions reporting variable (Y_i) features three ordered categories, 0 (no reporting), 1 (incomplete reporting), and 2 (complete reporting). Subsequently, based on the developed hypotheses, this variable will be examined using explanatory variables. Thus, aligning with research by Halkos and Skouloudis (2016), the ordered logit regression equation in this study can be denoted as follows.

$$Logit[PrY_i < j] = \alpha_j - \sum_{n=1}^{K} \beta_n X_{in} \quad (1)$$

Where, j represents the order of Y_i, and α_j denotes the threshold parameter that separates the borderlines of each order. The estimation of the ordered logit regression model will generate both the constant value and the coefficient value indicating the relationship between the dependent variable and the explanatory variable.

Meanwhile, the ordered logit model is required to fulfil the parallel lines assumption, necessitating that the estimated coefficient remain consistent across different models. In instances where these assumptions are not met, this study applies the generalized ordered logit model (GOLM). This model offers relaxation of assumptions inherent in the ordered logit model, facilitating more interpretable estimates (Williams, 2016). Within this model, variable coefficients may vary across categories of the dependent variable. When this condition does not apply to every

variable, the model is termed as partially constrained (Michalaki et al., 2015). As outlined by Williams (2006), the expression for GOLM is as follows:

$$P(y_i>j)=g(x\beta_j)=\frac{\exp(\alpha_j+x_i\beta_j)}{1+\{\exp(\alpha_j+x_i\beta_j)\}},\quad j=1,2,\ldots,M-1 \tag{2}$$

where M represents the number of categories of the ordinal dependent variable, the partially constrained model can be written as follow:

$$P(y_i>j)=g(x\beta_j)=\frac{exp\,(\alpha_j+x_{1i}\beta_j+x_{2i}\beta_2)}{1+\{exp(\alpha_j+x\beta_j x_{2i}\beta_2)\}},\qquad j=1,2,\ldots,M-1 \tag{3}$$

In Equation 3, the first subset of variables featuring a non-constrained coefficient across the values, while the second subset maintains the same coefficient across the various values of j (Michalaki et al., 2015). In a GOLM with three values for the ordinal dependent variable, there are typically two panels of coefficients. The first panel contrast category 1 with categories 2 and 3, while the second panel contrasts categories 1 and 2 with category 3. A positive coefficient value resulting from estimation indicates that the higher value of the independent variable corresponds to a higher-order observed sample on the dependent variable.

3.2. Data

This study focuses on the 100 largest companies in Indonesia, determined by their financial performance in 2020 (Fortune Indonesia, 2021). Data for this research were obtained from the company's annual and sustainability reports of the same year. To assess the operational sector of each company based on GHG emissions intensity, reference was made to the Climate Transparency report (Wheelwright, 2020). This report identified industry, energy, and transportation as the sectors making the most significant contributions to GHG emissions in Indonesia. The distribution of companies across sectors in this study is illustrated in Figure 2. Company size is measured by the logarithm of total assets, following the methodology of by Faisal et al. (2018). Subsequently, the type of company ownership is represented as a dummy variable, where the government-owned companies are denoted by 1 and private companies by 0.

4. Results and discussions

Table 2 depicts the categorized company data using descriptive statistics. It reveals a considerable variation in asset † and profits, likely to attributable to the differing financial performances among companies emerging from the beginning pandemic in Q1 2020. Among the 100 largest companies in Indonesia, Table 2 indicates that only 13 companies have provided complete disclosure, 55 companies operate in sectors with high emissions intensity, and 24 companies are government-owned. Moreover, Figure 2 demonstrates that among SOEs, (54.2%) exhibit incomplete or partially disclose mitigation plans, followed by no disclosure (33,3%) and complete disclosure (12.5%). On the other hand, non-SOEs predominantly (57.9%) refrain from disclosing their climate change mitigation efforts, with 28.9% making partial disclosure, and 13.2% complete disclosing. Meanwhile, within the high-emissions intensity sector, the majority of companies (47.3%) refrain from disclosure, followed by partial disclosure (30.9%), and fully disclosure (21.8%). Similar trends are observed in the low-emissions intensity sector, where 57.8% lack disclosure, 40% offer partially disclosure, and only 2.2% provide complete disclosure. These findings highlight a limited number of Indonesian largest companies within the sample exhibiting awareness in disclosing their efforts to mitigate climate change. However, the

† In the following sections, the current study transforms asset value into a natural logarithm form as the proxy of company size. Through this step, the variation of company size values will be relatively narrowed and normally distributed (Nurhayati et al., 2016).

descriptive statistics do not conclusively determine the variables influencing companies' climate change mitigation disclosure. Hence, further analysis is necessary to reveal how these variables are influenced by explanatory variables.

Table 2. Descriptive statistics of observed companies

Continuous Variables					
Variables	N	Mean	Standard Deviation	Min	Max
Asset	100	135061.7	298683.1	3361.96	1589060
Profitability	100	2079.03	5107.72	-8891.1	27131.11
Categorical Variables					
Variables				N	
Disclosure qualification					
0: No disclosure				52	
1: Partial disclosure				35	
2: Complete disclosure				13	
Type of sectors by emissions intensity					
0: In sector with low emissions intensity				45	
1: In sector with high emissions intensity				55	
Type of Ownership					
0: Non-SOEs/Private company				76	
1: SOEs				24	

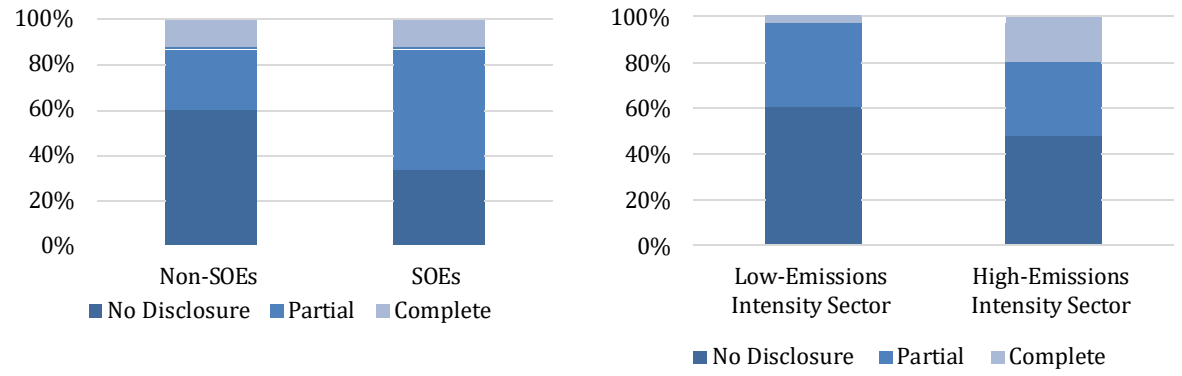

Figure 2. The disclosure comparison between companies by ownership type and type of sector

Table 3 represents the correlation coefficients among the variables. The results reveal a significant correlation between the variables – namely, type of sector, company size, and profitability - with the disclosure variable. This indicates that companies operating in high-emission sector, larger in size and more profitable are tending to offer better disclosure regarding actions to mitigate climate change. Similarly, the type of ownership variable also displays a positive correlation with the disclosure variable. However, these correlations are not statistically significant at any level. This may suggest that different type of ownership do not necessary imply companies' disclosure behavior. Nevertheless, the correlation analysis solely shows relationships between two variables, ignoring potential impacts from other influencing factors (Jin et al., 2021). Hence, a regression analysis that factors in other potential influences is necessary to gain a deeper understanding of these relationships.

Table 3. Pearson's correlation matrix

	Disclosure	Type of Ownership	Type of Sector	Company Size	Profitability
Disclosure	1.000				
Type of Ownership	0.1447 (0.1510)	1.000			
Type of Sector	0.2122** (0.0340)	-0.0565 (0.5768)	1.000		
Company Size [Ln(Assets)]	0.3476*** 0.0004	0.4503*** 0.0000	-0.2683*** 0.0070	1.000	
Profitability	0.2550** 0.0105	0.1788* 0.0751	-0.0747 0.4602	0.5433*** 0.0000	1.000

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The results of the ordered logit regression are shown in Table 4. The estimation indicates that the variables related to the type of sector and company size significantly influence the disclosure of climate change mitigation efforts at a 1 percent significance level. however, the variables associated with ownership type and profitability do not exhibit a significant impact on the dependent variable.

Table 4. Ordered Logit Estimation Results

Variables	Ordered Logit Model	
	Estimates	Odd ratios
Type of Ownership	-0.0663	0.936
	(0.506)	(0.473)
Type Sector	1.461***	4.312***
	(0.470)	(2.027)
Company Size [Ln(Assets)]	0.756***	2.129***
	(0.223)	(0.475)
Profitability	3.96×10^{-6}	1.000
	(4.58×10^{-5})	(4.58×10^{-5})
Observations	100	100
Proportionality Tests		
Wolfe Gould	9.982	
	(0.041)	
Brant	6.718	
	(0.152)	
score	8.377	
	(0.079)	
LR	10.3	
	(0.036)	
Wald	6.276	
	(0.179)	

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

However, the ordered logit regression estimation needs to meet the parallel lines assumption. Utilizing the "oparallel" command in STATA, the various tests including Wolfe Gould, Brant, Score, LR and Wald tests (Halkos & Skouloudis, 2016) assess this assumption. Most test shows significant result, indicating a violation of the parallel lines assumption. Consequently, this study addresses this issue by employing a generalized ordered logit model (GOLM) regression.

Table 5 shows the result of GOLM regressions, which bear similarities to the estimated results from the ordered logit model in Table 4. The type of sector and company size exhibit significant effects on the disclosure of climate change mitigation efforts', while the effect of the ownership type and profitability remains insignificant in this context. However, the GOLM proves advantageous over the ordered logit model because of its relaxation of the parallel-lines assumption.

Table 5. Generalized Ordered Logit estimation results

Variables	No disclosure		Partial disclosure	
	Coeff	Odds Ratio	Coeff	Odds Ratio
Type of Ownership	-0.008	1.008	-0.008	1.008
	(0.519)	(0.523)	(0.519)	(0.523)
Type Sector	1.044**	2.840**	3.674**	39.395**
	(0.485)	(1.377)	(1.205)	(47.475)
Company Size [Ln(Assets)]	0.728***	2.071***	0.728***	2.071***
	(0.227)	(0.470)	(0.227)	(0.470)
Profitability	3.79×10^{-5}	1.000	3.79×10^{-5}	1.000
	(5.47×10^{-5})	(5.47×10^{-5})	(5.47×10^{-5})	(5.47×10^{-5})
Observations	100			
Log likelihood	-80.35			
Pseudo R-Square	0.174			

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The GOLM regressions results are effectively interpreted using odds ratio instead of coefficient. In Table 4, the odds ratio for the 'type of ownership' variable is 1.008 in both panels (1 vs 2+3; 1+2 vs 3), yet it lacks statistically significant. This implies no significant difference between private companies and SOEs in reporting climate change mitigation efforts. This outcome contradict the hypothesis regarding ownership type, aligning with previous studies by Peng et al. (2015), Halkos and Skouloudis (2016), Faisal et al. (2018), and Kumar (2022). Jin et al. (2021) state that social pressure in emerging countries is lower compared to developed countries, where government influence significant shapes business political legitimacy. Consequently, this scenario indicates that SOEs, possessing strong political legitimacy, might be less responsive to regulatory pressure. Moreover, Ieng Chu et al. (2013) explain that SOEs lack autonomy in energy investment and exhibit low motivation to report environmental performance due to minimal influence from private parties. Additionally, Faisal et al. (2018) argue that Indonesian SOEs report environmental impact primarily to comply with government regulations, despite facing high expectations in addressing climate change. Furthermore, Indonesia lacks specific laws mandating GHG information disclosure, including climate change mitigation action, unlike developed countries in the EU that have stringent regulations requiring disclosure of social and environmental information (Camilleri, 2015). For instance, the UK government enacted the Climate Change Act in 2008, compelling companies to measure and report their emissions.

Another significant result from this study is the odds ratio values derived from the 'type of sector' variable, which are 2.840 (1 vs 2+3) and 39.395 (1+2 vs 3), significant at the 5% and 1% confidence levels, respectively (Tabel 5). These values signify that companies operating in high-level emissions sectors tend to provide more comprehensive disclosure regarding their climate change mitigation actions. This finding aligns with the hypothesis proposition, indicating that Indonesian companies operating in these "sensitive sectors" exhibit an awareness of enhancing their disclosure of environmental impact. Given their considerable negative influence on communities (Faisal et al., 2018), companies in such sectors are obliged to satisfy a broad spectrum of stakeholders. Thus, these companies must prioritize and improve the communication

of their effort to in addressing climate change issues, while mitigating their detrimental environmental effects.

Furthermore, the odds ratio value for the company's size is at 2.071 for both panels (1 vs 2+3; 1+2 vs 3) and is significant at the 1% of confidence level. This indicates the larger companies tend to exhibit increased disclosure in their climate change mitigation efforts. This finding aligns with previous studies conducted by Ieng Chu et al. (2013) and Chithambo and Tauringana (2014), which have also reported similar results in their estimations. Ieng Chu et al. (2013) state that a company's larger size makes it more visible to society compared to smaller entities. Therefore, larger companies might disclose more information about their climate change mitigation efforts as a strategy to maintain their corporate image.

This study also reveals that the odds ratio for the company's profitability is at 1.000 in both in panels (1 vs 2+3) and (1+2 vs 3), and it is not statistically significant at any confidence level. This finding contradicts the hypothesis, which predicts that profitability positively effects the company's reporting on pro-environmental activities. According to Faisal et al. (2018), companies with lower economic performance tend to prioritize boosting their financial condition over their responsibility. However, in 2020, all companies faced the negative impacts of the COVID-19 pandemic, affecting the operations of most companies. Hence, companies across varying profitability levels did not prioritize environmental improvement as their top concern.

5. Conclusion

This study explores the status and determinants of climate change mitigation efforts reporting among the top-100 companies in Indonesia. The results show that there remains a relatively small number of companies providing complete reporting on their initiatives to mitigate climate change. Contrary to hypothesis, SOEs do not exhibit better reporting on climate change mitigation efforts. Instead, companies operating in high-emissions sectors and those with larger sizes demonstrate better disclosure compared to counterparts with opposite characteristics. Notably, profitability, as a company characteristic, shows no significant impact on the disclosure of climate change mitigation effort.

The study's findings highlight the need Indonesian companies, especially SOEs, to improve their reporting on climate change mitigation efforts, aiming for more sustainable approach compared to private companies. While the COVID-19 pandemic's influence might divert attention from climate change issues, overlooking this concern could lead to larger long-term problem. Therefore, government intervention through regulations mandating improved climate change mitigation efforts and its disclosure become imperative. These regulations should target, but not exclusively, companies of any ownership type operating in low GHG intensity sectors, with smaller sizes or fewer assets. Such regulations would ensure transparency in company progress and performance in addressing climate change, subjecting them to scrutiny by broad stakeholders, including society.

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