THE FINANCIAL DRIVERS OF CSR DISCLOSURE: EVIDENCE FROM INDONESIAN COAL MINING COMPANIES

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ABSTRACT

This study explores the influence of company size, profitability, and leverage on Corporate Social Responsibility (CSR) disclosure among coal mining companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. Despite the increasing global emphasis on sustainability reporting, research on CSR disclosure determinants in emerging markets, particularly in coal mining industry, remains limited. This study is examining how financial and organizational factors shape CSR disclosure in a sector that faces intense scrutiny due to its environmental and social footprint. Utilizing stakeholder theory, legitimacy theory, and resource-based theory, the research employs multiple linear regression analysis to investigate these relationships. The findings reveal that company size positively impacts CSR disclosure, indicating that larger firms are more likely to engage in CSR activities to meet stakeholder expectations and maintain legitimacy. However, profitability and leverage do not significantly affect CSR disclosure, suggesting that financial performance and risk levels do not directly dictate CSR practices in the examined companies. These results underscore the importance of contextual factors and strategic resource allocation in understanding CSR disclosure. For policymakers, the findings highlight the need for regulatory measures that encourage all firms, regardless of size or financial standing, to enhance transparency in sustainability reporting. For corporate managers, it suggests that CSR disclosure should not be solely driven by financial performance but rather integrated into long-term stakeholder engagement and risk management strategies. Given the growing expectations for environmental accountability, companies should proactively align their CSR initiatives with regulatory trends and stakeholder demands to enhance legitimacy and competitive advantage.
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Keywords:
Corporate Social Responsibility (CSR) Disclosure, Company Size, Profitability, Leverage, Indonesian Coal Mining Companies.

ABSTRAK

Studi ini mengeksplorasi pengaruh ukuran perusahaan, profitabilitas, dan leverage terhadap pengungkapan Tanggung Jawab Sosial Perusahaan (CSR) di antara perusahaan pertambangan batu bara yang terdaftar di Bursa Efek Indonesia (BEI) dari tahun 2019 hingga 2023. Meskipun penekanan global terhadap pelaporan keberlanjutan semakin meningkat, penelitian tentang penentu pengungkapan CSR di pasar negara berkembang, khususnya di industri pertambangan batu bara, masih terbatas. Studi ini mengkaji bagaimana faktor keuangan dan organisasi membentuk pengungkapan CSR di sektor yang menghadapi pengawasan ketat karena jejak lingkungan dan sosialnya. Dengan memanfaatkan teori pemangku kepentingan, teori legitimasi, dan teori berbasis sumber daya, penelitian ini menggunakan analisis regresi linier berganda untuk menyelidiki hubungan ini. Temuan penelitian mengungkapkan bahwa ukuran perusahaan berdampak positif terhadap pengungkapan CSR, yang menunjukkan bahwa perusahaan yang lebih besar lebih mungkin terlibat dalam kegiatan CSR untuk memenuhi harapan pemangku kepentingan dan mempertahankan legitimasi. Namun, profitabilitas dan leverage tidak memengaruhi pengungkapan CSR secara signifikan, yang menunjukkan bahwa kinerja keuangan dan tingkat risiko tidak secara langsung mendikte praktik CSR di perusahaan yang diperiksa. Hasil ini menggarisbawahi pentingnya faktor kontekstual dan alokasi sumber daya strategis dalam memahami pengungkapan CSR. Bagi para pembuat kebijakan, temuan ini menyoroti perlunya langkah-langkah regulasi yang mendorong semua perusahaan, terlepas dari ukuran atau posisi keuangan, untuk meningkatkan transparansi dalam pelaporan keberlanjutan. Bagi manajer perusahaan, hal ini menunjukkan bahwa pengungkapan CSR tidak boleh hanya didorong oleh kinerja keuangan tetapi diintegrasikan ke dalam keterlibatan pemangku kepentingan jangka panjang dan strategi manajemen risiko. Mengingat meningkatnya harapan untuk akuntabilitas lingkungan, perusahaan harus secara proaktif menyelaraskan inisiatif CSR mereka dengan tren regulasi dan tuntutan pemangku kepentingan untuk meningkatkan legitimasi dan keunggulan kompetitif.

Kata Kunci: Pengungkapan Corporate Social Responsibility (CSR), Ukuran Perusahaan, Profitabilitas, Leverage, Perusahaan Pertambangan Batubara Indonesia.

ARTICLE INFO

INTRODUCTION

Corporate Social Responsibility (CSR) has evolved from a peripheral concern to a central component of business strategy, reflecting the growing importance of ethical, social, and environmental considerations in corporate governance. While prior research has extensively explored the relationship between CSR and various financial metrics, there remains a significant gap in understanding how these relationships manifest in different contexts, particularly within emerging markets like Indonesia. This study seeks to fill this gap by examining the nuanced interactions between company size, profitability, leverage, and CSR disclosure, with a specific focus on the Indonesian corporate landscape.

The integration of CSR into corporate strategy is increasingly viewed as a critical determinant of a company's long-term success. However, the mechanisms through which financial factors influence CSR activities remain underexplored, particularly in the context of developing economies. The existing literature has primarily focused on CSR in developed markets, often overlooking the unique challenges and opportunities present in emerging markets (Visser, 2008). This study aims to address this gap by providing empirical evidence on how company size, profitability, and leverage impact CSR disclosure in Indonesia, a market characterized by different regulatory frameworks, stakeholder expectations, and economic conditions.

Although previous studies have established a link between financial performance and CSR, they often lack a comprehensive theoretical framework to explain why and how these relationships vary across different contexts. For instance, while larger firms are generally expected to disclose more CSR activities due to greater scrutiny and resources, the specific dynamics in emerging markets, where regulatory oversight may be weaker and social expectations different, are not well understood (Jamali & Neville, 2011). Similarly, the impact of profitability and leverage on CSR disclosure has yielded mixed results, with some studies suggesting a positive relationship, while others find no significant effect or even a negative correlation (Waddock & Graves, 1997; McGuire et al., 1988). This study seeks to advance the literature by exploring these inconsistencies and providing a context-specific analysis.

The primary objective of this study is to investigate the influence of company size, profitability, and leverage on CSR disclosure within the Indonesian market. Specifically, it aims to answer the following research questions: How does company size affect CSR disclosure in Indonesian companies?, What is the impact of profitability on CSR disclosure, and how does it vary across different levels of profitability?, and in what ways does leverage influence CSR disclosure, and what are the implications for companies with varying degrees of financial risk?

This study is grounded in several theoretical perspectives, including stakeholder theory, legitimacy theory, and resource-based theory, which together provide a robust framework for understanding the financial determinants of CSR disclosure. Stakeholder theory posits that companies must address the interests of all their stakeholders, not just shareholders, leading to greater engagement in CSR activities

(Freeman, 1984). Legitimacy theory suggests that companies engage in CSR to gain legitimacy and maintain their social license to operate, particularly in markets where corporate actions are closely monitored by stakeholders (Suchman, 1995). Resource-based theory further explains how financially stronger companies can leverage their resources to implement CSR initiatives more effectively (Barney, 1991). By integrating these three perspectives, this study contributes to the theoretical discourse by providing a multi-theory explanation of the financial determinants of CSR disclosure, addressing gaps in prior research that often rely on single-theory perspectives.

Methodologically, this study employs a multiple linear regression analysis to examine the relationship between company size, profitability, leverage, and CSR disclosure, using data from Indonesian companies listed on the IDX. The use of the Corporate Social Responsibility Disclosure Index (CSRDI), as developed by Sembiring (2005), allows for a detailed assessment of CSR activities reported in annual reports. By focusing on a sample of companies from the coal mining sector, this study provides insights into an industry that is both economically significant and environmentally sensitive, making CSR particularly pertinent.

This study makes a significant empirical contribution by being the first to examine CSR disclosure determinants among IDX-listed coal mining firms from 2019 to 2023. Given the coal sector's substantial economic role and environmental impact, this research offers industry-specific insights into CSR disclosure practices in an emerging market context.

Preliminary findings suggest that company size and profitability are positively associated with CSR disclosure, while leverage has a more complex relationship that varies depending on the specific financial structure of the company. These results contribute to the existing literature by highlighting the importance of context in understanding the financial determinants of CSR. The findings have practical implications for policymakers and corporate managers in emerging markets, suggesting that CSR initiatives should be tailored to the specific financial characteristics of firms to be more effective.

The remainder of this paper is organized as follows: The next section reviews the relevant literature and theoretical frameworks that inform this study. Following this, the research methodology is described, detailing the data collection process, variables, and analytical techniques used. The results section presents the findings of the empirical analysis, followed by a discussion of their implications. The paper concludes with a summary of the key findings, limitations of the study, and suggestions for future research.

LITERATURE REVIEW
Corporate Social Responsibility (CSR) has increasingly become a focal point for both scholars and practitioners, particularly regarding the factors that influence CSR disclosure. In examining the Indonesian coal mining sector, it is crucial to consider the broader corporate landscape, where recent studies have explored the influence of sustainability practices, Business Process Automation (BPA), and market dynamics on corporate strategies, emphasizing the importance of strategic investments in CSR and related disclosures (Rahardja, 2024; Ramadhan, 2024; Ramadhan et al., 2024). Understanding how financial determinants like company size, profitability, and leverage impact CSR disclosure is essential for grasping the broader implications of CSR practices across different organizational contexts.

Huang and Ge (2024) highlight that ESG disclosure in mining companies varies significantly between

developed and developing markets, with firms in emerging economies often facing weaker regulatory enforcement and different stakeholder pressures. Similarly, Amos and Boahen (2024) and Suleman Dauda (2024) emphasize the role of community expectations in shaping CSR initiatives, particularly in the extractive industries, where operations can have substantial environmental and social consequences.

CSR encompasses a broad range of practices that reflect a company's commitment to contributing positively to society beyond its economic and legal obligations (Carroll, 1999). CSR activities are often reported in annual sustainability reports, which are increasingly scrutinized by stakeholders, including investors, customers, and regulators. The Corporate Social Responsibility Disclosure Index (CSRDI), as proposed by Sembiring (2005), is a widely recognized tool used to quantitatively assess the extent and quality of CSR disclosures. The CSRDI evaluates the breadth and depth of CSR activities reported by companies, providing a standardized measure of CSR engagement.

Stakeholder Theory

Stakeholder theory posits that companies have a responsibility to address the interests of all their stakeholders, not just shareholders. This theory suggests that firms engage in CSR activities to meet the expectations of various stakeholder groups, including employees, customers, suppliers, communities, and governments (Freeman, 1984). In the context of company size, larger firms are often subject to greater scrutiny from a broader range of stakeholders, leading to more comprehensive CSR disclosures (Roberts, 1992). Larger companies, therefore, tend to engage in CSR to maintain positive relationships with their stakeholders, enhancing their reputation and securing long-term business success (Donaldson & Preston, 1995).

Stakeholder theory also provides insight into the relationship between profitability and CSR. More profitable firms have greater financial resources, which allows them to invest in CSR activities as a means of addressing stakeholder demands (Waddock & Graves, 1997). The theory suggests that these investments can lead to enhanced stakeholder trust and loyalty, ultimately contributing to sustained profitability (Orlitzky et al., 2003).

In terms of leverage, stakeholder theory suggests that highly leveraged companies might face pressure from creditors and other financial stakeholders to adopt CSR practices as a risk management strategy (Jensen, 1986). By engaging in CSR, these firms can signal their commitment to ethical practices, thereby reducing the perceived risk among stakeholders and potentially lowering their cost of capital (Spence, 1973).

Legitimacy Theory

Legitimacy theory asserts that companies engage in CSR activities to gain legitimacy and maintain their social license to operate (Suchman, 1995). This theory is particularly relevant in the context of company size, as larger firms are often more visible and thus more vulnerable to public scrutiny (Gray et al. 1995). To protect their legitimacy, large companies are more likely to engage in extensive CSR reporting, demonstrating their commitment to social and environmental responsibilities.

In terms of profitability, legitimacy theory suggests that profitable companies have a greater capacity to engage in CSR, as they can afford to allocate resources to activities that reinforce their legitimacy in the eyes of stakeholders (O'Donovan, 2002). These firms may use CSR as a tool to enhance their image and justify their success, particularly in industries where social and environmental impacts are closely monitored (Deegan, 2002).

For leveraged firms, legitimacy theory implies that engaging in CSR can be a strategic response to legitimacy threats, especially when high levels of debt raise concerns about financial stability (Cormier et al., 2005). By demonstrating a commitment to CSR, highly leveraged companies can reassure stakeholders of their long-term viability and ethical commitment, thus maintaining their legitimacy in the market.

Resource-Based Theory
Resource-based theory (RBT) focuses on the internal capabilities and resources of a firm as the primary drivers of competitive advantage (Barney, 1991). From this perspective, company size and profitability are critical resources that enable firms to engage in CSR activities more effectively. Larger firms, with their abundant resources, are better positioned to implement CSR initiatives that can enhance their competitive advantage by differentiating them from competitors (Hart, 1995).

Profitability, as a measure of a firm's financial health, provides the necessary resources for engaging in CSR. According to resource-based theory, profitable companies are more likely to invest in CSR because it can lead to the development of intangible assets such as reputation, customer loyalty, and brand equity, which are critical for sustaining long-term competitive advantage (Wernerfelt, 1984).

Leverage, on the other hand, presents a more complex relationship with CSR from a resource-based perspective. While high leverage can constrain a firm's ability to invest in CSR due to financial pressures, resource-based theory suggests that firms with strong financial management capabilities might still engage in CSR as a strategic investment to enhance their resources and capabilities (Margolis & Walsh, 2003). Such firms might use CSR to build social capital and improve stakeholder relationships, thereby securing resources that can support long-term growth and stability (Fombrun, 1996).

Company Size
Empirical studies consistently show a positive relationship between company size and CSR disclosure. Larger companies tend to disclose more information about their CSR activities, driven by their greater resources and the higher level of scrutiny they face from stakeholders (Cowen et al.,1987). These companies are also more likely to use CSR as a tool to manage their public image and stakeholder relations, in line with the predictions of stakeholder theory and legitimacy theory (Roberts, 1992).

Profitability
The impact of profitability on CSR disclosure is more nuanced. While many studies find a positive relationship between profitability and CSR, suggesting that profitable firms are better able to invest in CSR activities (Waddock & Graves, 1997), others highlight potential trade-offs. For instance, in highly competitive industries, firms may prioritize short-term profitability over long-term CSR investments, particularly when facing pressure to deliver financial returns to shareholders (Friedman, 1970). Nonetheless, resource-based theory suggests that profitability enables firms to engage in CSR as a means of building intangible assets that contribute to sustainable competitive advantage (Barney, 1991).

Leverage
The relationship between leverage and CSR disclosure is complex and context-dependent. While some studies suggest that highly leveraged firms might reduce CSR activities due to financial constraints

(Jensen, 1986), others propose that these firms may actually increase their CSR efforts to mitigate the risks associated with high debt levels (Roberts, 1992). By engaging in CSR, leveraged firms can enhance their legitimacy and signal their commitment to ethical practices, potentially reducing the perceived risk among investors and creditors (Spence, 1973).

Hypotheses Development
Previous research has yielded varying conclusions regarding the effects of company size, profitability, and leverage on CSR disclosure. To clarify these relationships, this study formulates the following hypotheses based on a comprehensive analysis of prior findings:

The Impact of Company Size on Corporate Social Responsibility (CSR)
Several studies suggest a positive relationship between company size and CSR disclosure. Research by Dewi & Sedana (2019), Auliani (2019), Yanti & Budiasih (2016), Astuti (2019), Alvina et al. (2021), Vivian et al. (2020), and Malisa et al. (2022) all indicate that larger companies tend to disclose more CSR information. Similarly, Juniartha and Sugiarto (2020) concluded that company size, measured using the natural logarithm (Ln), positively influences CSR disclosure. However, studies by Ali et al. (2021), Fatin & Wahyuni (2019), Aulia & Heryanto (2022), and Yassmien & Muslih (2020) found no significant impact of company size on CSR disclosure.

Hypothesis 1: Larger companies within the Indonesian coal mining sector are more inclined to engage in and disclose CSR activities compared to their smaller counterparts. This hypothesis is supported by stakeholder theory, which suggests that larger firms experience greater scrutiny from stakeholders, thereby motivating them to provide more comprehensive CSR disclosures (Roberts, 1992). Additionally, legitimacy theory posits that larger firms are more likely to disclose CSR information to maintain their social license to operate (Cowen et al., 1987).

The Impact of Profitability on Corporate Social Responsibility (CSR)
The majority of studies, including those by Ali et al. (2021), Juniartha and Sugiarto (2020), Aulia & Heryanto (2022), Dewi & Sedana (2019), Auliani (2019), Yanti & Budiasih (2016), Astuti (2019), Yassmien & Muslih (2020), and Malisa et al. (2022), indicate that profitability positively impacts CSR disclosure. However, some studies, such as those by Fatin & Wahyuni (2019) and Alvina et al. (2021), found no significant relationship.

Hypothesis 2: Companies with higher profitability in the Indonesian coal mining sector are more likely to disclose CSR activities than less profitable companies.
This hypothesis is rooted in resource-based theory, which asserts that more profitable firms have the resources to invest in CSR initiatives, viewing them as a strategic tool to build intangible assets and gain a competitive advantage (Barney, 1991). The correlation between profitability and CSR disclosure also reflects a company's capacity to meet stakeholder expectations (Waddock & Graves, 1997).

The Impact of Leverage on Corporate Social Responsibility (CSR)
Several studies have found that leverage negatively affects CSR disclosure, including those by Aulia & Heryanto (2022), Dewi & Sedana (2019), Auliani (2019), Astuti (2019), Yassmien & Muslih (2020), Alvina et al. (2021), and Vivian et al. (2020). Conversely, Ali et al. (2021), Fatin & Wahyuni (2019), Juniartha and Sugiarto (2020), Yanti & Budiasih (2016), and Malisa et al. (2022) found a positive relationship between leverage and CSR disclosure. Uyar et al. (2024) also argue that CSR transparency and credibility can enhance relationships with creditors in emerging markets, suggesting that firms with

stronger CSR disclosures may enjoy improved access to financing. A potential explanation for these conflicting results is that highly leveraged firms may engage in CSR disclosure as a strategic tool to signal financial stability and corporate responsibility to creditors and investors. According to signaling theory (Spence, 1973), firms with higher financial risk might disclose more CSR activities to reassure stakeholders of their long-term sustainability. Additionally, legitimacy theory (Suchman, 1995) suggests that leveraged firms use CSR disclosure to maintain credibility and reduce perceived risk among external stakeholders.

Hypothesis 3: Companies with higher leverage in the Indonesian coal mining sector may use CSR disclosure as a strategic signaling tool to reassure creditors and investors, mitigating financial risk perceptions and enhancing their legitimacy. This hypothesis acknowledges the complexity of previous findings, where high leverage could either restrict CSR activities due to financial constraints (Jensen, 1986) or lead to increased CSR efforts to enhance legitimacy and mitigate perceived risks among investors and creditors (Spence, 1973).

Combined Impact of Company Size, Profitability, and Leverage on Corporate Social Responsibility (CSR)

The combined influence of company size, profitability, and leverage on CSR disclosure has been studied by several researchers, leading to the hypothesis that these variables jointly affect CSR disclosure.

Hypothesis 4: Company size, profitability, and leverage simultaneously influence Corporate Social Responsibility (CSR) disclosure.

Research Model

The existing literature provides valuable insights into the relationships between company size, profitability, leverage, and CSR disclosure. However, much of the research has been descriptive, with limited critical analysis of the theoretical arguments and empirical findings. Previous studies often present these relationships in isolation, failing to integrate them into a coherent theoretical framework. For example, while it is well-documented that larger firms engage more in CSR, there is less clarity on the mechanisms through which company size influences CSR beyond increased visibility and stakeholder pressure (Cowen et al., 1987). Similarly, while profitability is generally associated with higher CSR disclosure, the reasons behind this relationship are not always well-articulated. Existing studies often overlook the strategic role of CSR in enhancing stakeholder relationships and securing competitive advantages (Orlitzky et al., 2003). The impact of leverage on CSR is also underexplored, with mixed findings regarding whether high leverage constrains or incentivizes CSR engagement (Spence, 1973).

This literature review identifies several critical gaps in the current understanding of Corporate Social Responsibility (CSR) disclosure, particularly within the context of Indonesian coal mining companies. First, there is a clear need for a more integrated theoretical framework that synthesizes stakeholder theory, legitimacy theory, and resource-based theory to elucidate the complex relationships between financial factors—such as company size, profitability, and leverage—and CSR disclosure. Such an integrated approach is essential for capturing the multifaceted nature of CSR, which is influenced by both internal corporate dynamics and external stakeholder pressures. Second, empirical research must more rigorously address the context-specific dynamics of CSR, especially in emerging markets like Indonesia. The regulatory environments, cultural contexts, and stakeholder expectations in these

markets differ significantly from those in developed economies, necessitating a localized understanding of how CSR practices and disclosures are shaped. The current body of literature has often overlooked these differences, leading to a gap in knowledge regarding the unique drivers of CSR disclosure in markets like Indonesia.

By critically analyzing these theoretical perspectives and their application to CSR disclosure in the Indonesian context, this study aims to advance the literature by providing a more nuanced understanding of how financial factors interact with CSR practices. This study contributes to the development of a more comprehensive theoretical framework that accounts for the interplay between stakeholder expectations, corporate legitimacy, and the strategic use of resources in CSR initiatives. Furthermore, it offers empirical evidence that can inform both academic research and practical CSR strategies, particularly within the Indonesian coal mining sector. This study adopts a constructivist ontology, viewing CSR practices and disclosures as socially constructed phenomena shaped by interactions among various stakeholders. Constructivism posits that reality is not objective but is constructed through social processes, including the expectations and perceptions of different stakeholders (Gergen, 1999). In the context of CSR, this perspective suggests that the nature of CSR practices and disclosures is influenced by how firms and stakeholders perceive and interpret these practices, particularly in a complex and dynamic industry like coal mining.

To provide a visual representation of the conceptual framework outlined above, a schematic diagram is presented below in Figure 1.
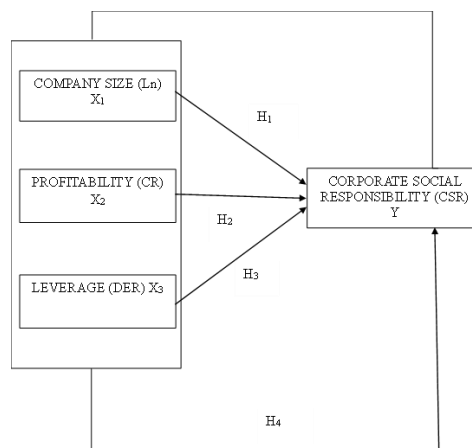

Figure 1: Research Model

Given this constructivist ontology, the study employs an-interpretivist epistemology, which focuses on understanding how individuals and organizations perceive and interpret CSR practices. Interpretivism seeks to uncover the subjective meanings and experiences of stakeholders regarding CSR disclosure. This approach is particularly valuable for exploring how company size, profitability, and leverage influence CSR practices through the lens of stakeholder perceptions and organizational strategies (Creswell & Clark, 2017). By adopting this epistemological stance, the study provides deeper insights into the social and contextual factors that drive CSR disclosure in Indonesian coal mining companies, offering a rich and contextually grounded understanding of CSR in this sector.

METHODS

This study focuses on coal mining companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period. The research was conducted from February to July 2024. The population of this study consists of all 60 coal mining companies listed on the IDX between 2019 and 2023. According to Sugiyono (2017), a population refers to the entire group of subjects or objects that meet specific

characteristics defined by the researcher. However, not all companies within this population meet the necessary criteria for inclusion in the study. To ensure relevance and consistency in the data, this study employs purposive sampling, a technique that allows researchers to select a sample based on specific considerations.

To be included in the sample, a company must be a coal mining firm listed on the IDX during 2019–2023 and must have published financial statements for each year in that period. Additionally, the financial statements must be reported in Rupiah (IDR), and the company must have consistently published sustainability reports during 2019–2023. Based on these criteria, only 21 companies qualified for the study. Since these 21 firms represent the entire population of coal mining companies that meet the eligibility requirements, the sample is considered comprehensive and reflective of the industry segment under investigation. This study relies on secondary data sources, primarily obtained from financial and sustainability reports of coal mining companies for the period 2019–2023. These reports were accessed through the official IDX website (www.idx.co.id) as well as the respective companies' official websites. The study also utilizes the Global Reporting Initiative (GRI) Standards 2021, issued by the Global Sustainability Standards Board (GSSB), as the framework for measuring CSR disclosure.

Following a quantitative research approach as outlined by Sugiyono (2017), this study is systematic, structured, and designed to ensure clarity from the research planning phase to the presentation of findings. The analysis applies descriptive statistics and multiple linear regression analysis, conducted using E-views 12 software. The study employs panel data, which combines cross-sectional data (21 coal mining firms) with time-series data (2019–2023). This panel data approach allows for a more comprehensive analysis of CSR disclosure trends and their relationship with firm characteristics over time.

The dependent variable in this study is CSR disclosure, measured using the Corporate Social Responsibility Disclosure Index (CSRDI). This index is constructed based on the Global Reporting Initiative (GRI) Standards 2021, which specify 117 disclosure items. The CSRDI (Haniffa & Cooke, 2005) is calculated as follows:

$$\text{CSRDIj} = \frac{\sum Xij}{nj} \, x \, 100\%$$

Where CSRDIj represents the CSR Disclosure Index of the company. $\sum Xij$ is total items disclosed by the company; 0 if item not disclosed; 1 if item I is disclosed, and nj is the total number of required disclosure items, with 119 items to be disclosed.

The independent variables include, Company size is measured using the **natural logarithm of total assets**, following Brigham (2005):

$$\text{Size} = \text{LN Total Asset}$$

Profitability is measured using **Return on Assets (ROA)**, which captures a company's efficiency in generating profit relative to its assets. The formula follows Kasmir (2019):

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Asset}} \, x \, 100\,\%$$

Leverage reflects a company's financial risk and debt structure, measured using the **Debt to Equity Ratio (DER)** (Kasmir, 2019):

$$DER = \frac{\text{Total Liabilities}}{\text{Total Equity}}$$

This study employs **panel data regression** using **E-Views 12**, combining **cross-sectional** (21 firms) and **time-series** (2019–2023) data. Several classical assumption tests are conducted **normality Test** (Kolmogorov-Smirnov): $p > 0.05$ confirms normality, **Multicollinearity Test** (VIF < 10): No strong correlation between independent variables, **Heteroscedasticity Test** (Glejser): $p > 0.05$ suggests homoscedasticity, and **Autocorrelation Test** (Durbin-Watson & Wooldridge): No serial correlation if DW ≈ 2.

Model Specification Tests

To choose the model, we conduct the following tests: First, Chow Test: $p > 0.05$: Common Effect Model preferred. Second, Hausman Test: $p < 0.05$: Fixed Effect Model preferred. Third, Lagrange Multiplier Test: $p > 0.05$: Common Effect Model preferred.

Panel Data Regression & Hypothesis Testing

The study compares three models: First, Common Effect Model (CEM) – OLS estimation. Second, Fixed Effect Model (FEM) – LSDV estimation for individual/time effects. Third, Random Effect Model (REM) – GLS estimation. The multiple linear regression model used is:

$$Y = a + b_1 x_1 + b_2 x_2 b_3 x_3$$

Where: X1 = Company Size
Y = Social Responsibility Disclosure   X2 = Profitability
a = Constant   X3 = Leverage

Hypothesis testing: The study conduct three tests, First, **t-Test:** Assesses individual variable significance (5% level). Second, **F-Test:** Evaluates overall model fit (5% level). Third, **R²:** Measures explained variance.

RESULT AND DISCUSSION

This study examines coal mining companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023, chosen due to their environmental impact, including waste generation, pollution, and local community disturbances. The population consists of 60 companies, with data sourced from annual financial and sustainability reports available on the IDX website (https://www.idx.co.id/id). This study investigates the influence of company size, profitability, and leverage on CSR disclosure.

Table 1 describes the descriptive statistics that summarize the key characteristics of the variables. The dataset consists of 105 observations, covering company size, profitability, leverage, and CSR disclosure. The analysis reveals that company size ranges from 22.878 to 32.516 (mean: 29.325, SD: 2.472), Profitability varies from -354.001 to 45.445 (mean: 0.180, SD: 35.842), Leverage spans 0.050 to 24.849 (mean: 1.713, SD: 2.804), and CSR disclosure ranges from 0.043 to 1.000 (mean: 0.387, SD: 0.292).

Table 1: Descriptive Statistics

Date: 06/20/24   Time: 15:20
Sample: 2019 2023

	CSR (Y)	SIZE (X1)	ROA (X2)	DER (X3)
Mean	0.387139	29.32484	0.179617	1.712515
Median	0.273504	29.82286	1.918801	1.042620
Maximum	1.000000	32.51628	45.44490	24.84892
Minimum	0.042735	22.87835	-354.0018	0.050454
Std. Dev.	0.292256	2.472537	35.84173	2.804308
Skewness	0.726343	-1.189981	-9.292255	5.851759
Kurtosis	2.199302	3.759787	92.60516	46.11907
Jarque-Bera	12.03744	27.30654	36638.30	8733.493
Probability	0.002433	0.000001	0.000000	0.000000
Sum	40.64957	3079.108	18.85978	179.8141
Sum Sq. Dev.	8.883034	635.7979	133601.5	817.8709
Observations	105	105	105	105

Source: Data Processed using E-views 12, (2024)

Before estimating panel data, it is crucial to determine the most appropriate model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). To achieve this, several statistical tests are conducted, including the Chow test, Hausman test, and Lagrange Multiplier test from the table 2.

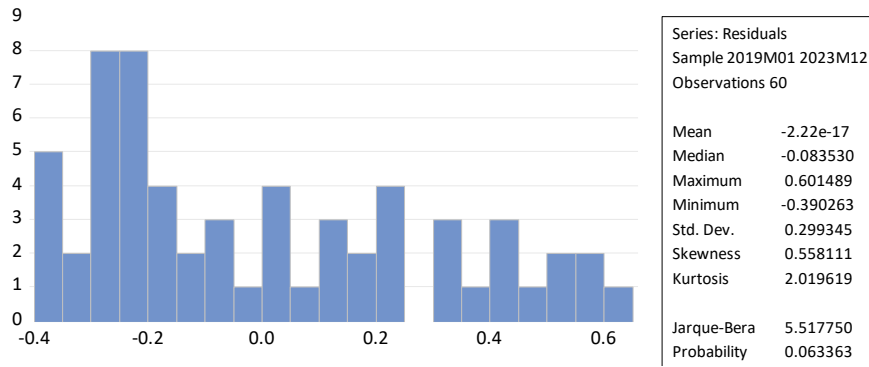**Table 2**: Model Selection Test Results

Test	Criteria	Sign	Result
Likelihood	Cross section	0,0002	Fixed Effect Model (FEM)
Hausman	Cross section	0,0234	Fixed Effect Model (FEM)
Lagrange Multiplier	Cross section	0,0172	Random Effect Model (REM)

Source: Data Processed using E-views 12, (2024)

The Chow test yields a significance level of 0.0002 (<0.05), indicating that the FEM is more suitable than the CEM. Similarly, the Hausman test produces a significance level of 0.0234 (<0.05), further supporting the FEM over the REM. However, the Lagrange Multiplier test reports a significance level of 0.0172 (<0.05), suggesting that the REM is preferable to the CEM. Considering the outcomes of all three tests, the FEM is selected as the most appropriate model for this study, as it is supported by both the Chow and Hausman tests as in table 2.

According to Ghozali (2018), the normality test is used to determine whether the residuals in the regression model have a normal distribution. The Jarque-Bera test is used in E-views 12 for this purpose. Based on the graph output above, the Jarque-Bera probability is 0.063363, which is greater than the significance level (α) of 0.05. Therefore, H0 is accepted, indicating that the residuals in the regression model are normally distributed.

Table 3: Normality Test

Series: Residuals	
Sample 2019M01 2023M12	
Observations 60	
Mean	-2.22e-17
Median	-0.083530
Maximum	0.601489
Minimum	-0.390263
Std. Dev.	0.299345
Skewness	0.558111
Kurtosis	2.019619
Jarque-Bera	5.517750
Probability	0.063363

Source: Data Processed using E-views 12, (2024)

According to Ghozali (2018), the multicollinearity test is used to determine whether there is any correlation between independent variables in the regression model. Multicollinearity can be identified by examining the variance inflation factor (VIF) and tolerance values. If VIF is less than 0.85, it indicates the absence of multicollinearity. Conversely, if the tolerance value is greater than 0.85, it indicates the absence of multicollinearity.

The output in Table 4 shows that the correlation values for each variable are less than 0.85. Therefore, H0 is accepted, indicating that there is no multicollinearity among the independent variables in the regression model.

Table 4: Multicollinearity Test

	X1	X2	X3
X1	1.000000	-0.041209	0.271352
X2	-0.041209	1.000000	-0.029291
X3	0.271352	-0.029291	1.000000

Source: Data Processed using E-views 12, (2024)

According to Ghozali (2018), the heteroscedasticity test is used to determine whether there is an unequal variance among residuals in different observations. The Glejser approach is used for this purpose, where the absolute value of the residuals is regressed against the independent variables. If the significance value is greater than 0.05, heteroscedasticity is not present. If the significance value is less than 0.05, heteroscedasticity is present.

Based on Table 4, the probability values for the company size variable are 0.4095, the probability values for profitability are 0.4801, and the probability values for leverage are 0.0891. These probability values are greater than 0.05, indicating that H0 is accepted and heteroscedasticity does not occur in this study.

Table 5: Heteroscedasticity Test

Dependent Variable: ABS(RESID)
Method: Panel Least Squares
Date: 06/25/24   Time: 12:16
Sample: 2019 2023
Periods included: 5
Cross-sections included: 21
Total panel (unbalanced) observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.202106	0.111719	1.809045	0.0734
X1	-0.003186	0.003847	-0.828248	0.4095
X2	0.000252	0.000255	0.988199	0.3254
X3	0.000483	0.003389	0.142527	0.8870

R-squared	0.017047	Mean dependent var		0.109575
Adjusted R-squared	-0.012441	S.D. dependent var		0.092659
S.E. of regression	0.093233	Akaike info criterion		-1.869725
Sum squared resid	0.869242	Schwarz criterion		-1.768018
Log likelihood	101.2257	Hannan-Quinn criter.		-1.828520
F-statistic	0.578099	Durbin-Watson stat		1.450585
Prob(F-statistic)	0.630731			

Source: Data Processed using E-views 12, (2024)

According to Ghozali (2018), the autocorrelation test is used to determine whether there is a correlation between residuals across periods (time series) or between observations (cross-sectional). In the absence of autocorrelation, the Durbin-Watson (DW) statistic should be close to 2. From tabel 6, the DW value from the output is 2.325381, which falls between the ranges of du = 1.7888 and dl = 1.5703, so H0 is accepted, indicating that there is no autocorrelation in the residuals.

Table 6: Autocorrelation Test

Dependent Variable: Y
Method: Panel Least Squares
Date: 06/25/24   Time: 15:09
Sample: 2019 2023
Periods included: 5
Cross-sections included: 21
Total panel (unbalanced) observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.856417	0.522155	-1.640157	0.1049
X1	0.043121	0.017859	2.414502	0.0180
X2	-0.000973	0.000807	-1.205541	0.2315
X3	-0.012232	0.011023	-1.109675	0.2705

Effects Specification				

Cross-section fixed (dummy variables)				

R-squared	0.380824	Mean dependent var		0.386670
Adjusted R-squared	0.202811	S.D. dependent var		0.293632
S.E. of regression	0.262171	Akaike info criterion		0.359532
Sum squared resid	5.498676	Schwarz criterion		0.969776
Log likelihood	5.304336	Hannan-Quinn criter.		0.606760
F-statistic	2.139302	Durbin-Watson stat		2.105613
Prob(F-statistic)	0.006802			

Source: Data Processed using E-views 12, (2024)

According to Ghozali (2018), the F-test, is used to determine whether all independent variables in the regression model jointly have a significant impact on the dependent variable. The testing criteria are as follows: if the F-statistic probability is less than the significance level (α) of 0.05, H0 is rejected, indicating that all independent variables jointly have a significant impact on the dependent variable. Thus, if the F-statistic probability is greater than the significance level (α) of 0.05, H0 is accepted, indicating that all independent variables jointly do not have a significant impact on the dependent

variable. The F-test results at table 6, show that the F-statistic probability is 0.006802, which is less than the significance level (α) of 0.05. This indicates that all independent variables in the model, including company size, profitability, and leverage, jointly have a significant impact on CSR disclosure.

Table 7: F-Test

R-squared	0.380824	Mean dependent var	0.386670
Adjusted R-squared	0.202811	S.D. dependent var	0.293632
S.E. of regression	0.262171	Akaike info criterion	0.359532
Sum squared resid	5.498676	Schwarz criterion	0.969776
Log likelihood	5.304336	Hannan-Quinn criter.	0.606760
F-statistic	2.139302	Durbin-Watson stat	2.105613
Prob(F-statistic)	0.006802		

Source: Data Processed using E-views 12, (2024)

The t-test is used to determine the partial effect of each independent variable on the dependent variable. The testing criteria are as follows: If the t-statistic probability is less than the significance level (α) of 0.05, H0 is rejected, indicating that the independent variable has a significant impact on the dependent variable. Thus, If the t-statistic probability is greater than the significance level (α) of 0.05, H0 is accepted, indicating that the independent variable does not have a significant impact on the dependent variable.

Table8: t-Test

Dependent Variable: Y
Method: Panel Least Squares
Date: 06/27/24   Time: 10:47
Sample: 2019 2023
Periods included: 5
Cross-sections included: 21
Total panel (unbalanced) observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.856417	0.522155	-1.640157	0.1049
X1	0.043121	0.017859	2.414502	0.0180
X2	-0.000973	0.000807	-1.205541	0.2315
X3	-0.012232	0.011023	-1.109675	0.2705

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.380824	Mean dependent var	0.386670
Adjusted R-squared	0.202811	S.D. dependent var	0.293632
S.E. of regression	0.262171	Akaike info criterion	0.359532
Sum squared resid	5.498676	Schwarz criterion	0.969776
Log likelihood	5.304336	Hannan-Quinn criter.	0.606760
F-statistic	2.139302	Durbin-Watson stat	2.105613
Prob(F-statistic)	0.006802		

Source: Data Processed using E-views 12, (2024)

The t-test results at table 8, shows that the t-statistic probability for the company size variable is 0.0180, which is less than the significance level (α) of 0.05. This indicates that company size has a significant impact on CSR disclosure. The t-statistic probability for the profitability variable is 0.2315, which is more than 0.05, indicating that profitability has no significant impact on CSR disclosure. The t-statistic probability for the leverage variable is 0.2705, which is more than 0.05, indicating that leverage has also no significant impact on CSR disclosure.

According to Ghozali (2018), the coefficient of determination (R-squared) is used to measure the proportion of the variance in the dependent variable that is predictable from the independent variables. The R-squared value ranges between 0 and 1. The closer the R-squared value is to 1, the better the

model explains the variance in the dependent variable. The Adjusted R-squared value from the table 8, is 20,2811%, indicating that 20,2811% of the variance in CSR disclosure is explained by the independent variables company size, profitability, and leverage. The remaining 79,7189% of the variance is explained by other factors not included in the model.

Table 8: Coefficient of Determination

R-squared	0.380824	Mean dependent var	0.386670
Adjusted R-squared	0.202811	S.D. dependent var	0.293632
S.E. of regression	0.262171	Akaike info criterion	0.359532
Sum squared resid	5.498676	Schwarz criterion	0.969776
Log likelihood	5.304336	Hannan-Quinn criter.	0.606760
F-statistic	2.139302	Durbin-Watson stat	2.105613
Prob(F-statistic)	0.006802		

Source: Data Processed using E-views 12, (2024)

The findings of this study, which examines the impact of company size, profitability, and leverage on CSR disclosure among Indonesian coal mining companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023, offer significant insights into CSR practices within this sector. These findings are interpreted through the lens of stakeholder theory, legitimacy theory, resource-based theory, and constructivist ontology, as well as interpretivist epistemology.

The study reveals a positive relationship between company size and CSR disclosure. The regression results show that for every one-unit increase in company size (measured as the natural logarithm of total assets), CSR disclosure increases by 0.3 points on the CSRDI scale. For instance, if a firm increases its total assets by 10%, this would be associated with an approximate 0.3-point increase in CSR disclosure on the CSRDI scale, indicating a stronger commitment to sustainability practices. This suggests that larger firms, due to their greater visibility and resource availability, tend to engage more in CSR activities and disclose them more comprehensively. These findings support stakeholder theory, which suggests that larger firms experience greater scrutiny and pressure to demonstrate social responsibility (Freeman, 1984). This aligns with previous studies, such as Ali et al. (2021) and Dewi & Sedana (2019), which found that larger firms tend to invest more in sustainability disclosures to maintain legitimacy and manage stakeholder expectations.

Moreover, these results can be interpreted through the lens of Matten & Moon's (2008) explicit-implicit CSR framework. In emerging markets like Indonesia, CSR disclosure among larger firms may reflect a combination of explicit CSR (voluntary corporate strategies aimed at enhancing reputation and competitive advantage) and implicit CSR (responses to regulatory and societal expectations). Larger firms are more likely to be influenced by both forces: their global operations and investor expectations may encourage explicit CSR practices, while local regulations and community expectations necessitate implicit CSR compliance.

Contrary to initial expectations and in contrast to some previous research (Fatin & Wahyuni, 2019; Alvina et al., 2021), this study found no significant effect of profitability on CSR disclosure among Indonesian coal mining companies. This suggests that while profitability provides financial resources, it does not necessarily translate into increased CSR disclosure. From a legitimacy theory perspective, profitable companies may choose not to prioritize CSR disclosure unless there is a-strong external pressure or stakeholder expectation. This finding aligns with the resource-based theory, which posits that the strategic deployment of resources is crucial for CSR activities, rather than just their availability.

Thus, Indonesian coal mining companies might focus their resources on other strategic areas rather than on enhancing CSR disclosure, despite their profitability.

The non-significant effect of leverage on CSR disclosure suggests that financial leverage alone does not drive sustainability reporting in Indonesian coal mining companies. This could be attributed to two main factors. First the coal mining industry in Indonesia operates under relatively standardized CSR disclosure expectations, influenced by sector-wide sustainability initiatives. Additionally, regulatory leniency regarding CSR disclosures for leveraged firms may reduce pressure from creditors, as financial institutions may prioritize financial stability over sustainability commitments. Instead, external pressures such as government regulations and environmental activism likely play a more dominant role in shaping CSR disclosure practices. This result is in line with the studies by Ali et al. (2021) and Fatin & Wahyuni (2019), suggesting that other factors, such as company size and stakeholder expectations, play a more substantial role in shaping CSR disclosure practices.

The study's findings underscore that CSR disclosure among Indonesian coal mining companies is influenced by a complex interplay of company size, profitability, and leverage. The significant effect of company size on CSR disclosure aligns with constructivist ontology, which views corporate social practices as constructed through interactions with various stakeholders and contextual factors. From an interpretivist epistemology perspective, the results highlight the importance of understanding CSR disclosure within the broader context of stakeholder expectations and legitimacy concerns. The findings suggest that while company size significantly impacts CSR disclosure, profitability and leverage do not have a direct effect. This aligns with the resource-based theory's emphasis on strategic resource utilization and the need for a nuanced understanding of how these factors interact to influence CSR disclosure. Additionally, the perspective by Rahardja (2004) on CSV creation suggests that the impacts of profitability and leverage on CSR disclosure may also evolve over time, potentially showing more pronounced effects in the next 2–3 years as companies align their financial, environmental, and empowerment efforts with their CSR goals.

CONCLUSION

In conclusion, this study underscores the potential advantages of integrating Digital Twins technology into drive-thru services to enhance operational efficiency and elevate the customer experience. Analysis of consumer surveys underscores the importance of addressing challenges such as prolonged wait times and service quality issues in drive-thru establishments. Through the deployment of Digital Twins, restaurant owners can gain valuable insights into customer behavior, traffic patterns, and staff performance, enabling them to streamline operations and enhance service delivery. The findings indicate that embracing innovations like AI voice assistants, personalized menus, and mobile payment solutions can help alleviate common challenges encountered by drive-thru patrons, ultimately resulting in heightened satisfaction and loyalty. Therefore, the successful integration of Digital Twins carries significant implications for the drive-thru industry, fostering a more seamless and tailored customer experience while driving business growth and competitiveness.

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