

## The Effect of Corporate Sustainability Performance on Profitability Moderated by Liquidity and Stock Price Volatility in Oil, Gas, and Coal Sub-Sector Companies of Indonesia in 2019-2023

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### Abstract

This study aims to investigate the Effect of Corporate Sustainability Performance on Profitability Moderated by Liquidity and Stock Price Volatility of Oil, Gas and Coal Sub-Sector Company in Indonesia. The population of this study is the oil, gas, and coal sub-sector firms listed on the Indonesia Stock Exchange in 2019-2023, with a total of 81 companies. By using the purposive sampling method, 14 samples were taken. This study uses panel data regression analysis to analyze the impact of sustainability (economic, social, and environmental) on firm profitability. Further, 38 criteria were utilized in the study to measure CSP to understand whether firms ranked high on sustainability parameters perform better than low-ranked firms. The results of this study show that corporate sustainability performance (CSP) has a positive and significant effect on profitability. Liquidity moderates the influence of corporate sustainability performance (CSP) on profitability, with the interaction coefficient value showing a negative influence. While stock price volatility moderates the effect of corporate sustainability performance (CSP) on return on equity (ROE), with a positive influence direction. Companies are advised to continuously improve the quality and scope of their sustainability programs, especially in environmental and social aspects, so that they can provide a positive image, improve their reputation, and have a direct impact on long-term profitability. This study provides insight into the factors influencing the profitability of mining companies in Indonesia. The findings of this study underline the importance of corporate sustainability performance, liquidity, and stock price volatility in improving mining company profitability.

**Keywords:** *Corporate Sustainability Performance, Liquidity, Profitability, Stock Price Volatility.*

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### INTRODUCTION

The high level of profitability is often a reflection of management's success in utilizing the assets owned by the company to increase shareholder value. However, amid increasing concern for sustainability and social responsibility issues, a company's profitability is now not only measured by financial achievements, but also by how the company can have a positive impact on the environment and society. Corporate Sustainability Performance (CSP) is seen as important in increasing profitability, especially in the context of modern business that demands the integration of economic, social, and environmental aspects in company operations. Sustainability can be fundamentally defined as being built on three elements: economic, environmental, and social. Stated as a reflection of the concept of sustainability in business, the concept of Corporate Sustainability Performance (CSP) is generally described as the integration of sustainability elements into the business (Dyllick & 2016).

Sustainability reports explain how businesses that adopt sustainability concepts perform in terms of sustainability, and a large number of companies that publish sustainability reports have grown recently (Morgan et al., 2021). (Ameer & Othman, 2012) found that companies that put more emphasis on sustainable practices achieve higher financial performance. In addition, Pan et al. (2014) concluded that sustainability has a positive impact on a company's profits.

This study uses liquidity as a variable that moderates CSP to profitability. (Bilqis & Yumna, 2024), found that Corporate Sustainability Performance with liquidity as a moderation variable has a positive and significant influence on profitability. These results are also consistent with the view (Yameen et al., 2019) of considering liquidity as a significant determinant of profitability. The next variable that was identified as a moderation variable in this study was stock price volatility. (Taha et al., 2023), found that stock price volatility strengthens the positive relationship between corporate sustainability performance (CSP) and profitability. These results are in line with the view

(Luo & Bhattacharya, 2009) that a company's participation in CSP can reduce stock price volatility.

This study provides insights into the relationship between sustainability performance and profitability moderated by liquidity and stock price volatility in the specific context of the mining sector in Indonesia. This research is expected to provide suggestions for companies to continue to improve the quality and scope of sustainability programs in economic, social, and environmental aspects.

## METHODS

This study uses a quantitative research approach to examine the relationship between the independent variable (corporate sustainability performance),

moderating variables (liquidity and stock price volatility), and the dependent variable (ROE). The population of this study is companies in the oil, gas, and coal sub-sector listed on the Indonesia Stock Exchange (IDX) from 2019-2023. The total population in this study is 81 companies for those registered in the last quarter of 2023.

The sampling technique used in this study is the purposive sampling method and was obtained by 14 companies in the oil, coal, and gas sub-sector on the IDX in 2019-2023. This research framework describes the relationship between independent variables, moderating variables, and dependent variables. The following is a visual representation of this research framework:

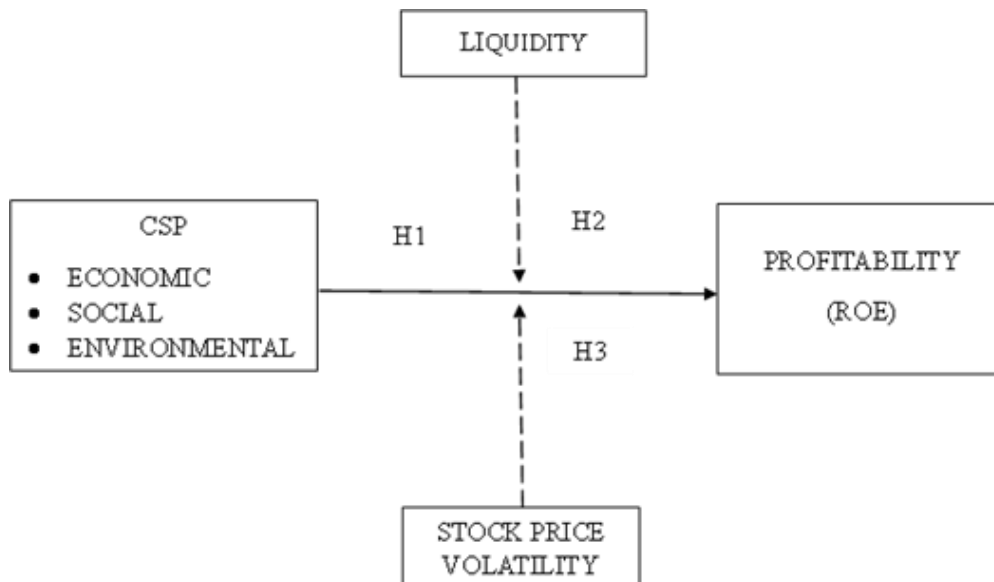


Figure 1. Research Framework

### Corporate Sustainability Performance (CSP)

Corporate sustainability performance includes three important aspects, namely economic performance, social performance, and environmental performance. The measurements in this study refer to research conducted by Taha et al. (2023). Economic performance is measured using 13 criteria of the Dow Jones Corporate Sustainability Assessment Methodology. Environmental performance was measured using 12 criteria of the Dow Jones Corporate Sustainability Assessment Methodology, and social

performance was measured using 13 criteria of the Dow Jones Corporate Sustainability Assessment Methodology. These criteria will then be given a score of 1 if disclosed, and otherwise will be given a score of 0 if not disclosed. After giving a score to each index, the score is then entered into the CSP formula.

According to Bilqis & Yumna (2024), the formula for the calculation of CSP is:

$$CSP = \frac{\text{number of items disclosed}}{\text{the number of items expected to be disclosed}}$$

Table 1. Dow Jones Corporate Sustainability Assessment Methodology

| No | Economic                         | Social  | Environmental                                |
|----|----------------------------------|---|--|
| 1  | Anti-crime policy                | Addressing Cost Burden                              | Biodiversity                                 |
| 2  | Brand management                 | Bioethics   | Business opportunities in financial services |
| 3  | Code of conduct                  | Corporate citizenship and philanthropy              | Business risk large projects                 |
| 4  | Corporate governance             | Controversial issues, dilemmas in lending/financing | Climate change governance                    |
| 5  | Customer relationship management | Financial inclusion/ capacity building              | Climate strategy                             |
| 6  | Innovation management            | Health Outcome Contribution                         | Electricity generation                       |
| 7  | Market Opportunities             | Human capital development                           | Environmental footprint                      |
| 8  | Marketing practices              | Labour practice indicators                          | Environmental policy/ management system      |
| 9  | Price risk management            | Social reporting                                    | Environmental reporting                      |
| 10 | Research and development         | Stakeholder engagement                              | Operational eco-efficiency                   |
| 11 | Risk and crisis management       | Standards for Suppliers                             | Transmission & Distribution                  |
| 12 | Stakeholder engagement           | Strategy to Improve Access to Drugs or Products     | Water-Related Risks                          |
| 13 | Scorecards/ Measurement Systems  | Talent Attraction & Retention                       |  |

### Liquidity

Liquidity is the ability of a company to meet its short-term debts with its current assets (Irawati, 2012). Liquidity can be measured using the Current Ratio with the following formula:

$$CR = \frac{CA_{it}}{CL_{it}}$$

Where: QR: Current Ratio; CA: Current assets; CL: Current liabilities; i = a company; t = year

### Stock Price Volatility

Stock price volatility is a measure of how much a stock price fluctuates or changes over a given period of time. Stock price volatility can be measured using the following formula proposed by (Baskin, n.d.) and (Ahmad, 2018):

$$P - VOL_{it} = \sqrt{\left(\frac{HP_{it} - LP_{it}}{2}\right)^2}$$

Where: P-Vol<sub>it</sub> serves as the stock price volatility for the firm, i stock price for the firm, HP means the highest stock price, while LP means the lowest stock price for the firm.

## RESULTS AND DISCUSSION

### Descriptive Statistics

Descriptive statistics are used to provide a general overview of the research data, including the minimum, maximum, mean, and standard deviation values of each variable used. In this study, the variables analyzed consisted of Corporate Sustainability Performance (CSP), Return on Equity (ROE), Liquidity, and Stock Price Volatility. As shown in Table 2, the minimum CSP value in this study sample is 0.53. This value indicates that there are companies that are only able to disclose around 53% of the total sustainability performance that should be disclosed. Meanwhile, the maximum value of CSP is 0.82, which means that there are companies that have disclosed up to 82% of the total expected sustainability performance indicators. The mean CSP value of 0.7070 shows that, in general, companies in this study have disclosed on average around 71% of the total sustainability performance that should be disclosed. The standard deviation value of 0.07894 indicates that the level of variation in CSP disclosure between companies in the study sample is relatively low.

As shown in Table 2, the minimum ROE value of -0.23 indicates that there are companies that suffer losses of up to 23% of their capital. Meanwhile, the

maximum ROE value of 0.44 indicates that there are companies that can generate a net profit of 44% of their total equity. The average ROE value is 0.1148 or around 11.48%, with a standard deviation of 0.14200, which shows a considerable variation in profitability between companies in the sample.

Table 2 shows that the minimum liquidity ratio value of 0.21 indicates that there are companies with current assets that are much smaller than their short-term liabilities, so they have the potential to experience difficulties in meeting short-term liabilities. On the other hand, a maximum value of 3.28 indicates that there are companies with current assets that are 3.28 times larger than their short-term liabilities. The average liquidity value of 1.5654 indicates that, in general, the companies in the sample are in a fairly liquid condition. Meanwhile, the standard deviation of 0.67790 indicates that there is a moderate to high level of liquidity variation between companies in the study sample.

As shown in Table 2, a minimum value of stock price volatility of 0.01 indicates that there are companies with very low or stable stock price fluctuations. Meanwhile, a maximum value of 0.12 indicates that there are companies that experience stock price fluctuations of up to 12% in one year. The average volatility value of 0.0490 or 4.90% indicates that, in general, the company experiences low to moderate stock price fluctuations. Meanwhile, the standard deviation of 0.02844 indicates that the variation in stock price fluctuations between companies is relatively small, or in other words, most companies show a level of volatility that is not much different.

Table 2. Descriptive Statistics Analysis

| Descriptive Statistics |    |         |         |        |                |
|------------------------|----|---------|---------|--------|----------------|
|                        | N  | Minimum | Maximum | Mean   | Std. Deviation |
| CSP                    | 60 | .53     | .82     | .7070  | .07894         |
| ROE                    | 60 | -.23    | .44     | .1148  | .14200         |
| LIKUIDITAS             | 60 | .21     | 3.28    | 1.5654 | .67790         |
| VOLATILITAS            | 60 | .01     | .12     | .0490  | .02844         |
| Valid N (listwise)     | 60 |         |         |        |                |

### Classical Assumption Test

#### Normality Test

As shown in Figure 2, the significance value (Asymp. Sig. 2-tailed) is 0.080. Because the significance value is  $0.080 > 0.05$ , it can be concluded that the residual regression model in this study is normally distributed.

#### Multicollinearity

As shown in Table 3, the tolerance value for the CSP variable is 0.886, and VIF is 1.128; the liquidity tolerance value is 0.788, the VIF value is 1.268, and the stock price volatility tolerance value is 0.744, and the VIF value is 1.343. The three variables had a tolerance value of  $> 0.10$  and a VIF value of  $< 10.00$ , so it can be concluded that there is no multicollinearity between the independent variable and the moderation variable.

#### Heteroscedasticity

As shown in Table 4, the CSP variable has a significance value of 0.634, the liquidity variable of 0.470, and the volatility variable of the stock price of 0.291. All three variables had a significance value greater than 0.05, which means that there was no significant relationship between independent and moderate variables with the residual absolute value. Thus, it can be concluded that this regression model is free from the symptoms of heteroscedasticity.

#### Autocorrelation

Table 5 shows that Durbin Watson's score is 1.441. Thus, the Durbin Watson value is in the interval between -2 and 2, so it can be ascertained that the multiple linear regression model has no symptoms of autocorrelation.

### One-Sample Kolmogorov-Smirnov Test

|                                  |                | Unstandardized Residual |
|----------------------------------|----------------|-------------------------|
| N                                |                | 60                      |
| Normal Parameters <sup>a,b</sup> | Mean           | .0000000                |
|                                  | Std. Deviation | .13310008               |
| Most Extreme Differences         | Absolute       | .108                    |
|                                  | Positive       | .108                    |
|                                  | Negative       | -.062                   |
| Test Statistic                   |                | .108                    |
| Asymp. Sig. (2-tailed)           |                | .080 <sup>c</sup>       |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Figure 2: Normality Test

Table 3. Multicollinearity Test

| Coefficients <sup>a</sup> |                             |            |                           |       |       |                         |
|---------------------------|-----------------------------|------------|---------------------------|-------|-------|-------------------------|
| Model                     | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  | Collinearity Statistics |
|                           | B                           | Std. Error |                           |       |       |                         |
| 1                         | (Constant)                  | .135       | .188                      | .721  | .474  |                         |
|                           | CSP                         | -.021      | .239                      | -.012 | .930  | .886                    |
|                           | M1                          | .035       | .030                      | .166  | 1.175 | .788                    |
|                           | M2                          | -1.223     | .725                      | -.245 | 1.687 | .744                    |

a. Dependent Variable: ROE

Table 4. Heteroscedasticity Test

| Coefficients <sup>a</sup> |             |                             |            |                           |      |
|---------------------------|-------------|-----------------------------|------------|---------------------------|------|
| Model                     |             | Unstandardized Coefficients |            | Standardized Coefficients | Sig. |
|                           |             | B                           | Std. Error | Beta                      |      |
| 1                         | (Constant)  | .095                        | .119       |                           | .799 |
|                           | CSP         | .002                        | .004       | .067                      | .479 |
|                           | LIKUIDITAS  | -.014                       | .019       | -.108                     | .470 |
|                           | VOLATILITAS | -.489                       | .459       | -.162                     | .291 |

a. Dependent Variable: ABS\_RES

Table 5. Autocorrelation Test

| Model Summary <sup>b</sup> |                   |          |                   |                            |               |
|----------------------------|-------------------|----------|-------------------|----------------------------|---------------|
| Model                      | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1                          | .349 <sup>a</sup> | .121     | .074              | .13662                     | 1.441         |

a. Predictors: (Constant), VOLATILITAS, CSP, LIKUIDITAS

b. Dependent Variable: ROE

## Hypothesis Testing

### Partial Test (T-Test)

The first hypothesis proposed in this study is that CSP significantly affects profitability. Based on Table 6, the corporate sustainability performance (CSP) variable has a significance value (Sig.) of 0.000, smaller than  $< 0.05$ . Thus, it can be concluded that CSP has a significant effect on Return on Equity (ROE). The value of the CSP coefficient of 0.005 indicates the direction of a positive influence, meaning that CSP has a positive and significant effect on profitability.

The moderate hypothesis of this study assumed that Liquidity moderate the effect of CSP on profitability. The result of the hypothesis testing in Table 7 shows that the interaction variable between Liquidity and CSP (XM1) has a significance value of 0.000, which is smaller than 0.05. This shows that Liquidity has been shown to moderate the influence of CSP on ROE. The value of the interaction coefficient of -0.128 indicates a negative influence direction.

The second moderate hypothesis of this study assumed that Stock Price Volatility moderates the effect of CSP on profitability. The result of the hypothesis testing in Table 8 shows that the interaction variable between Stock Price Volatility and CSP (XM2) has a significance value of 0.002, which is smaller than 0.05 with an interaction coefficient of 0.178. This shows that Stock Price Volatility has been shown to moderate the influence of CSP on ROE with a positive direction of influence.

Table 6. Partial Test Results (t-Test) Equation 1

| Coefficients <sup>a</sup> |            |                             |            |                           |        |
|---------------------------|------------|-----------------------------|------------|---------------------------|--------|
| Model                     |            | Unstandardized Coefficients |            | Standardized Coefficients | Sig.   |
|                           |            | B                           | Std. Error | Beta                      |        |
| 1                         | (Constant) | -.019                       | .019       |                           | -1.011 |
|                           | CSP        | .190                        | .027       | .678                      | 7.030  |

a. Dependent Variable: ROE

Table 7. Partial Test Results (t-Test) Equation 2

| Coefficients <sup>a</sup> |            |                             |            |                           |        |
|---------------------------|------------|-----------------------------|------------|---------------------------|--------|
| Model                     |            | Unstandardized Coefficients |            | Standardized Coefficients | Sig.   |
|                           |            | B                           | Std. Error | Beta                      |        |
| 1                         | (Constant) | -.167                       | .023       |                           | -7.191 |
|                           | CSP        | .401                        | .035       | 1.431                     | 11.511 |
|                           | LIKUIDITAS | .091                        | .011       | 2.778                     | 8.079  |
|                           | XM1        | -.128                       | .017       | -2.918                    | -7.665 |

a. Dependent Variable: ROE

Table 8. Partial Test Results (t-Test) Equation 3

| Coefficients <sup>a</sup> |             |                             |            |                           |        |
|---------------------------|-------------|-----------------------------|------------|---------------------------|--------|
| Model                     |             | Unstandardized Coefficients |            | Standardized Coefficients | Sig.   |
|                           |             | B                           | Std. Error | Beta                      |        |
| 1                         | (Constant)  | -1.888                      | .582       |                           | -3.245 |
|                           | CSP         | .535                        | .175       | 1.198                     | 3.051  |
|                           | VOLATILITAS | -.661                       | .182       | -3.628                    | -8.142 |
|                           | XM2         | .178                        | .055       | 7.852                     | 3.246  |

a. Dependent Variable: ROE

### F Test (Simultaneous Test)

As shown in Table 9, the results of the F test in the first equation showed an F value of 49.417 with a significance level (Sig.) of 0.000. This significance value is smaller than  $< 0.05$ , so it can be concluded that the first regression model, which only uses the Corporate Sustainability Performance (CSP) variable as a predictor, simultaneously significantly affects the dependent variable, namely Return on Equity (ROE).

As shown in Table 10, the results of the F test in the second equation showed an F value of 57,219 with a significance level (Sig.) of 0.000. This significance value is less than  $< 0.05$ , so it can be concluded that the second regression model involving the variables Corporate Sustainability Performance (CSP), Liquidity, and the interaction between CSP and Liquidity (XM1) simultaneously had a significant effect on Return on Equity (ROE). Thus, together the three variables in the second equation were shown to have a significant influence on profitability.

As shown in Table 11, the results of the F test in the third equation, an F value of 56.848 was obtained with a significance level (Sig.) of 0.000. This



significance value is smaller than  $< 0.05$ , so it can be concluded that the third regression model involving the variables Corporate Sustainability Performance (CSP), Stock Price Volatility, and the interaction between CSP and Volatility (XM2) simultaneously has a significant effect on Return on Equity (ROE). Thus, the three variables in the third equation together have been shown to significantly affect profitability.

Table 9. Results of Test F (Simultaneous Test) Equation 1

| ANOVA <sup>a</sup> |            |                |    |             |        |                   |
|--------------------|------------|----------------|----|-------------|--------|-------------------|
| Model              |            | Sum of Squares | df | Mean Square | F      | Sig.              |
| 1                  | Regression | .013           | 1  | .013        | 49.417 | .000 <sup>b</sup> |
|                    | Residual   | .016           | 58 | .000        |        |                   |
|                    | Total      | .029           | 59 |             |        |                   |

a. Dependent Variable: ROE

b. Predictors: (Constant), CSP

Table 10. Results of Test F (Simultaneous Test) Equation 2

| ANOVA <sup>a</sup> |            |                |    |             |        |                   |
|--------------------|------------|----------------|----|-------------|--------|-------------------|
| Model              |            | Sum of Squares | df | Mean Square | F      | Sig.              |
| 1                  | Regression | .022           | 3  | .007        | 57.219 | .000 <sup>b</sup> |
|                    | Residual   | .007           | 56 | .000        |        |                   |
|                    | Total      | .029           | 59 |             |        |                   |

a. Dependent Variable: ROE

b. Predictors: (Constant), XM1, CSP, LIKUIDITAS

Table 11. Results of Test F (Simultaneous Test) Equation 3

| ANOVA <sup>a</sup> |            |                |    |             |        |                   |
|--------------------|------------|----------------|----|-------------|--------|-------------------|
| Model              |            | Sum of Squares | df | Mean Square | F      | Sig.              |
| 1                  | Regression | .117           | 3  | .039        | 56.848 | .000 <sup>b</sup> |
|                    | Residual   | .038           | 56 | .001        |        |                   |
|                    | Total      | .155           | 59 |             |        |                   |

a. Dependent Variable: ROE

b. Predictors: (Constant), XM2, CSP, VOLATILITAS

### Coefficient of Determination Test (R<sup>2</sup>)

As shown in Table 12, based on the output of the Model Summary equation 1, the value of the determination coefficient (R<sup>2</sup>) is 0.460. This shows that 46% of the variation that occurs in the dependent variable ROE can be explained by the independent variable CSP. Meanwhile, the remaining 54% was explained by other factors that were not included in this study model.

As shown in Table 13, based on the output of the Model Summary of equation 2, the value of the

determination coefficient (R<sup>2</sup>) in equation 2 is 0.578. This means that the 57.8% variation in the dependent variable ROE can be explained by the independent variables CSP, Liquidity, and XM1 together. While the remaining 42.2% is explained by other variables outside the equation 2 model that were not studied in this study.

As shown in Table 14, based on the output of the Model Summary equation 3, the value of the determination coefficient (R<sup>2</sup>) in equation 3 is 0.753. This shows that 75.3% variation in the dependent variable ROE can be explained by the independent variables CSP, Stock price volatility, and XM2 together. Meanwhile, the remaining 24.7% is explained by other factors outside of equation model 3 that are not discussed in this study.

Table 12. Determination Coefficient Test Results (R<sup>2</sup>) Equation 1

| Model Summary |                   |          |                   |                            |
|---------------|-------------------|----------|-------------------|----------------------------|
| Model         | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1             | .678 <sup>a</sup> | .460     | .451              | .01638                     |

a. Predictors: (Constant), CSP

Table 13. Determination Coefficient Test Results (R<sup>2</sup>) Equation 2

| Model Summary |                   |          |                   |                            |
|---------------|-------------------|----------|-------------------|----------------------------|
| Model         | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1             | .760 <sup>a</sup> | .578     | .555              | .03316                     |

a. Predictors: (Constant), XM1, CSP, LIKUIDITAS

Table 14. Determination Coefficient Test Results (R<sup>2</sup>) Equation 3

| Model Summary |                   |          |                   |                            |
|---------------|-------------------|----------|-------------------|----------------------------|
| Model         | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1             | .868 <sup>a</sup> | .753     | .740              | .02619                     |

a. Predictors: (Constant), XM2, CSP, VOLATILITAS

### CONCLUSION

This study shows that Corporate Sustainability Performance (CSP) has a significant positive effect on profitability as measured through Return on Equity (ROE). This shows that the better the disclosure and implementation of economic, social, and environmental responsibilities, the higher the company's ability to generate profits for shareholders.

Liquidity has been shown to moderate the relationship between CSP and ROE with a significant negative influence. The lower the liquidity, the positive influence of CSP on profitability tends to decrease. This is because during the COVID-19 period, the demand for mining company products tended to decrease, resulting in a decrease in the company's profitability. So that the company is unable to pay its short-term obligations, which ultimately has an impact on reduced corporate sustainability performance activities, and this also affects the company's image, resulting in a decrease in profitability. Maintained liquidity provides financial space for companies to support sustainability programs without disrupting short-term operational stability.

Lastly, Stock Price volatility has also been shown to moderate the influence of CSP on ROE with a significant positive influence. Good sustainability practices can increase investor confidence and strengthen the company's resilience in the midst of market fluctuations, so that reasonable stock price volatility can be used to create opportunities to increase profitability through effective risk management, good reputation, and more stable access to funding.

Therefore, the study suggests that Companies are advised to continuously improve the quality and scope of sustainability programs (CSPs), especially on environmental and social aspects, so that they can provide a positive image, improve reputation, and have a direct impact on long-term profitability. For future researchers, it is expected to develop this research by taking into account longer time periods, different sub-sectors, as well as other relevant control variables, such as leverage, company size, or macroeconomic factors.

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