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IMPROVING CORPORATE SUSTAINABILITY THROUGH IMPLEMENTING GREEN ACCOUNTING AND MATERIAL FLOW COST ACCOUNTING

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Abstract

This study aims to analyse how the implementation of green accounting and material flow cost accounting (MFCA) can enhance corporate sustainability in mining companies listed on the Indonesian Sharia Stock Index (ISSI). Green accounting is measured through the PROPER program, while MFCA is proxied by factory area and production output. The study uses a quantitative approach and purposive sampling from companies listed on the ISSI for the 2021-2023 period. The results show that green accounting does not have a significant effect on improving corporate sustainability. MFCA, measured by factory area, shows no significant relationship in improving corporate sustainability. In contrast, MFCA, proxied by production output, has a significant positive effect on corporate sustainability. Meanwhile, green accounting and MFCA have a substantial impact on improving corporate sustainability. The study's results indicate that the simultaneous approach is more effective at supporting sustainability. The synergy between green accounting and MFCA helps companies formulate sustainable business strategies by

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ensuring compliance, thereby driving innovation and competitive advantage through transparency, environmental accountability, resource efficiency, and waste reduction.

Keywords: *Corporate Sustainability, Green Accounting, Material Flow Cost Accounting*

1. Introduction

The era of globalisation is forcing companies to adopt a new paradigm in conducting business: profit-making must go hand in hand with the obligation to adopt an environmentally friendly operational model (Madyasari & Yuliani, 2023). These environmental concerns are also a key focus for companies operating in the mining sector. Mining companies provide essential energy resources for a country's economic growth (Dewata et al., 2018). Although the mining sector shows strong prospects, as evidenced by the rising export volumes of oil and coal products in 2021-2023 (BPS, 2024), the urgency of sustainable mining practices cannot be ignored. While mining brings economic opportunities, it also poses significant environmental challenges. A company's sustainability is determined not only by its financial performance but also by its social and ecological impacts (Werastuti et al., 2023).

These impacts include pollution that spreads to local communities from the use of surrounding natural resources for daily needs, such as clean water and food. Communities experience declines in quality of life and health due to exposure to heavy metal pollution, including copper and arsenic, which can trigger various health problems (Laoye et al., 2025). Beyond health concerns, the social impacts of pollution are also evident in increasing tensions between companies and local communities. Public dissatisfaction with environmentally damaging corporate practices often leads to protests and conflict, disrupting company operations and damaging their reputations (Werastuti et al., 2023). The government has launched the Corporate Performance Rating Assessment Program (PROPER), a regulation to monitor and encourage more responsible and sustainable corporate environmental management.

One Indonesian company that has neglected environmental impacts on health, social, and external costs is PT: BA, a coal mining company (Juniah et al., 2013). Based on data from its sustainability report, the company has allocated environmental costs, as evidenced by its highest PROPER rating from the Ministry of Environment and Forestry (KLHK) over the past three years. However, this has also increased annual environmental costs, thereby reducing profits and potentially jeopardising the company's sustainability. This contrasts with PT. EMP's three-year environmental cost allocation has shown varying but consistently improving PROPER ratings. This is accompanied by increasing company profits, demonstrating stable corporate sustainability. The inconsistencies and

discrepancies between theory and empirical facts have prompted an in-depth study of the main sustainability challenges in the mining sector.

Several previous studies using the same indicators and measurement methods have found that green accounting does not affect sustainable development, as reported by May et al. (2023) and Faizah (2020). However, Prasetyowati (2023) stated that green accounting has a significant adverse effect. Environmental costs may adversely affect a company, with effects that may not be immediately apparent during the reporting period but may manifest in subsequent years. Previous research conducted by Selpiyanti & Fakhroni (2020) and Prasetyowati (2023) found that MFCA had a positive and significant impact on improving sustainable development. Meanwhile, findings by Pramesti & Wahyuni (2023) and Rakesa & Werastuti (2022) indicate that green accounting and MFCA each influence corporate sustainability. Meanwhile, the simultaneous influence of green accounting and MFCA on corporate sustainability was examined by Yuniar et al. (2024) and Khotimah (2022).

A study by Abdullah & Amiruddin (2020) found that companies that implemented green accounting improved their public image and, in turn, product sales. With this data, researchers strengthen the argument that effective environmental management not only benefits the environment but also enhances the company's economic sustainability. Furthermore, Werastuti et al. (2023) explicitly recommend that future researchers extend their work by examining other companies that contribute to greater environmental pollution, such as mining companies. Based on the background and urgency outlined above, this study aims to analyse the influence of these two environmental accounting concepts on sustainability in different objects, namely mining companies registered with the International Society for Sustainable Development (ISSI), and to address this gap.

The findings are expected to bridge the gap between theory and practice, enabling the integration of sustainability principles into business strategies. Theory suggests that increased implementation of green accounting and MFCA improves corporate sustainability (Khotimah, 2022). In contrast, empirical data indicate that some companies have allocated environmental costs but have experienced surges that threaten corporate sustainability. The implementation of this research's findings is expected to create synergies across economic, social, and environmental dimensions while ensuring regulatory compliance, encouraging innovation, and strengthening the competitive advantage and reputation of mining companies among stakeholders.

2. Literature Review

2.1 Green Accounting for Corporate Sustainability

Green accounting is a branch of accounting that identifies costs associated with environmental conservation (Selpiyanti & Fakhroni, 2020). In this context, green

accounting helps organisations develop strategies to address environmental issues in their stakeholder relationships (Pitriani, 2022). The application of green accounting prioritises the efficiency and effectiveness of resource use to balance corporate sustainability with benefits to the surrounding community (Loen, 2019). This means that companies strive to achieve economic benefits while maintaining their environmental responsibilities (Tripalupi et al., 2024). To assess a company's performance in responsible environmental management, the PROPER program from the Ministry of Environment (KLH) uses a colour rating converted to a numerical scale of 1 to 5 (Utami et al., 2025).

A company's survival depends on its profits (Khotimah, 2022). By operating a business and adopting sustainable practices, companies can preserve natural resources and ensure their long-term viability (Setiawan, 2023). The concept of corporate sustainability is closely related to three principles: economic, environmental, and social (Tripalupi et al., 2024). Several previous studies have revealed the relationship between green accounting and corporate sustainability. Research by May et al. (2023) and Faizah (2020) indicates that green accounting does not affect sustainable development. However, Prasetyowati (2023) states that green accounting has a significant adverse effect. Environmental costs may adversely affect a company, with effects that may not be immediately apparent during the reporting period but may manifest in subsequent years.

Research by Pramesti & Wahyuni (2023) and Rakesa & Werastuti (2022) indicates that green accounting impacts corporate sustainability. Similarly, a study by Abdullah & Amiruddin (2020) showed that companies implementing green accounting experienced improvements in public image and, in turn, product sales. Studi Angelin & Ulfah (2024) di perusahaan barang dan konsumsi yang tercatat di IDX menemukan bahwa akuntansi hijau tidak dapat memoderasi pengaruh akuntansi biaya aliran material terhadap keberlanjutan perusahaan. With this data, researchers strengthen the argument that effective environmental management not only benefits the environment but also enhances the company's economic sustainability. Based on previous studies, the first hypothesis can be formulated.

H_1: Green accounting has a significant influence on corporate sustainability.

2.2 Material Flow Cost Accounting for Corporate Sustainability

Material flow cost accounting (MFCA) can affect profit and productivity growth by optimising production costs, thereby minimising waste generated by a company's production activities (Selpiyanti & Fakhroni, 2020). Companies incur various environmental costs for reasons such as the remediation and mitigation of ecological damage and pollution resulting from their activities (Mubarokah et al., 2024). MFCA measurements using area data help companies facilitate strategic decision-making and improve operational efficiency by reducing waste and pollution, which impact corporate

sustainability. In terms of production outcomes, MFCA is a key tool explicitly designed to manage the flow of materials, energy, and data, thereby improving the efficiency and sustainability of the manufacturing process and production outcomes for the company (Ambarita & Kartika, 2015).

Several previous studies have revealed a relationship between MFCA and corporate sustainability. Earlier research by Selpiyanti & Fakhroni (2020) and Prasetyowati (2023) found that material flow cost accounting has a positive and significant effect on sustainable development. Findings by Pramesti & Wahyuni (2023) and Rakesa & Werastuti (2022) indicate that MFCA influences corporate sustainability. Meanwhile, Julianitasari's (2023) findings suggest that MFCA does not affect corporate sustainability. A study by Angelin & Ulfah (2024) found that MFCA, measured by factory area and output or production value, had a positive and significant effect on company sustainability, confirming that the wider the operational scope and the higher the production results, the greater the company's potential for sustainability. Based on the above study, the second hypothesis is formulated as Ha2: MFCA, proxied by factory area, has a significant effect on corporate sustainability. The third hypothesis is formulated accordingly.

H_2: MFCA, proxied by production results, has a substantial impact on corporate sustainability.

2.3 Green Accounting and Material Flow Cost Accounting for Corporate Sustainability

Company managers can implement green accounting and material-flow cost accounting to improve the company's economic performance (Prasetyowati, 2023). The following research findings reveal that green accounting and MFCA simultaneously impact corporate sustainability (Yuniar et al., 2024; Khotimah, 2022). As a result of this study, the fourth hypothesis (Ha4) emerged: green accounting and MFCA, proxied by factory area and production outcomes, simultaneously have a significant effect on corporate sustainability.

H_3: Green Accounting and Material Flow Cost Accounting have an influence on Corporate Sustainability

3. Research Methods

The study employed a descriptive, quantitative approach (Sugiyono, 2021). The study population comprised mining companies in the oil, gas, and coal subsector registered with the ISSI during the 2021-2023 period, totalling 51. A purposive sampling technique was used, yielding 14 companies that disclosed their PROPER rating achievements over a three-year study period and 42 data points for analysis. A review of annual reports and sustainability reports published by the companies and published on their official websites served as secondary data sources.

The research stages involved first conducting a literature review of relevant theoretical sources and previous research, as well as initial empirical data. Then the research problem was formulated. The next company data was collected and analysed using descriptive statistics, classical assumption testing, multiple linear regression, coefficient of determination (R2), and hypothesis testing.

Table 1. Operational Variables

Variables	Indicator	Measurement	Scale
Green accounting	Environmentally Friendly Products (PROPER Rating)	(1) Gold = 5; (2) Green = 4; (3) Blue = 3; (4) Red = 2; (5) Black = 1	Ordinal
MFCA1	Industrial Factory Area	Number of Hectares of Factory Area	Ratio
MFCA2	Production result	Cost of goods sold	Ratio
Corporate sustainability	1. Economics: Net profit 2. Environment: Utility costs or environmental management costs 3. Social: Salary and severance pay costs	Corporate sustainability = Economic + Environmental + Social	Ratio

Source: Utami et al (2025); Ambarita & Kartika (2015); WCED (1987); processed

4. Results and Discussion

4.1 Result

4.1.1 Descriptive Statistical Test

The results of statistical processing of the research variables green accounting (GA) and material flow cost accounting, proxied by area (MFCA1) and by production results (MFCA2), respectively, as independent variables, and corporate sustainability as the dependent variable, are presented as follows.

Table 2. Descriptive Statistics Results

	N	Minimum	Maximum	Mean	Standard Deviation
GA	42	3	5	3.79	.750
MFCA1	42	1554	9063	5593.98	1900.521
MFCA2	42	26055	31746	29709.36	1552,468
CS	42	27190	32769	30529.19	1494.084
Valid N (listwise)	42				

Source: SPSS 29 output, processed (2024)

The number of data points (N) used in this study is 42 samples from mining-sector companies listed on the ISSI during the 2021-2023 period. The results of the analysis using descriptive statistics can be described as follows: (1) The results of descriptive statistics on green accounting (GA) as measured by the acquisition of PROPER ratings 1-5. The table shows that the minimum value of 3 was obtained from some companies at the beginning of the research period, namely 2021. The maximum value was 5 (ADRO and PTBO). The mean value was 3.79, and the standard deviation was 0.750; (2) The results of descriptive statistics of MFCA, which was proxied by the area using LN (Natural logarithm). The table shows the minimum value of 1554 (MCOL 2021), the maximum value of 9063 (ADRO 2023), the mean value of 5593.98 and the standard deviation of 1900.521; (3) The descriptive statistical results of MFCA proxied by production results using LN (Natural logarithm) show a minimum value of 26055 (TEBE 2021), a maximum value of 31746 (ADRO 2023), a mean value of 29709.36 and a standard deviation of 1552.468; (4) The descriptive statistical results of corporate sustainability using LN (Natural logarithm) show a minimum value of 27190 (TEBE 2021), a maximum value of 32769 (ADRO 2022), a mean value of 30529.19 and a standard deviation of 1494.084.

4.1.2 Normality Test

Researchers conducted tests using histograms, regular probability plot graphs (Normal P-Plot), and non-parametric statistical tests, namely the Kolmogorov-Smirnov test.

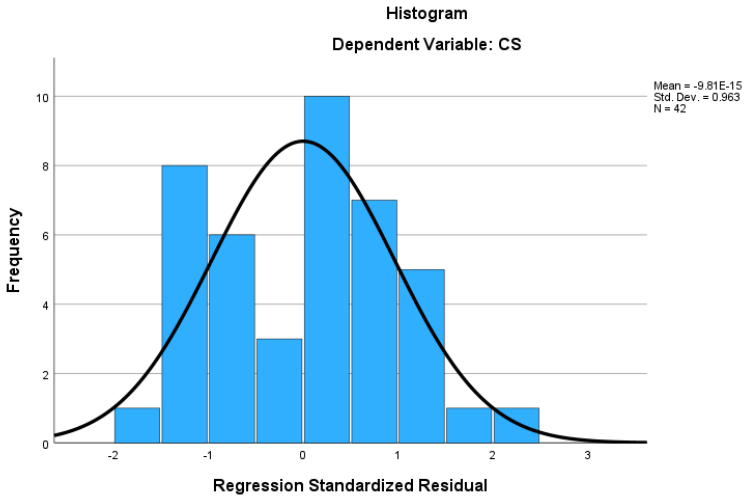

Figure 1. Results of Normality Test with Histogram

Source: SPSS 29 output, processed (2024)

Based on Figure 1 of the normality test above, the histogram appears approximately bell-shaped, indicating that the residuals are approximately normal.

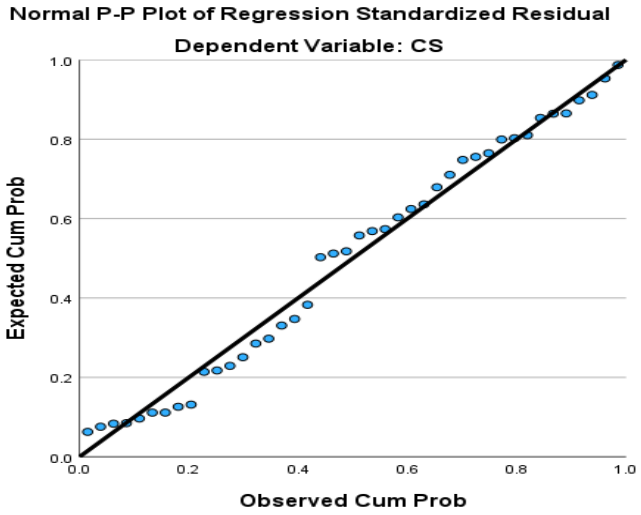

Figure 2. Results of Normality Test with Normal P-Plot Graph

Source: SPSS 29 output, processed (2024)

Based on Figure 2, the normality test indicates that the P-Plot shows the blue dots aligning with the diagonal line, suggesting that the standard residuals are approximately normal.

Table 3. Results of the Normality Test with Kolmogorov-Smirnov

Asymp. Sig. (2-tailed)c		.200d
Monte Carlo Sig. (2-tailed)e	Sig.	.490

Source: SPSS 29 output, processed (2024)

Based on the results of the Kolmogorov-Smirnov test, because the p-value is greater than 0.05 (both the asymptotic test (0.200) and the Monte Carlo test (0.490)), the residuals appear to come from a normal distribution.

4.1.3 Multicollinearity Test

Table 4. Multicollinearity Test Results

Coefficientsa

Model	Tolerance	VIF
1 GA	.672	1,487
MFCA1	.889	1,124
MFCA2	.611	1,636

Source: SPSS 29 output, processed (2024)

Based on Table 4, the multicollinearity test indicates that the tolerance value for the independent variable green accounting (MFCA, proxied by area and production results) exceeds 0.01. Then, the VIF value for the independent variable green accounting, MFCA, which is proxied by area and production results, shows a VIF value of more than 0.10 and less than 10. Thus, this regression model does not exhibit serious multicollinearity.

4.1.4 Heteroscedasticity

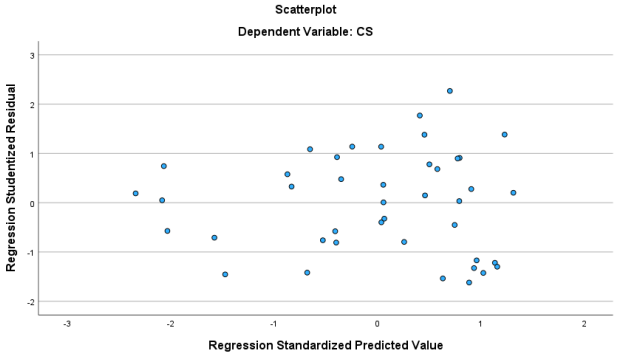

Figure 3. Results of Heteroscedasticity Test with Scatterplot Diagram

Source: SPSS 29 output, processed (2024)

Based on Figure 3, the heteroscedasticity test indicates that the points in the scatterplot are dispersed and do not form a clear pattern. Therefore, the model does not exhibit heteroscedasticity.

4.1.5 Autocorrelation Test

Table 5. Results of Autocorrelation Test with Durbin-Watson

Model Summary					
Model	R	R Square	Adjusted R	Standard Error of the Estimate	Durbin-Watson
1	.973a	.948	.944	354,946	1,331

a. Predictors: (Constant), MFCA2, MCFA1, GA

b. Dependent Variable: CS

Source: SPSS 29 output, processed (2024)

The criteria for determining the presence or absence of autocorrelation symptoms are determined by looking at the Durbin-Watson value. If the DW statistic is between -2 and +2, there is no autocorrelation problem. Based on Table 4.3, the Durbin-Watson statistic is 1.331, which falls between 1.0 and 2.0, indicating no autocorrelation.

4.1.6 Multiple Regression Test

Table 6. Results of Multiple Linear Regression Analysis

Coefficientsa						
		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	2884,562	1151,576		2,505	.017
	GA	57,325	90,121	.029	.636	.529
	MFCA1	-.012	.031	-.016	-.395	.695
	MFCA2	.925	.046	.962	20,264	<,001

Source: SPSS 29 output, processed (2024)

Based on Table 6, the regression equation can be obtained in this study, namely:

$$Y = \alpha + \beta1\ X1 + \beta2\ X2 + \beta3\ X3 + e$$

$$Y = 2884.562 + 57.325\ GA + (-0.012)\ MFCA1 + 0.925\ MCFA2$$

Information:

Y = Corporate Sustainability
α = Constant
GA = Green Accounting
MFCA1 = Material Flow Cost Accounting proxied by Area
MFCA2 = Material Flow Cost Accounting proxied by Production Results
Y = Corporate Sustainability
e = Error rate

The constant α of 2884.562 indicates that if all independent variables, namely GA, MFCA1, and MFCA2, are zero, then the value of the dependent variable Y is estimated to be 2884.562. The coefficient on the green accounting (GA) variable of 57.325 indicates that every 1 unit increase in GA will increase the value of Y by 57.325, assuming that other independent variables remain constant. The MFCA coefficient proxied by the area (MFCA1) of (-0.012) indicates that every 1 unit increase in the MFCA1 variable will decrease the value of Y by (-0.012), assuming that other variables remain constant. The MFCA coefficient proxied by production results (MFCA2) of 0.925 indicates that every 1 unit increase in the MFCA2 variable will increase the value of Y by 0.925, assuming that other variables remain constant.

4.1.7 Coefficient of Determination Test (R2)

Table 7. Results of the Determination Coefficient Test (R2))

Model Summary				
Model	R	R Square	Adjusted R-Square	Standard Error of the Estimate
1	.973a	.948	.944	354,946

Source: SPSS 29 output, processed (2024)

Based on the coefficient of determination test in Table 7, the Adjusted R-Square value is 0.944, or 94.4%. This means that, in this study, the dependent variable, corporate sustainability, is influenced by the independent variables green accounting and MFCA, proxied by area and production yield, respectively, to the extent of 94.4%. The remaining 5.6% is influenced by other independent variables not examined in this study.

4.1.8 Hypothesis Testing

Based on Table 7, the following research results were obtained:

t count = 0.636
ttable = t (/ a/2; nk-1)
= t (0.05 / 2 ; 42 – 3 – 1)
= t (0.025 ; 38)

ttable = 2.02439

Description: a = 0.05, n = number of data, (42) k = number of independent variables (3).

The t-test results for the Green Accounting (GA) variable show a t-value of 0.636 and a Sig. of 0.529. This means that Tcount < Ttable, with a Sig. When the p-value exceeds 0.05, the null hypothesis (H0) cannot be rejected. This means that green accounting does not affect corporate sustainability. In Table 7, the MCFA1 variable (factory area) has a t-value of -0.395 with a Sig. of 0.695. This means that Tcount < Ttable, and the Sig. The p-value exceeds 0.05, so the null hypothesis (H0) cannot be rejected. This means that the MCFA1 variable (factory area) does not affect corporate sustainability. Therefore, the alternative hypothesis (Ha2) is rejected. The results of the t-test in Table 7 indicate that the MCFA2 variable (production results) has a t-value of 20.264 (Sig.). < 0.001. This means that Thitung > Ttabel, in addition to the Sig. The value is much smaller than 0.05; the null hypothesis (Ho3) is rejected. This means that the MCFA2 variable (production results) significantly influences corporate sustainability. Therefore, the alternative hypothesis (Ha3) is accepted.

Table 8. F Test Results

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	86736306.462	3	28912102.154	229,486	<,001b
Residual	4787480.015	38	125986.316		
Total	91523786.476	41			

Source: processed secondary data, 2024

Table 8 reports a p-value <0.001, indicating that the result is statistically significant at the 0.05 level. Then, the results of the comparison of the F count with the F table are as follows:

F count = 229.486

Ftable = F (k ; n – k)

= F (3 ; 42 – 3)

= F (3 ; 39)

Ftable = 2.85

Description: a = 0.05; n = number of data (42); k = number of independent variables (3).

This means that F count > F table, in addition, the sig. The p-value is well below 0.05; therefore, the test rejects Ho4 and accepts Ha4. Thus, it can be inferred that the independent variables of green accounting, MFCA proxied by area, and MFCA proxied by production results jointly affect the dependent variable, corporate sustainability.

4.2 Discussion

4.2.1 Green Accounting in Improving Corporate Sustainability

In this study, green accounting was measured using the PROPER index, which evaluates a company's compliance with environmental regulations. However, the analysis showed that green accounting had no significant effect on corporate sustainability (p = 0.529;>0.05). This result aligns with research by May et al. (2023), Faizah (2020), and Khotimah (2022), which found no significant effect of green accounting on corporate sustainability. Furthermore, this finding contradicts Prasetyowati's (2023) theory, which posits that green accounting has a substantial adverse impact on corporate sustainability. This result also differs from the findings reported by Pramesti & Wahyuni (2023), Rakesa & Werastuti (2022), and Angelin & Ulfah (2024). This indicates that, although companies invest in environmental management, the impact on corporate sustainability is not immediately visible. One factor is that improved reputation or stakeholder support resulting from good environmental management may take longer to translate into measurable economic, social, and ecological sustainability (Khotimah, 2022). Environmental accounting can also indicate direct positive impacts on sustainability through other channels. While implementing environmental accounting requires an initial investment, it yields significant long-term benefits, including operational efficiency, improved reputation, and regulatory compliance. The widespread adoption of environmental accounting is a strategy for optimising actual and potential investments, building a stronger foundation for corporate sustainability (Burritt & Christ, 2016).

4.2.2 Material Flow Cost Accounting Proxied by Area in Improving Corporate Sustainability

The analysis results show that factory area does not significantly influence corporate sustainability, with a coefficient of -0.012 and a p-value of 0.695 (>0.05). These results indicate that factory area as an indicator of physical capacity is insufficient to explain corporate sustainability. The large factory area indicates only potential production capacity and does not reflect operational efficiency or the impact on social pillars, governance, or the company as a whole. This is consistent with Abdullah & Amiruddin's (2020) research and Angelin & Ulfah's (2024). The findings contradict the theories of Selpiyanti & Fakhroni (2020) and Khotimah (2022). This difference may be due to the novelty of the research object compared with previous studies—namely, mining companies in the oil, gas, and coal subsector—and to the more recent period of 2021-2023. Factory area doesn't always directly correlate with the social and economic dimensions of corporate sustainability. The social dimension, such as a company's relationship with the community, is more related to corporate social responsibility (CSR) programs and environmental impact management. Meanwhile, the economic dimension is more related

to production efficiency and cost management than area size (Abdullah & Amiruddin, 2020).

4.2.3 Material Flow Cost Accounting Proxied by Production Results to Improve Corporate Sustainability

MFCA, proxied by production output, has a significant positive effect on corporate sustainability, with a coefficient of 0.925 and a p-value < 0.001 (<0.05). These results indicate that production efficiency is crucial to supporting corporate sustainability. This finding aligns with the theories proposed by Selpiyanti & Fakhroni (2020) and Khotimah (2022); Angelin & Ulfah (2024), which suggest that implementing MFCA, proxied by production output, can reduce waste and increase productivity, thereby lowering unit costs and ultimately increasing profit margins. This also confirms that companies that successfully expand their operations and increase their production tend to have higher sustainability potential. Optimal production results indicate more efficient resource use, thereby reducing emissions and waste. In the mining sector, where energy and material use are significant, operational efficiency can have a considerable positive impact on the environment. This aligns with prior research indicating that MFCA can help companies reduce negative environmental impacts while improving operational efficiency (Selpiyanti & Fakhroni, 2020). However, these results contradict several previous studies, including Julianitasari (2023), owing to differences in research objectives. Manufacturing company sustainability is achieved through balanced resource management and MFCA, not simply pursuing production targets.

4.2.4 Green Accounting and Material Flow Cost Accounting Proxied by Factory Area and Production Results in Improving Corporate Sustainability

This study shows that green accounting and MFCA exert a significant influence on corporate sustainability. This is evidenced by the F-test results, in which the calculated F-value exceeds the critical value in the F-table and the p-value is <0.05. These results are consistent with those reported in most studies, including Yuniar et al. (2024), Werastuti et al. (2023), and Khotimah (2022). The results of this study indicate that, by collectively being more effective in supporting sustainability—i.e., managing environmental costs while increasing material and operational efficiency (MFCA)—companies can create synergies that positively impact corporate sustainability. Green accounting, MFCA proxied by area, and production yield collectively explained 94.4% of corporate sustainability, with the remaining 5.6% attributable to factors outside the study. This model performed well in predicting corporate sustainability levels using data from these three variables. This study offers novelty in its research object, namely, mining companies in the oil, gas, and coal subsector, examined over a more recent period. The survey results indicate that, together, green accounting, MFCA, proxied by area and production results,

and corporate sustainability influence mining companies registered with ISSI. Thus, corporate sustainability can be improved through the implementation of green accounting and MFCA proxied by area and production results. The synergy between green accounting and MFCA helps companies formulate sustainable business strategies by ensuring compliance, thereby driving innovation and competitive advantage through transparency, environmental accountability, resource efficiency, and waste reduction (Tajelawi & Garbharran, 2015).

5. Conclusion

The analysis of the research data concluded that partially green accounting did not significantly improve corporate sustainability. In part, the factory area used as a proxy for MFCA had no significant effect on corporate sustainability. In part, MFCA, proxied by production results, showed a significant positive influence on corporate sustainability. Simultaneously, green accounting and MFCA, as proxied by area and production outcomes, had a significant influence on corporate sustainability. The combination of green accounting, which shows a commitment to environmental management, and MFCA, which focuses on operational efficiency, creates a synergy that supports corporate sustainability.

The research findings simultaneously demonstrate greater effectiveness in supporting sustainability. The synergy between green accounting and MFCA can help companies formulate sustainable business strategies by implementing compliance that can drive innovation and competitive advantage through transparency, environmental accountability, resource efficiency, and waste reduction. This study has limitations in using the PROPER index as a green accounting indicator, in measuring MFCA based on factory area, and in its limited sector coverage. Therefore, future research in this area should explore additional relevant indicators, use primary data, and expand cross-sectoral studies to support sustainability comprehensively.

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