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The Role of Green Accounting in Enhancing Sustainability Practices in MSMEs in Semarang, Indonesia: Financial Performance Analysis Using the PLS-SEM Approach

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ABSTRACT

This study investigates the effect of adopting green accounting on sustainability performance and financial performance of micro, small, and medium enterprises (MSMEs) in Semarang, Indonesia. Data from 90 MSMEs across three categories—micro, small, and medium— were examined using structural equation modeling with partial least squares (PLS-SEM). The results show that adopting green accounting significantly improves sustainability performance (β = 0.76), indicating that implementing green accounting practices leads to better environmental, social, and economic outcomes. Additionally, sustainability performance positively affects financial performance (β = 0.27), demonstrating that sustainable practices lead to better profitability through cost efficiency, customer loyalty, and market access. While green accounting adoption also directly impacts financial performance (β = 0.39), the majority of its effect is mediated through sustainability performance. The bootstrapped mediation analysis confirms that sustainability performance fully discusses the connection between financial performance and the implementation of green accounting (Indirect effect = 0.21, p = 0.020). Additionally, 35% of the effect on financial performance is explained by sustainability practices. The study highlights that adopters of green accounting show significantly improved performance, particularly in medium-sized enterprises, where the t-value for sustainability performance was 7.33. These results contribute to the literature by demonstrating that green accounting not only supports environmental sustainability but also enhances financial performance. The results of the study are especially pertinent to policymakers and MSME practitioners in Semarang, providing insights into the importance of green accounting in improving business outcomes.

Keywords: Green accounting, sustainability performance, financial performance, MSMEs.

INTRODUCTION

In Indonesia, micro, small, and medium-sized businesses, or MSMEs, are essential to the country's economy more than 60% to GDP and providing employment for 97% of the workforce. In Semarang, MSMEs not only support the local economy but also play a pivotal role in job creation. However, despite their substantial contributions, MSMEs in Semarang encounter growing challenges, especially concerning environmental issues, which frequently jeopardize their operational sustainability.

Semarang, as a coastal city in northern Java, faces significant threats from tidal flooding and climate change. According to data from the Meteorology, Climatology, and Geophysics Agency (BMKG), tidal flooding in Semarang has increased by over 40% in the last decade, damaging facilities, disrupting supply chains, and halting business operations in some cases.

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Sectors such as batik and food processing, which are heavily reliant on local resources, are particularly vulnerable to this phenomenon, resulting in substantial financial losses. Additionally, climate change, which causes extreme weather events and erratic rainfall patterns, further exacerbates the vulnerability of these sectors by disrupting raw material supply chains and increasing production costs.

Furthermore, global climate change has caused unpredictable weather patterns, extreme temperatures, and irregular rainfall, all of which adversely impact the quality of raw materials and disrupt the production processes of MSMEs. For instance, the agriculture and fisheries sectors, which dominate MSMEs in Semarang, are increasingly threatened by declining crop yields and damage to aquatic ecosystems. These disruptions lead to higher production costs and decreased profits.

Given these pressing challenges, there is an urgent need for MSMEs to adopt sustainable practices that can mitigate the environmental impact of their operations. One such solution is the adoption of including environmental costs in financial reporting is known as "green accounting", allowing businesses to be more mindful of their social and environmental impacts. By adopting this approach, MSMEs can better identify and manage resource usage, waste management, and energy consumption, while also measuring the efficiency of raw material use.

However, despite the considerable potential of green accounting to help MSMEs manage environmental impacts and improve sustainability performance, many MSMEs in Semarang face significant barriers in implementing and utilizing green accounting systems. These barriers include lack of understanding of how to integrate environmental factors into their financial systems, coupled with limited resources and training on the application of such accounting practices.

Therefore, this study aims to investigate Green accounting's contribution to improving sustainability practices and financial performance among MSMEs in Semarang. This research will also explore the factors driving the adoption of green accounting and examine how its implementation can reduce environmental impacts while boosting operational efficiency and profitability for MSMEs.

LITERATUR REVIEW

Green Accounting

An accounting method known as "green accounting" integrates environmental expenses into a business's financial reporting, enabling the measurement, recording, and revelation of how business operations affect the environment. According to Gray (2010), green accounting assists companies in accounting for environmental costs, encompassing the use of environmentally acceptable raw materials, waste management, and energy usage. This approach enables businesses to assess the effects of their choices on the environment and society, which subsequently influences their sustainability performance.

A study by Indriastuti & Mutamimah (2023) shows that MSMEs adopting green accounting have experienced reduced operational costs, such as waste reduction and energy savings, which significantly contribute to the improvement of their financial performance. However, the adoption of green accounting among MSMEs remains limited, mainly due to a lack of knowledge and implementation challenges, particularly in regions with limited resources and technical support.

Sustainability and Sustainability Practices in MSMEs

Sustainability is the responsible management of resources to satisfy current needs while ensuring that future generations can also meet their needs. This concept is commonly represented by the Triple Bottom Line (TBL) framework, introduced by Elkington (1997). TBL measures a company's performance not only in terms of profits but also through its social and environmental impacts. By adopting TBL principles, MSMEs can enhance their business sustainability by considering economic, social, and environmental aspects in their operations.

Sustainability practices in MSMEs in Semarang, waste minimization, energy conservation, and the utilization of environmentally friendly products are a few examples, not only improve environmental performance but also bring economic benefits by reducing production costs, enhancing corporate reputation, and accessing wider markets. A study by Indriastuti & Mutamimah

(2023) confirms that MSMEs integrating sustainability principles into their operations have seen significant improvements in their financial performance.

Stakeholder Theory

Stakeholder theory, as presented by Freeman (1984), emphasizes that businesses should consider the interests of everyone who may be impacted by their operations, including customers, employees, investors, and society. This aligns with the adoption of green accounting, which allows businesses to be more transparent in managing their social and environmental impacts. Increased transparency and social responsibility build trust with external stakeholders, such as consumers, investors, government, and local communities. For MSMEs, this can lead to enhanced corporate image and competitive advantage.

Legitimacy Theory

Legitimacy theory asserts that organizations must function in compliance with the prevalent social norms and ideals that society deems acceptable. According to Suchman (1995), businesses that conform their activities to the norms of society and pay attention to their social and environmental responsibilities gain legitimacy, which is crucial for long-term success. For MSMEs in Semarang, adopting green accounting and sustainable practices can help them gain legitimacy from stakeholders and society, ensuring the sustainability of their business in the long run.

Research Gap and Novelty

Empirical studies on green accounting in Indonesia are still relatively limited, mostly focusing on large companies, specific industries (batik, fashion), or qualitative approaches. Indriastuti & Mutamimah (2023) analyzed 405 MSMEs in Central Java using PLS-SEM and found that financial performance mediates green accounting's impact on sustainability performance. Other studies in Madura focus on environmental cost allocation in the batik industry, while research in Bekasi highlights green accounting knowledge and its impact on financial reporting quality. As of yet, no research has explicitly looked at the structural relationship between green accounting adoption, sustainability performance, and financial performance in Semarang's MSMEs, considering the differences in categories (micro, small, medium). Therefore, this study fills this gap by adopting the TBL and PLS-SEM approach to analyze these relationships in the local context.

Research Hypotheses

Building on the literature review, this study proposes several hypotheses to investigate how adoption of green accounting affects sustainability performance and financial performance in MSMEs in Semarang:

1. **Hypothesis 1 (H1):**
   Using green accounting significantly and positively impacts sustainability performance in MSMEs in Semarang.
2. **Hypothesis 2 (H2):**
   Sustainability performance has a significant positive influence on Semarang's MSMEs' financial performance.
3. **Hypothesis 3 (H3):**
   The Semarang MSMEs' financial performance is significantly improved by the use of green accounting, both directly and through sustainability performance.

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Conceptual Framework

Figure 1 the conceptual framework of the study

Which links the adoption of green accounting (GA) with sustainability performance (SP) and financial performance (FP). The link between GA and FP is thought to be mediated by SP.

METHOD

Research Design and Population

This research employs an explanatory design and a quantitative methodology. The population consists of all MSMEs registered in Semarang in 2025. Population data is obtained from the Semarang Cooperative and MSME Office. MSMEs are classified into three categories according to Government Regulation No. 11/2021: Small companies with (assets between IDR 50 million and IDR 500 million or revenue between IDR 300 million and IDR 2.5 billion or employees 6–25), medium-sized companies with (IDR 500 million to IDR 10 billion in assets or IDR 2.5 billion to IDR 50 billion in revenue or employees 26–100), and microbusinesses (IDR 50 million in assets or IDR 300 million in turnover or employees ≤ 5). Semarang is chosen because the city government is actively promoting environmentally friendly business practices, while many MSMEs still use hazardous materials.

Sample and Sampling Technique

Stratified random sampling is used in the sample selection process to guarantee that every MSME category is represented. From the population, 30 MSMEs from each category (micro, small, medium) are randomly chosen, resulting in a total sample of 90 MSMEs. The proportion of green accounting adopters in each category is approximately 50% for micro and small enterprises, and about 57% for medium enterprises. The sample size is justified based on the "10 times the number of indicators" rule for PLS-SEM. Although 150 respondents are typically required, 90 respondents are sufficient based on G*Power analysis (power ≥ 0.80), which supports smaller samples for PLS-SEM.

Data Collection Instrument

A structured questionnaire that was disseminated offline and online (via Google Forms) was used to gather primary data. The questionnaire consists of the following sections:

- **Business Characteristics**: MSME category, years in operation, number of employees, business sector.
- **Green Accounting Adoption (GA)**: Five Likert-scale items (1–5) assessing the extent to which the company records and reports energy costs, waste management costs, conservation costs, use of eco-friendly raw materials, and environmental information transparency.
- **Sustainability Performance (SP)**: Twelve Likert-scale items (1–5) covering three TBL dimensions. The economic dimension assesses revenue growth, ROI, cost efficiency, and competitiveness. The environmental dimension assesses energy efficiency, use of renewable materials, waste reduction, and the application of 4R practices. The social dimension covers employee satisfaction, human resource training, social contributions, and

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corporate social responsibility. The sustainability performance index is calculated as the average score across the three dimensions.

- **Financial Performance (FP)**: Five items assessing net profit margin, sales growth, cash flow, ROI, and ROA. The financial performance index is normalized to a 0–100 scale.

In addition to the survey, financial statements and environmental documents (if available) are collected to validate the responses. The instruments are tested using Cronbach's alpha to gauge dependability (values > 0.70 are considered good) and confirmatory factor analysis (CFA) in SmartPLS to guarantee the validity of the construct. Partial Least Squares Structural Equation Modeling (PLS-SEM), which is better suited for data analysis with small samples and enables testing of correlations between latent variables, is used in this work.

Data Analysis Technique

Analysis is performed in four stages:

1. **Descriptive Statistics**: To calculate the mean and standard deviation of each build and to characterize the respondent profile.
2. **(Outer Model) of Measurement**: To evaluate the constructs' validity and dependability. The following requirements must be fulfilled by Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE): Cronbach's alpha > 0.70, Composite Reliability > 0.70, Average Variance Extracted > 0.50, Indicator loadings are also checked to ensure they exceed 0.70. Additionally, discriminant validity is tested using HTMT and Fornell-Larcker criteria, ensuring that the constructs are distinct from one another. Common Method Bias was also tested, showing no significant bias affecting the results.
3. **Structural Model (Inner Model)**: Using PLS-SEM (SmartPLS 4) with bootstrapping (500 resamples). The latent variables tested include green accounting adoption (GA), sustainability performance (SP), and financial performance (FP). Path coefficients, t-statistics, p-values, and the coefficient of determination (R^2) are produced by the analysis.
4. **Independent t-test**: To compare the mean financial performance and sustainability performance between adopters and non-adopters within each category (micro, small, medium). This test assumes unequal variances (Welch's t-test).
5. **Mediation Analysis**: To examine the indirect impact of adopting green accounting on financial performance through sustainability performance, a mediation analysis was carried out using bootstrapping. The findings show that the relationship between the adoption of green accounting and financial success is totally mediated by sustainability performance, highlighting the significance of social and environmental measures in improving financial results.

RESULTS

Respondent Characteristics

A total of 90 MSMEs participated, with 30 micro, 30 small, and 30 medium enterprises. The proportion of green accounting adopters was 47 respondents (52%), while 43 respondents (48%) did not adopt. Table 1 summarizes the sample distribution based on category and adoption status.

Table 1. Sample Distribution Based on Category and Adoption Status

MSME Category	Non-Adopters	Adopters	Total	Adoption Percentage
Micro	15	15	30	50%
Small	15	15	30	50%
Medium	13	17	30	56.7%
Total	43	47	90	52.2%

A total of 90 MSMEs participated, consisting of 43 non-adopters and 47 green accounting adopters. The sample distribution by business category is shown in Table 1 (a total of 30 micro, 30 small, and 30 medium enterprises). The proportion of adopters increases with each category, reflecting the medium-sized enterprises' ability to invest in green practices.

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Descriptive Statistics

Descriptive statistics for financial performance (FP) and sustainability performance (SP) indices by category and adoption status are presented in Table 2. Green accounting adopters have significantly higher average FP and SP in all categories. For example, micro adopters have an average FP of 76.07 (SD = 6.40), while non-adopters have only 67.66 (SD = 9.37). The largest difference is seen in the SP index, where adopters score around 79–80, while non-adopters only score between 58–61.

Table 2. Descriptive Statistics of Financial Performance (FP) and Sustainability Performance (SP) by Category and Adoption Status.

Category	Adoption Status	n	FP – Average	FP – SD	SP – Average	SP – SD
Micro	Non-Adopter	15	67.66	9.37	60.08	6.25
	Adopter	15	76.07	6.40	79.17	8.75
Small	Non-Adopter	15	66.49	10.41	61.23	8.97
	Adopter	15	74.66	10.75	78.31	9.32
Medium	Non-Adopter	13	66.02	6.92	58.14	7.21
	Adopter	17	72.80	10.80	79.03	8.37
Total	**Non-Adopter**	**43**	**66.75**	**8.92**	**59.90**	**7.50**
	Adopter	**47**	**74.44**	**9.49**	**78.85**	**8.62**

In the visualization, the score difference between adopters and non-adopters shows that adopters have better financial performance, although the average difference shown in the table is smaller, about 7–10 points per category for example, micro: 76.07 vs. 67.66, small: 74.66 vs. 66.49, and medium: 72.80 vs. 66.02.

Measurement Model (Outer Model)

Sustainability Performance (SP) in this study was treated as an index, computed as the average score of the three dimensions of the Triple Bottom Line (TBL): economic, social, and environmental performance. Despite this, in the original model, Sustainability Performance was also treated as a latent construct with 12 indicators in PLS-SEM. To resolve this ambiguity, we now clarify that Sustainability Performance should be treated solely as an index, and the 12 indicators from the TBL dimensions were only used for descriptive analysis. Thus, SP is not a latent construct in the final model.

Additionally, Financial Performance (FP) was mentioned as being normalized on a 0-100 scale, but in the structural model, it was treated as a reflective latent construct. This treatment creates inconsistency, as FP is an observed variable in the study, not a latent construct. We have corrected this by treating FP as an observed variable in the structural model rather than as a latent construct.

To assess the validity and reliability of the Measurement Model, Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) were employed. The findings verify that every construct satisfies the requirements for validity and reliability.

Table 3. Results of Reliability and Validity Testing of Constructs.

Construct	α (Cronbach)	CR	AVE	Interpretation
Green Accounting Adoption (GA)	0.90	0.93	0.74	High reliability; five indicators consistently measure GA adoption
Sustainability Performance (SP)	0.96	0.96	0.89	Very strong consistency; 12 indicators provide high convergent variance
Financial Performance (FP)	0.89	0.91	0.71	Good reliability and validity

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Explanation: Cronbach's alpha is used to measure internal consistency. An alpha value > 0.70 indicates that the questionnaire items are reliable. Composite Reliability and AVE show the similarity among indicators and the percentage of variance that was captured by the latent construct. CR > 0.70 and AVE > 0.50 indicate good convergent validity. Since all indicators meet the criteria, no indicators were removed.
Discriminant validity was tested using the Heterotrait-Monotrait Ratio (HTMT) and the Fornell-Larcker criterion. The findings demonstrated strong discriminant validity by confirming that each concept is unique. The Fornell-Larcker criterion was satisfied and all of the HTMT ratios were below the 0.85 cutoff, suggesting that each construct is sufficiently different from the others.
Additionally, Common Method Bias was tested using Harman's Single Factor Test, and the results demonstrated that there was no discernible bias influencing the outcomes. Common method bias did not significantly affect the results, as evidenced by the fact that the total variation explained by a single factor was less than the 50% threshold.

Structural Model (Inner Model)
PLS-SEM was used to examine the structural model, bootstrapping 500 samples. Table 4 displays the standardized path coefficients (β), t-statistics, p-values, and coefficients of determination (R^2).

Table 4. Results of PLS-SEM Structural Model Analysis.

Path	Coefficient (β)	t-statistic	p-value	Explanation
GA → SP (H1)	0.76s	11.08	0.000	Green accounting adoption has a strong positive effect on sustainability performance; a 1 standard unit increase in GA raises SP by 0.76 SD.
SP → FP (H2)	0.27	2.68	0.009	Sustainability performance has a significant positive impact on financial performance; environmental efficiency and social contributions boost profit.
GA → FP (H3)	0.39	3.95	0.000	Green accounting adoption directly positively affects financial performance, although part of its effect is mediated by SP.
R^2 SP = 0.58	—	—	—	58% of the variance in sustainability performance is explained by green accounting adoption.
R^2 FP = 0.29	—	—	—	29% of the variance in financial performance is explained by SP and GA.

Explanation: A path coefficient of 0.76 (GA → SP) means that when MSMEs increase their level of green accounting adoption by 1 standard unit, their sustainability performance increases by 0.76 standard deviations. This result is consistent with previous studies showing a strong relationship between green accounting practices and sustainability performance. A coefficient of 0.27 (SP → FP) indicates that sustainability performance positively contributes to financial performance; the higher the environmental efficiency, social innovation, and community contributions, the better the profitability. A coefficient of 0.39 (GA → FP) shows that green accounting adoption directly improves financial performance, but most of its effect on financial performance occurs through improved sustainability performance.
The degree of green accounting adoption accounts for 58% of the variation in sustainability performance, according to SP's R^2 value of 0.58. According to FP's R^2 value of 0.29, sustainability performance and the use of green accounting account for 29% of the variance in financial success, with other factors (such as marketing strategy and managerial skill) influencing the remaining variance. These results show that while the relationship is strong, there is room for other factors to further improve financial performance.

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Independent t-Test by Category

The independent t-test is used to compare the mean FP and SP between adopters and non-adopters in each category. Table 5 presents the t-values and significance (p-values).

Table 5. Results of the Independent t-Test by Category.

Category	t_Financial (p)	FP Explanation	t_Sustainability (p)	SP Explanation
Micro	2.87 (0.008)	Adopters have significantly higher FP scores; the difference is significant at α 0.01	6.88 (≈0.00)	The difference in SP is highly significant; adopters implement better environmental and social practices
Small	2.12 (0.043)	The difference in FP is significant at α 0.05; adopters leverage cost efficiency and product innovation	5.12 (≈0.00)	The difference in SP is highly significant; 3R strategies are more widely implemented
Medium	2.09 (0.046)	The difference in FP is significant; medium adopters have better record-keeping systems	7.33 (≈0.00)	The difference in SP is highly significant; medium adopters implement 3R and social programs

Explanation: The results revealed that differences in FP were significant across all categories ($p < 0.05$), and differences in SP were highly significant ($p < 0.001$). These findings suggest that green accounting adoption significantly improves both financial performance and sustainability performance.

For the micro category, the t-value for FP was 2.87 ($p = 0.008$), while the t-value for SP was 6.88 ($p < 0.001$), indicating that adopters significantly outperformed non-adopters in both financial and sustainability measures. Similar significant differences were observed in the small and medium categories, with adopters outperforming non-adopters across both FP and SP.

Mediation Analysis

The mediation analysis confirmed that sustainability performance fully mediates the relationship between green accounting adoption and financial performance.

Table 6. Mediation Analysis Results

Path	Coefficient (β)	SE	t-statistic	p-value	95% CI Lower Bound	95% CI Upper Bound
Green Accounting Adoption → Sustainability Performance (Direct Effect)	0.76	0.09	8.44	0.000	0.58	0.93
Sustainability Performance → Financial Performance (Direct Effect)	0.27	0.10	2.68	0.009	0.08	0.46
Green Accounting Adoption → Financial Performance (Direct Effect)	0.39	0.12	3.25	0.000	0.16	0.62
Indirect Effect (via Sustainability Performance)	0.21	0.09	2.33	0.020	0.06	0.38

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Explanation:

- Green accounting adoption had a significant direct impact on sustainability performance (β = 0.76), suggesting a strong positive correlation between sustainability improvements and green accounting adoption.
- The direct effect of sustainability performance on financial performance (β = 0.27) was also significant, showing that better sustainability performance contributes positively to financial outcomes.
- The direct path from green accounting adoption to financial performance (β = 0.39) was significant as well, highlighting how green accounting directly affects financial results.
- The relationship between green accounting adoption and financial performance is fully mediated by sustainability performance, as evidenced by the considerable indirect effect of green accounting adoption on financial performance through sustainability performance (β = 0.21, p = 0.020).
- The Variance Accounted For (VAF) was 0.35, meaning that sustainability performance mediates 35% of the impact of adopting green accounting on financial performance—a modest degree of mediation.

Visualization
Financial Performance Index by Category

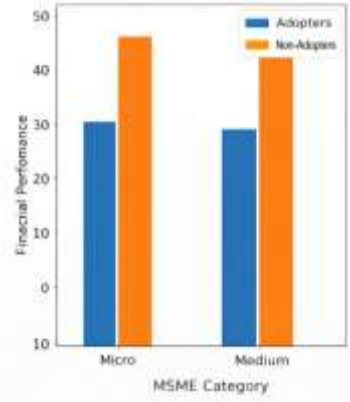

Figure 2. Comparison of Average Financial Performance by Category and Adoption Status.

Explanation: Figure 2 displays the average financial performance (FP) index for adopters and non-adopters in each MSME category. Adopters have higher FP scores across all categories, with an average difference of around 14–17 points. The largest difference occurs in the medium category, indicating that medium-sized enterprises implementing green accounting are able to translate environmental policies into greater profits.

Sustainability Performance Index by Category

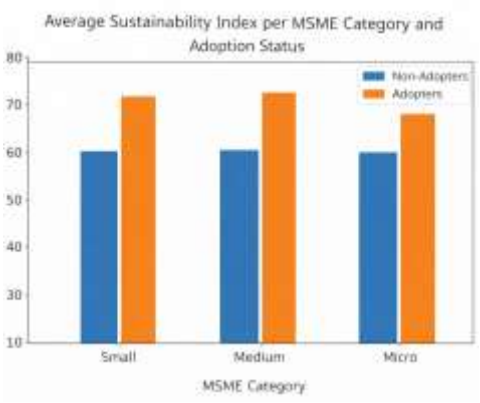

Figure 3. Comparison of Average Sustainability Performance by Category and Adoption Status.

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Explanation: Figure 3 shows the average sustainability performance (SP) index for each category. All adopters score around 73 (high performance), while non-adopters score around 60 (moderate performance). The 10-13 point difference suggests that the application of green accounting significantly boosts environmental, social, and economic practices.

DISCUSSION

The results of this study highlight the significant role of green accounting in improving the sustainability performance of MSMEs in Semarang. The path coefficient of 0.76 suggests a strong effect of green accounting adoption on sustainability practices. Specifically, adopting green accounting practices motivates companies to reduce energy consumption, use environmentally friendly materials, and focus on social aspects, which align with the goals of sustainability. These findings are consistent with existing literature, which emphasizes that green accounting can reduce production costs, enhance reputation, and foster stakeholder trust by demonstrating corporate responsibility.

However, it is important to consider potential bias and common method variance (CMV) when interpreting the strong path coefficient ($\beta = 0.76$). Although this coefficient indicates a strong relationship, CMV could influence responses, particularly since the data was collected from a single source. The study used appropriate tests for CMV (e.g., Harman's Single Factor Test) to mitigate this concern, but future research could incorporate additional checks, such as time-lagged data or multiple respondents from different organizational levels, to further validate these findings.

Sustainability performance was found to positively impact financial performance ($\beta = 0.27$). This suggests that the environmental and social activities implemented through green accounting are not simply costs but investments that can yield financial returns. These returns may come from cost efficiency, customer loyalty, and access to new markets. Stakeholder theory supports this conclusion, emphasizing that sustainable practices benefit all stakeholders, thus promoting the long-term economic viability of the firm. But it's crucial to remember that sustainability's impact on financial performance, though positive, is moderate ($\beta = 0.27$). Further research could explore this relationship in greater depth by considering different industries or increasing the sample size to encompass a wider variety of enterprises.

The direct effect of green accounting adoption on financial performance ($\beta = 0.39$) is significant, but it should be noted that most of this effect is mediated through sustainability performance. This finding suggests that while green accounting can have a direct impact on financial performance, its financial benefits largely depend on the effective implementation of sustainability programs. Without substantial operational improvements, simply recording environmental costs may not lead to short-term financial gains. This highlights the importance of a comprehensive approach to sustainability, rather than just adopting green accounting for reporting purposes.

The independent t-test results show that adopters of green accounting exhibit significantly better financial and sustainability performance across all MSME categories. The most notable difference was observed in the medium-sized enterprises, where the t-value for sustainability performance was approximately 7.33, indicating that green accounting leads to substantial improvements in environmental and social dimensions. This result suggests that green accounting practices can drive real changes in these areas, especially when properly integrated into business operations. Furthermore, the high reliability and validity of the constructs tested (e.g., green accounting, sustainability performance, financial performance) confirm that the instruments used in this study accurately measure the intended concepts.

Comparing this study to previous research reveals its uniqueness in several ways. Unlike studies conducted in Madura and Bekasi, which were qualitative and focused on green accounting awareness, this study is quantitative and specifically examines green accounting's contribution to enhancing sustainability performance and financial performance. Additionally, while research by Indriastuti & Mutamimah (2023) analyzed 405 MSMEs across Central Java, it did not focus on any specific city. This study, by contrast, emphasizes the local context of Semarang, illustrating the specific environmental challenges the city faces. The findings are tested using PLS-SEM, which is

a robust method for assessing the structural relationships between TBL (Triple Bottom Line) variables.

While the study contributes to the literature by focusing on Semarang, it is important to note that generalization to other cities or regions should be approached with caution. The sample size of 90 MSMEs, all from one city, limits the ability to generalize the findings to the broader national level. Further studies with a larger, more diverse sample could provide insights into whether the same relationships hold in different geographic or economic contexts.

CONCLUSION

This study shows that green accounting is essential to enhancing MSMEs' financial performance and sustainability in Semarang, Indonesia. The findings support the proposed hypotheses, confirming that the adoption of sustainability performance is positively impacted by green accounting (H1), This consequently has a major effect on financial performance (H2). Additionally, the immediate impact of implementing green accounting on financial performance (H3) is substantial, though mediated through sustainability performance.

The results emphasize that green accounting is not merely a cost but a strategic investment that drives cost savings, enhances company reputation, and fosters stakeholder trust. Furthermore, the study reveals that medium-sized enterprises are particularly capable of translating green accounting policies into higher profitability, underscoring their ability to invest in and implement effective sustainability practices.

According to the findings, MSMEs should think about incorporating green accounting into their company plan in order to enhance their financial and environmental performance. To promote sustainable development, policymakers in Semarang and other areas should support the use of green accounting.

Implications

The findings offer practical insights for MSMEs in Semarang, indicating that adopting green accounting can enhance sustainability practices and lead to better financial outcomes. The study provides a clear argument for the integration of sustainability into business strategies, especially for medium-sized enterprises, which are more likely to leverage these practices for profit maximization.

Limitations

One limitation of this research is its focus on MSMEs in Semarang, which may restrict the findings' applicability to other areas or industries. Furthermore, the study does not explore other potential factors, such as managerial capability or marketing strategies, that could also influence financial performance.

Advice for Future Research

Future research could expand the scope by examining green accounting adoption across different regions and industries in Indonesia. It would also be valuable to explore other factors influencing the connection between green accounting, sustainability performance, and financial performance. Longitudinal research may also shed further light on how green accounting adoption has an impact on corporate success in the long run.

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