Impact Analysis of Sustainable Financial Reporting and Environmental Regulatory Compliance on Decision Making Effectiveness in Bandung Manufacturing Industry

Mei Rani Amalia1, Tera Lesmana2, Rani Eka Arini3

1 Fakultas Ekonomi dan Bisnis, Universitas Pancasakti Tegal and mei_rani@upstegal.ac.id
2 Ciputra University and tlesmana@magister.ciputra.ac.id
3 Nusa Putra University and raniekaarini1009@gmail.com

ABSTRACT

This research investigates the impact of sustainable financial reporting and compliance with environmental regulations on decision-making effectiveness within the Bandung manufacturing industry. A quantitative analysis was conducted using survey data collected from manufacturing firms in Bandung, Indonesia. Descriptive statistics, correlation analysis, and multiple regression analysis were employed to examine the relationships between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness. The results reveal significant positive correlations between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness. Regression analysis demonstrates that both sustainable financial reporting and environmental regulations compliance are significant predictors of decision-making effectiveness, even after controlling for relevant covariates. These findings underscore the importance of integrating sustainability principles and regulatory compliance into organizational decision-making processes to enhance performance outcomes and stakeholder value within the manufacturing sector.

Keywords: Sustainable Financial Reporting, Environmental Regulations Compliance, Decision-making Effectiveness, Manufacturing Industry, Bandung

1. INTRODUCTION

In recent years, the global manufacturing landscape has indeed experienced a significant transformation towards sustainable practices, propelled by mounting environmental apprehensions and regulatory demands. Studies have highlighted the pivotal role of methodologies like Lean Six Sigma in fostering sustainable manufacturing practices, emphasizing the importance of data-driven decision-making and a positive company culture [1]. Additionally, research has shown a positive relationship between Lean Manufacturing Practices (LMP) and sustainability, with manufacturing performance acting as a mediator in enhancing economic, environmental, and social sustainability in Malaysia [2]. Furthermore, the transition to a circular economy (CE) in the automotive industry has been linked to the adoption of Industry 4.0 technologies, driven by regulatory and competitive pressures, with environmental orientation playing a mediating role in this transition [3]. These findings underscore the growing global interest in sustainable manufacturing, reflecting a shift towards more environmentally conscious and efficient production processes [4]. Moreover, stakeholder pressures have been identified as influential factors shaping the adoption and implementation of sustainability practices in manufacturing, with companies selectively responding to different stakeholder groups and country development contexts not significantly affecting the adoption of sustainability practices, supporting a universal approach to sustainability adoption [5].

Manufacturing companies in Bandung, Indonesia, face a transformative journey towards sustainability, where the interplay between sustainability financial reporting, environmental regulatory compliance, and decision-making effectiveness is critical [6]–[8]. Studies highlight the
positive impact of sustainability reporting and audit quality on firm value, emphasizing the importance of environmental engagement and the role of women in increasing firm value [9], [10]. In addition, the regulatory environment in Bandung poses challenges for entrepreneurs, including complying with environmental impact regulations and integrating ESG elements for growth and sustainability, underscoring the need for clearer regulations and support mechanisms to navigate the complex tax system. As Bandung's manufacturing sector strives to achieve sustainability, aligning financial reporting practices with environmental compliance and effective decision-making will be critical to long-term success and competitiveness.

Bandung’s manufacturing sector plays a pivotal role in the city’s economy, encompassing diverse industries like textiles, electronics, food processing, and automotive manufacturing [11]. This sector drives employment generation, export revenues, and technological innovation, contributing significantly to economic growth [12]. However, the Bandung manufacturing industry faces environmental challenges such as pollution, resource depletion, and climate change impacts, reflecting broader concerns about sustainability and environmental responsibility in industrial activities [13]. The city’s industrial landscape, while vibrant and economically crucial, needs to address these multifaceted environmental issues to ensure long-term sustainability and mitigate negative impacts on the environment and public health [14]. Efforts to balance economic growth with environmental conservation are essential for the continued success of Bandung’s manufacturing ecosystem [15].

Stakeholders in the manufacturing value chain are increasingly adopting sustainability principles, as evidenced by the emphasis on environmental-social-governance (ESG) measures in business practices [16]. Sustainable financial reporting, integrating ESG metrics with financial indicators, plays a vital role in enhancing transparency, accountability, and stakeholder trust, ultimately fostering long-term value creation [17]. Regulatory bodies, both nationally and internationally, are implementing stringent environmental standards and compliance frameworks to address environmental risks and promote sustainable development [17]. Additionally, the challenges of implementing Environmental Management Accounting (EMA) in supply chains are being recognized, emphasizing the need for cleaner production practices and regulatory reforms to monitor environmental compliance throughout the manufacturing value chain [18].

The intersection of sustainable financial reporting, environmental regulations compliance, and decision-making processes in the manufacturing industry is a crucial yet underexplored area that demands scholarly investigation [19]–[22]. Research emphasizes the significance of sustainability accounting implementation, environmental performance, and organizational performance in influencing financial outcomes and stakeholder perceptions [23]. Studies highlight the positive relationship between Sustainability Management Accounting (SMA), Environmental Management Systems (EMS), and Organizational Performance (OP) in promoting Sustainable Development Goals (SDGs) in manufacturing sectors. Additionally, the impact of environmental reporting on firm value and profitability underscores the importance of disclosing environmental information for stakeholder trust and accountability. Barriers to environmental sustainability affect the implementation of Environmental Management Accounting (EMA) in food and beverage manufacturing firms, emphasizing the need for mandatory EMA practices for environmental impact mitigation. Understanding these dynamics is crucial for firms in Bandung’s manufacturing industry to navigate the modern business landscape while upholding sustainability and corporate responsibility principles.
This research aims to address the following objectives: firstly, to assess the prevailing practices of sustainable financial reporting among manufacturing firms in Bandung and identify the factors influencing their adoption and implementation; and secondly, to gauge the extent of compliance with environmental regulations within the Bandung manufacturing industry, elucidating the drivers and barriers shaping firms' adherence to regulatory mandates.

2. LITERATURE REVIEW

2.1 Sustainable Financial Reporting

Sustainable financial reporting, encompassing the disclosure of environmental, social, and governance (ESG) factors, has gained significant traction recently as organizations realize the importance of integrating non-financial information with traditional financial metrics [24]. This form of reporting reflects a commitment to accountability, transparency, and long-term value creation, showcasing a firm's dedication to sustainable practices and stakeholder engagement [16]. The relationship between sustainable reporting and financial performance has been explored, with findings indicating that larger companies tend to be more proactive in disclosing their sustainability initiatives, while profitability may not significantly impact sustainability activities [25]. The global landscape is evolving towards standardized sustainability reporting frameworks, such as the initiatives by the IFRS Foundation and the US Securities Exchange Commission, emphasizing the growing importance of transparency and comparability in disclosures for organizations across various sectors [26].

Research findings from various studies support a positive relationship between sustainable financial reporting and firm performance. Studies by Gonçalves and Barros [27] and Korkmaz and Nur [28] emphasize the significant impact of ESG scores on financial performance, particularly highlighting the positive correlation between ESG scores and firm performance. Additionally, Khandelwal et al. [29] shed light on the role of ESG disclosure in firm performance, noting a negative ESG disclosure premium but contributing to reconciling mixed evidence on the disclosure-returns relationship. Furthermore, Atta Sarpong [30] underscores the growing attention toward ESG disclosure and sustainability reporting, although establishing a low link between sustainability reporting and firm performance. These collective findings align with the notion that companies with high sustainability performance tend to outperform their peers financially, emphasizing the importance of sustainable practices in driving financial success.

H1: There is a positive relationship between sustainable financial reporting practices and decision-making effectiveness in the Bandung manufacturing industry.

H0: There is no significant relationship between sustainable financial reporting practices and decision-making effectiveness in the Bandung manufacturing industry.

2.2 Environmental Regulations Compliance

Compliance with environmental regulations is crucial for manufacturing firms to mitigate environmental risks, ensure legal conformity, and uphold corporate social responsibility (CSR) commitments. Environmental regulations involve a wide range of mandates, such as pollution control measures, waste management protocols, and
emissions standards, all aimed at safeguarding environmental quality and public health [31]–[35]. These regulations necessitate the implementation of environmental compliance programs within business entities to minimize harmful impacts on the environment and promote green entrepreneurship. By integrating environmental compliance into their operations, firms can navigate the complexities of environmental matrices, coordinate with various professionals, and prevent noncompliance repercussions, thus contributing to a sustainable and environmentally responsible business model.

Firms that proactively adopt environmental management systems (EMS) and comply with regulatory requirements can benefit from reduced environmental impact, improved operational efficiency, and enhanced risk management practices [36]. Conversely, non-compliance with environmental regulations can result in regulatory sanctions, legal liabilities, and reputational damage, leading to significant financial and operational risks for firms [37]. Studies emphasize the importance of evaluating EMS compliance based on environmental risk management culture and practices, with a focus on information and application variables in the design and implementation of effective EMS in organizations [38]. Additionally, the evolving environmental standards and the challenges faced by industries in upgrading compliance status highlight the complexities and risks associated with environmental compliance efforts, underscoring the need for continuous monitoring and mitigation measures to address environmental concerns and ensure sustainable business practices [34].

H2: There is a positive relationship between compliance with environmental regulations and decision-making effectiveness in the Bandung manufacturing industry.

H0: There is no significant relationship between compliance with environmental regulations and decision-making effectiveness in the Bandung manufacturing industry.

2.3 Decision-Making Effectiveness

Effective decision-making is paramount for organizational success, as it involves managers making well-informed, timely, and strategic choices that align with organizational goals and stakeholder interests [39]. Sustainable financial reporting and compliance with environmental regulations are crucial factors influencing decision-making processes by providing managers with pertinent information on environmental risks, stakeholder expectations, and long-term sustainability considerations [40]. Organizations face challenges in decision-making due to internal and external variables, necessitating the use of qualitative and quantitative methodologies or quality management frameworks to forecast outcomes and overcome obstacles [41]. By defining clear goals, offering resolution options, and balancing values and interests, the quality of decision-making can be enhanced, ultimately contributing to organizational success [42].

Research studies have consistently highlighted the benefits of integrating sustainability practices into firms’ decision-making processes. Al-Qudah and Houcine [43] found that factors like firm size, profitability, and board independence significantly influence sustainability reporting and economic performance, emphasizing the
importance of sustainable strategies for corporate success. Kuo et al. [23] emphasized the significance of corporate governance, law compliance, and risk management in enhancing sustainability performance, providing direction for financial institutions aiming to contribute to sustainability objectives. Yadav and Jain [44] revealed that larger companies tend to disclose more on environmental, social, and governance efforts, underscoring the role of board structures in promoting sustainability practices. Anvari et al. [45] proposed an integrated framework for sustainable decision-making, highlighting the need for considering economic, environmental, and social outcomes in operational decisions. Yeboah et al. [46] further supported the importance of stakeholder involvement and social and environmental values in developing sustainable value propositions, contributing to firms' long-term success and stakeholder satisfaction.

2.4 Theoretical Framework: Stakeholder Theory

This study is guided by stakeholder theory, which posits that organizations should consider the interests of all stakeholders, including employees, customers, communities, and the environment, in their decision-making processes [47]. Sustainable financial reporting and environmental regulations compliance serve as mechanisms for fulfilling stakeholder expectations and promoting organizational legitimacy, trust, and social responsibility [48]. By aligning with stakeholder interests, firms can enhance their reputation, mitigate risks, and foster sustainable growth and development.

3. METHODS

3.1 Research Design

This study adopts a quantitative research design to systematically investigate the relationships between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness. A cross-sectional survey approach will be utilized to collect primary data from manufacturing firms in Bandung, Indonesia. The survey instrument will incorporate Likert-scale items to measure respondents' perceptions and attitudes regarding sustainable reporting practices, environmental compliance measures, and decision-making outcomes.

3.2 Sampling

The target population for this study comprises manufacturing firms operating in the Bandung region. A stratified random sampling technique will be employed to ensure representation across different industry sectors and organizational sizes. The sample size will be determined using appropriate statistical formulas to achieve a confidence level of 95% and a margin of error of ±5%.

3.3 Data Collection

Data will be collected using structured questionnaires administered to representatives from the selected manufacturing firms. The questionnaire will consist of multiple sections designed to capture information on the following key variables:

1. Sustainable Financial Reporting: Respondents will be asked to indicate the extent to which their organizations engage in sustainable financial reporting practices using Likert-scale items ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

2. Environmental Regulations Compliance: Participants will be queried about their organizations' compliance with environmental regulations and the effectiveness of their environmental management systems. Likert-scale items will be used to assess compliance levels and identify areas for improvement.
3. Decision-Making Effectiveness: Respondents will be asked to rate the effectiveness of their organizations’ decision-making processes in integrating sustainability considerations and regulatory requirements. Likert-scale items will gauge decision-making outcomes and performance indicators.

The survey instrument will undergo pilot testing to ensure clarity, validity, and reliability. Data collection will be conducted through online surveys, email correspondence, and direct interviews with key informants within the participating firms.

3.4 Data Analysis
Data analysis will be conducted using the Statistical Package for the Social Sciences (SPSS) Version 26 software. Descriptive statistics, including means, frequencies, and standard deviations, will be computed to summarize the survey responses and identify patterns within the data.

Additionally, inferential statistical techniques such as correlation analysis and multiple regression analysis will be employed to examine the relationships between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness. Correlation coefficients will be calculated to assess the strength and direction of associations between variables, while regression analysis will be used to model the predictive relationships between independent and dependent variables.

4. RESULTS AND DISCUSSION
4.1 Descriptive Statistics
Descriptive statistics provide insights into the central tendencies and variability of the key variables under investigation, including sustainable financial reporting practices, environmental regulations compliance, and decision-making effectiveness among manufacturing firms in Bandung. Table 1 presents the descriptive statistics for each variable, including the mean scores and standard deviations based on survey responses from the participating manufacturing firms.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Financial Reporting</td>
<td>3.82</td>
<td>0.65</td>
</tr>
<tr>
<td>Environmental Regulations Compliance</td>
<td>4.05</td>
<td>0.60</td>
</tr>
<tr>
<td>Decision-Making Effectiveness</td>
<td>4.15</td>
<td>0.70</td>
</tr>
</tbody>
</table>

The mean score for sustainable financial reporting practices among the surveyed manufacturing firms was 3.82, with a standard deviation of 0.65, indicating a moderate to high level of engagement in sustainable reporting. Similarly, the mean score for environmental regulations compliance was 4.05, with a standard deviation of 0.60, reflecting a strong commitment to regulatory adherence and environmental management. In terms of decision-making effectiveness, the mean score was 4.15, with a standard deviation of 0.70, suggesting a high level of efficacy in integrating sustainability considerations into strategic decision-making processes among the surveyed firms.

4.2 Correlation Analysis
Correlation analysis was conducted to explore the relationships between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness among manufacturing firms in Bandung. Table 2 presents the correlation coefficients between the variables based on the survey responses.
Table 2. Correlation Coefficients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sustainable Financial Reporting</th>
<th>Environmental Regulations Compliance</th>
<th>Decision-Making Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Financial Reporting</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Regulations Compliance</td>
<td>0.604*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Decision-Making Effectiveness</td>
<td>0.453*</td>
<td>0.353*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: *p < 0.05 (significant correlation)

The results indicate significant positive correlations between sustainable financial reporting and decision-making effectiveness (r = 0.604, p < 0.05) as well as between environmental regulations compliance and decision-making effectiveness (r = 0.353, p < 0.05). These findings suggest that manufacturing firms with higher levels of sustainable reporting and regulatory compliance tend to exhibit more effective decision-making processes aligned with sustainability goals.

Additionally, a moderate positive correlation was observed between sustainable financial reporting and environmental regulations compliance (r = 0.604, p < 0.05), indicating that firms engaging in transparent ESG disclosure practices are also more likely to adhere to environmental regulations.

4.3 Regression Analysis

Multiple regression analysis was conducted to model the predictive relationships between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness while controlling for relevant covariates among manufacturing firms in Bandung. Table 3 presents the results of the regression analysis based on the survey responses.

Table 3. Regression Analysis Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Financial Reporting</td>
<td>0.364</td>
<td>6.823</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Environmental Regulations Compliance</td>
<td>0.243</td>
<td>3.985</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

The regression model yielded significant results (F = 47.86, p < 0.001), indicating that sustainable financial reporting and environmental regulations compliance collectively explain a significant proportion of variance in decision-making effectiveness within the Bandung manufacturing industry.

Specifically, sustainable financial reporting emerged as a significant predictor of decision-making effectiveness (β = 0.364, t = 6.823, p < 0.001), indicating that for every one-unit increase in sustainable reporting practices, decision-making effectiveness increases by 0.36 units, after controlling for relevant covariates. Similarly, environmental regulations compliance also emerged as a significant predictor of decision-making effectiveness (β = 0.243, t = 3.985, p < 0.01), suggesting that for every one-unit increase in compliance with environmental regulations, decision-making effectiveness increases by 0.24 units, after accounting for other variables.

Discussion

The results of the regression analysis provide valuable insights into the relationships between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness within the Bandung manufacturing industry. The significant positive coefficients for sustainable financial reporting (β = 0.364, p < 0.001) and environmental regulations compliance (β = 0.243, p < 0.01) indicate that both factors have a meaningful impact on decision-making effectiveness, even after controlling for relevant covariates.
The finding that sustainable financial reporting positively influences decision-making effectiveness aligns with existing literature emphasizing the importance of transparent ESG disclosure practices in fostering accountability, stakeholder trust, and long-term value creation. The importance of sustainable financial reporting in enhancing decision-making effectiveness is supported by existing literature emphasizing the significance of transparent ESG disclosure practices in promoting accountability, stakeholder trust, and long-term value creation [26], [27], [47]–[49]. Studies highlight that while environmental and governance disclosure may not significantly impact financial performance, social disclosure plays a positive role in influencing firm performance, particularly in emerging economies like Liberia and Jordan. The push for standardized sustainability reporting frameworks, such as the ISSB and SEC proposals, underscores the increasing demand for transparent and comparable ESG disclosures, ultimately guiding strategic decision-making and value creation for organizations. Integrating sustainability into business strategies, including IPO processes, can reduce information asymmetry, enhance stakeholder perceptions, and mitigate risks associated with ESG issues, ultimately contributing to improved decision-making effectiveness and long-term value creation. Manufacturing firms that engage in sustainable reporting are better equipped to identify and prioritize sustainability risks and opportunities, leading to more informed and strategic decision-making processes that align with organizational objectives and stakeholder expectations.

Similarly, the positive relationship between environmental regulations compliance and decision-making effectiveness underscores the role of regulatory adherence in enhancing organizational performance and resilience. Firms that proactively comply with environmental regulations not only mitigate regulatory risks but also demonstrate a commitment to environmental stewardship and corporate responsibility, thereby enhancing their reputation, competitiveness, and long-term sustainability. Research indicates that environmental management practices, such as environmental corporate social responsibility (ECSR) and green intellectual capital (GIC), positively impact green innovation (GIN) and business sustainability (BUS) [50]. Additionally, proactive environmental strategies are linked to green innovation practices, with environmental regulations and firm performance playing a moderating role in promoting green innovative practices and enhancing firm profitability while minimizing negative environmental effects [51]. Furthermore, comprehensive environmental management, including environmental innovation (EI) and cleaner production (CP), has been shown to benefit a firm’s reputation and legitimacy, ultimately improving stakeholders’ perceptions of the firm’s commitment to environmental sustainability [52].

The observed correlations between sustainable financial reporting, environmental regulations compliance, and decision-making effectiveness highlight the interconnectedness of sustainable practices within the manufacturing sector. Manufacturing firms that prioritize sustainability and regulatory compliance tend to integrate environmental and social considerations into their decision-making processes, leading to enhanced performance outcomes and increased stakeholder satisfaction levels. Research by Kalubanga highlights the positive influence of compliance with government policy on firm environmental performance, emphasizing the importance of reverse logistics practices [53]. Additionally, Qalati et al. demonstrate that environmentally sustainable practices directly impact firm performance, emphasizing the significance of green employee integration and environmental sustainability [54]. Furthermore, Ogunode and Adegbie stress the importance of social engagements and corporate social responsibility initiatives in driving sustainable performance among manufacturing companies [55]. Karia and Michael’s study underscores the significant contribution of sustainable practices, such as purchasing social responsibility and environmental collaboration, to improving social performance within manufacturing firms [56]. Lastly, Pulino et al. show a positive relationship between ESG disclosure and firm performance, encouraging managers to invest in CSR practices to enhance overall performance outcomes [57].

However, it is important to acknowledge certain limitations of this study. The cross-sectional nature of the research design limits causal inferences about the observed associations, and the
reliance on self-reported survey data may introduce response bias and social desirability effects. Additionally, the study’s focus on manufacturing firms in Bandung may limit the generalizability of the findings to other industries or geographic regions.

Future research could address these limitations by employing longitudinal study designs and mixed-methods approaches to explore the dynamics of sustainable decision-making processes over time. Qualitative research methods such as interviews and case studies could provide deeper insights into the organizational factors and contextual nuances shaping sustainable practices and decision-making outcomes within the manufacturing sector.

CONCLUSION

In conclusion, this study sheds light on the critical role of sustainable financial reporting and compliance with environmental regulations in shaping decision-making effectiveness within the Bandung manufacturing industry. The findings highlight the positive impact of sustainable practices on decision-making outcomes, as evidenced by significant correlations and regression coefficients. Manufacturing firms that prioritize sustainability and regulatory compliance are better positioned to make informed, strategic decisions that align with long-term organizational objectives and stakeholder expectations. However, certain limitations, such as the cross-sectional nature of the research design and reliance on self-reported survey data, warrant consideration. Future research should explore these relationships longitudinally and employ mixed-methods approaches to provide deeper insights into the dynamics of sustainable decision-making processes. Nonetheless, the findings of this study offer actionable insights for industry practitioners, policymakers, and other stakeholders seeking to promote sustainability and responsible business practices within the manufacturing sector in Bandung and beyond.

REFERENCES


S. Kayitesi, “Strategic Decision-Making Approaches and Organizational Performance Case of Rugarama Estate Park,


