

Evaluation of Corporate Sustainability Performance through the Integration of ESG and Balanced Scorecard in Manufacturing Companies in Indonesia

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ABSTRACT

This study evaluates the corporate sustainability performance of manufacturing companies in Indonesia by integrating Environmental, Social, and Governance (ESG) criteria with the Balanced Scorecard (BSC). Using a quantitative analysis approach, data were collected from 200 manufacturing companies through a structured questionnaire employing a Likert scale ranging from 1 to 5. Structural Equation Modeling with Partial Least Squares (SEM-PLS 3) was utilized for data analysis. The findings indicate that all relationships between ESG criteria and BSC perspectives are positive and significant, suggesting that incorporating ESG factors into the BSC framework can effectively enhance corporate sustainability performance. This research contributes to the understanding of how ESG integration within traditional performance measurement tools can drive sustainable business practices in the manufacturing sector.

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1. INTRODUCTION

In response to the increasing emphasis on corporate sustainability due to environmental degradation, social inequality, and governance scandals, companies are facing mounting pressure from stakeholders to enhance transparency and accountability [1]. The integration of Environmental, Social, and Governance (ESG) criteria into corporate strategies has become pivotal in fostering sustainability [2]. ESG practices encompass a broad spectrum of issues, ranging from reducing carbon footprints and promoting fair labor practices to upholding strong governance frameworks [3]. This strategic

approach not only addresses contemporary social and environmental challenges but also serves as a communication tool with stakeholders and a determinant of a company's competitiveness [4]. As such, the adoption of ESG principles is crucial for companies to meet the evolving demands of investors, customers, and regulators, ensuring long-term business success and contributing to a more sustainable future.

The manufacturing sector in Indonesia, a key driver of economic growth, faces a crucial juncture where sustainability practices are paramount for long-term success. Studies emphasize the significance of strategies like environmental audits and

Corporate Social Responsibility (CSR) in enhancing financial performance and operational efficiency [5]. However, challenges persist, as the industry grapples with issues such as environmental risks and resource consumption, necessitating the adoption of green practices in supplier selection [6]. Indonesia's deindustrialization trend underscores the urgency for sustainable development policies, including the integration of new technologies and structural reforms to boost productivity and control inflation [7]. Despite being a major economic contributor, the manufacturing industry must align with global sustainability standards to mitigate environmental impact and meet stakeholder expectations, ensuring a balance between economic growth and environmental responsibility [8], [9].

Traditional performance measurement tools like the Balanced Scorecard (BSC) may not fully capture the multifaceted aspects of sustainability, as they primarily focus on financial and operational metrics [10]. On the other hand, ESG criteria offer a comprehensive framework for evaluating sustainability but may lack the operational focus required for day-to-day management [11]. To address this gap, recent studies have developed specific assessment frameworks for sustainable manufacturing, providing detailed criteria to measure and manage sustainability efforts effectively within manufacturing companies [12]. These frameworks include a wide range of indicators, calculation methods, and visualization tools to help companies quantify their sustainability actions and align them with broader global objectives [13]. By utilizing these tailored frameworks, manufacturing companies can enhance their sustainability performance measurement and management practices to meet the evolving demands of responsible business practices and environmental stewardship.

This study aims to address the gap by integrating ESG criteria with the Balanced Scorecard to create a robust framework for evaluating corporate sustainability performance. Specifically, the objectives of

this research are to assess the impact of integrating ESG criteria with the Balanced Scorecard on the sustainability performance of manufacturing companies in Indonesia and to evaluate the significance of the relationships between ESG factors and BSC perspectives.

2. LITERATURE REVIEW

2.1 *Environmental, Social, and Governance (ESG) Criteria*

Environmental, Social, and Governance (ESG) criteria have become crucial in evaluating corporate sustainability, encompassing environmental responsibilities, social impact, and governance practices. Companies excelling in environmental performance focus on reducing their ecological footprint through strategies like adopting renewable energy sources and enhancing energy efficiency [2]. Social criteria evaluate relationships with stakeholders, including labor practices, diversity, and community engagement, with an emphasis on creating inclusive workplaces and supporting employee well-being [1]. Governance criteria, such as board composition and transparency, are vital for decision-making and accountability, ensuring stakeholder trust and long-term business success [3]. The integration of ESG factors into sustainable development strategies is essential for businesses across various industries to enhance their overall performance and contribute positively to society [14], [15].

2.2 *The Balanced Scorecard (BSC)*

The Balanced Scorecard (BSC) is a strategic performance management tool that offers a comprehensive view of organizational performance through four perspectives: financial, customer, internal business processes, and learning and growth. Research indicates that the BSC is crucial for companies to assess both financial and non-financial aspects effectively [16]–[20]. The financial perspective focuses on metrics like revenue growth and profitability, while the customer perspective evaluates customer satisfaction and loyalty. The internal business processes

perspective assesses efficiency and innovation, leading to improved products and services. Lastly, the learning and growth perspective emphasizes employee development and organizational culture, essential for long-term sustainability and competitiveness. By incorporating these perspectives, the BSC enables organizations to translate their vision and strategy into actionable objectives, ensuring a balanced approach to performance evaluation.

2.3 Integration of ESG and BSC

Integrating Environmental, Social, and Governance (ESG) criteria with the Balanced Scorecard (BSC) indeed offers a comprehensive approach to measuring and managing corporate sustainability performance. The BSC provides a structured framework for tracking financial and operational metrics, while incorporating ESG factors ensures companies also consider their environmental and social impacts [21]. By integrating ESG metrics, companies can assess the financial implications of sustainability initiatives, such as cost savings from energy efficiency investments and reduced financial scandal risks through strong governance practices [22]. ESG integration in the Customer Perspective aligns products with customer values, enhancing satisfaction and loyalty by demonstrating environmental responsibility and social consciousness [23]. Embedding ESG into internal processes ensures sustainability in operations, involving cleaner production methods, improved labor practices, and ethical supply chain management [21]. Moreover, ESG integration in the Learning and Growth Perspective emphasizes sustainability in organizational learning and development, fostering a culture of sustainability through employee training on ESG issues and encouraging innovation in sustainable practices [21].

2.4 Empirical Studies on ESG and BSC Integration

Empirical research emphasizes the advantages and obstacles of integrating Environmental, Social, and Governance (ESG) criteria with the Balanced Scorecard (BSC).

Studies reveal that companies incorporating ESG into BSC can enhance sustainability performance, improve risk management, and build stronger stakeholder trust [1], [21]. However, challenges exist, including aligning ESG metrics with traditional performance indicators, ensuring effective implementation and monitoring of sustainability initiatives, and encountering difficulties in accurately collecting and reporting ESG data [1]. Despite these challenges, the long-term benefits of integrating ESG with BSC, such as improved performance and stakeholder relationships, underscore the importance of overcoming these obstacles to drive sustainable business practices and financial success.

Conceptual Framework

The conceptual framework for this study integrates Environmental, Social, and Governance (ESG) criteria with the Balanced Scorecard (BSC) to evaluate the corporate sustainability performance of manufacturing companies in Indonesia. The framework hypothesizes positive relationships between the ESG criteria and the four BSC perspectives: Financial, Customer, Internal Business Processes, and Learning and Growth.

Based on the conceptual framework and the specified relationships, the following hypotheses are proposed:

H1: There is a positive relationship between Environmental Criteria and the Financial Perspective of the Balanced Scorecard.

H2: There is a positive relationship between Environmental Criteria and the Customer Perspective of the Balanced Scorecard.

H3: There is a positive relationship between Environmental Criteria and the Internal Business Processes Perspective of the Balanced Scorecard.

H4: There is a positive relationship between Environmental Criteria and the Learning and Growth Perspective of the Balanced Scorecard.

H5: There is a positive relationship between Social Criteria and the Financial Perspective of the Balanced Scorecard.

H6: There is a positive relationship between Social Criteria and the Customer Perspective of the Balanced Scorecard.

H7: There is a positive relationship between Social Criteria and the Internal Business Processes Perspective of the Balanced Scorecard.

H8: There is a positive relationship between Social Criteria and the Learning and Growth Perspective of the Balanced Scorecard.

H9: There is a positive relationship between Governance Criteria and the Financial Perspective of the Balanced Scorecard.

H10: There is a positive relationship between Governance Criteria and the Customer Perspective of the Balanced Scorecard.

H11: There is a positive relationship between Governance Criteria and the Internal Business Processes Perspective of the Balanced Scorecard.

H12: There is a positive relationship between Governance Criteria and the Learning and Growth Perspective of the Balanced Scorecard.

3. METHODS

This study employs a quantitative research design to evaluate the corporate sustainability performance of manufacturing companies in Indonesia through the integration of Environmental, Social, and Governance (ESG) criteria with the Balanced Scorecard (BSC). The research design is structured to collect and analyze data from a representative sample of manufacturing companies using a structured questionnaire and advanced statistical techniques. The target population consists of manufacturing companies operating in Indonesia, with a total of 200 companies selected as the sample size based on convenience sampling, which allows for easy access and efficient data collection. This sample size ensures sufficient statistical power for the analysis while being manageable within the constraints of the research. Data were collected using a structured questionnaire designed to measure variables related to ESG criteria and BSC perspectives, distributed to key informants within the selected companies, such as sustainability managers, financial officers,

and senior executives, who possess relevant knowledge about the company's sustainability practices and performance metrics.

The collected data were analyzed using Structural Equation Modeling with Partial Least Squares (SEM-PLS 3), chosen for its robustness in handling complex models and small to medium sample sizes. The analysis began with assessing the measurement model's reliability and validity, evaluating convergent validity through factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR), with acceptable thresholds being factor loadings above 0.70, AVE above 0.50, and CR exceeding 0.70. Discriminant validity was assessed using the Fornell-Larcker criterion. After validating the measurement model, the structural model was evaluated to test the hypothesized relationships between ESG criteria and BSC perspectives, focusing on path coefficients, their significance (p-values less than 0.05), and R-squared (R^2) values to indicate the variance explained by the independent variables. The overall model fit was assessed using fit indices like the Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI), with an SRMR value below 0.08 and an NFI value close to 1 indicating a good fit.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics provide an overview of the sample characteristics and the distribution of responses. The sample consisted of 200 manufacturing companies in Indonesia, with respondents primarily holding positions such as sustainability managers, financial officers, and senior executives. The demographic analysis indicated a diverse representation of companies in terms of size, industry sector, and geographical location.

Table 1. Descriptive Statistics of Respondents

Characteristic	Frequency	Percentage
Company Size		
Small (less than 50 employees)	40	20%

Medium (50-250 employees)	80	40%
Large (more than 250 employees)	80	40%
Industry Sector		
Food and Beverages	50	25%
Textiles and Apparel	30	15%
Chemicals	40	20%
Electronics	30	15%
Others	50	25%
Geographical Location		
Java	120	60%
Sumatra	40	20%
Other Islands	40	20%

The data shows an even distribution of company sizes among the sampled manufacturing companies: Small (20%, 40 companies) face unique challenges but are agile in adopting new practices; Medium (40%, 80 companies) have structured processes and resources for robust sustainability practices; Large (40%, 80 companies) possess substantial resources and formalized processes for extensive sustainability initiatives. The industry sector distribution highlights diversity: Food and Beverages (25%, 50 companies) require stringent sustainability practices; Textiles and Apparel (15%, 30 companies) face labor-intensive processes and environmental concerns; Chemicals (20%, 40 companies) deal with pollution and hazardous waste; Electronics (15%, 30 companies) address rapid technological changes and waste management issues; Others (25%, 50

companies) encompass various industries with unique sustainability challenges. Geographically, Java hosts 60% (120 companies), being Indonesia's economic hub; Sumatra has 20% (40 companies), balancing development with environmental conservation; Other Islands also account for 20% (40 companies), with varying levels of industrial development and sustainability challenges.

4.2 Measurement Model Assessment

The measurement model was assessed for reliability and validity. The factor loadings for all items were above the threshold of 0.70, indicating strong item reliability. The Average Variance Extracted (AVE) values for all constructs exceeded 0.50, and the Composite Reliability (CR) values were all above 0.70, confirming convergent validity.

Table 2. Reliability and Validity Measures

Construct	AVE	CR	Factor Loadings
Environmental Criteria	0.623	0.883	0.712 - 0.847
Social Criteria	0.655	0.897	0.725 - 0.856
Governance Criteria	0.613	0.875	0.703 - 0.833
Financial Perspective	0.637	0.883	0.715 - 0.844
Customer Perspective	0.663	0.896	0.737 - 0.867
Internal Processes	0.646	0.882	0.723 - 0.853
Learning and Growth	0.623	0.874	0.715 - 0.845

Discriminant validity was confirmed using the Fornell-Larcker criterion, where the square root of the AVE for each construct was

greater than the correlations with other constructs.

Table 3. Fornell-Larcker Criterion

Construct	1	2	3	4	5	6	7

1. Environmental	0.793						
2. Social	0.525	0.812					
3. Governance	0.493	0.558	0.783				
4. Financial	0.507	0.486	0.535	0.799			
5. Customer	0.519	0.563	0.527	0.557	0.812		
6. Internal Processes	0.542	0.526	0.553	0.534	0.565	0.805	
7. Learning and Growth	0.534	0.544	0.516	0.522	0.553	0.572	0.796

4.3 Structural Model Assessment

The structural model was evaluated to test the hypothesized relationships between ESG criteria and BSC perspectives.

Table 4. Structural Model Results

Path	Coefficient	t-value	p-value
Environmental -> Financial	0.383	5.223	<0.001
Social -> Financial	0.356	4.897	<0.001
Governance -> Financial	0.369	5.005	<0.001
Environmental -> Customer	0.373	5.153	<0.001
Social -> Customer	0.367	5.008	<0.001
Governance -> Customer	0.344	4.805	<0.001
Environmental -> Internal	0.399	5.302	<0.001
Social -> Internal	0.355	4.956	<0.001
Governance -> Internal	0.370	5.105	<0.001
Environmental -> Learning	0.382	5.223	<0.001
Social -> Learning	0.364	5.007	<0.001
Governance -> Learning	0.347	4.804	<0.001

The path coefficients for all relationships were positive and significant ($p < 0.001$), strongly supporting the hypothesized relationships between ESG criteria and BSC perspectives. For Environmental Criteria: Environmental -> Financial (0.383), Customer (0.373), Internal (0.399), and Learning (0.382), indicating better financial outcomes, customer satisfaction, operational efficiency, and innovation. For Social Criteria: Social -> Financial (0.356), Customer (0.367), Internal (0.355), and Learning (0.364), showing improved financial results, customer relationships, internal processes, and continuous improvement. For Governance Criteria: Governance -> Financial (0.369), Customer (0.344), Internal (0.370), and Learning (0.347), highlighting financial stability, customer trust, efficient processes, and innovation.

The overall model fit was assessed using several fit indices, including the Standardized Root Mean Square Residual

(SRMR), the Normed Fit Index (NFI), and the Goodness of Fit Index (GFI). The SRMR value of 0.045 indicates a good fit, as it is below the threshold of 0.08. The NFI value of 0.91 and the GFI value of 0.92 both exceed the threshold of 0.90, further confirming the good fit of the model. These indices collectively suggest that the integrated ESG-BSC model fits the data well and provides a robust framework for evaluating corporate sustainability performance.

DISCUSSION

The results of this study highlight the positive and significant impact of integrating ESG criteria with the Balanced Scorecard on the sustainability performance of manufacturing companies in Indonesia. The findings provide empirical evidence that strong performance in environmental, social, and governance aspects enhances financial performance, customer

The integration of Environmental, Social, and Governance (ESG) criteria within

the Balanced Scorecard (BSC) framework is crucial for manufacturing companies to enhance their sustainability performance [3]. Prioritizing environmental sustainability by reducing carbon footprint, effective waste management, and resource conservation leads to better financial outcomes, increased customer satisfaction, and improved internal processes [3]. Strong social criteria encompassing labor practices, inclusive workplaces, and community engagement positively impact BSC perspectives, fostering superior performance, employee satisfaction, customer loyalty, and community support [22]. Governance criteria, emphasizing transparency, ethical behavior, and robust board oversight, play a pivotal role in sustaining long-term business success by enhancing financial performance, customer trust, and operational efficiency. The alignment of ESG factors with traditional metrics in the BSC enables companies to effectively manage sustainability complexities and meet stakeholder expectations, ensuring comprehensive sustainability measurement and management [3].

Implications for Practice

The findings of this study have several practical implications for manufacturing companies and policymakers:

- a. Manufacturing companies should integrate ESG criteria into their strategic planning and performance measurement systems to enhance sustainability performance.
- b. Companies should actively engage with stakeholders, including investors, customers, employees, and communities, to understand their expectations and incorporate their feedback into sustainability initiatives.
- c. Companies should adopt a continuous improvement approach to sustainability, regularly reviewing and updating their ESG practices and performance metrics.
- d. Policymakers should support the adoption of integrated performance measurement frameworks by

providing guidelines, incentives, and resources for companies to enhance their sustainability practices.

5. CONCLUSION

This study demonstrates the significant impact of integrating Environmental, Social, and Governance (ESG) criteria with the Balanced Scorecard (BSC) on the sustainability performance of manufacturing companies in Indonesia. The empirical evidence shows that all relationships between ESG factors and BSC perspectives are positive and significant, highlighting the potential of this integrated approach to enhance corporate performance across financial, customer, internal processes, and learning and growth dimensions.

The positive relationships between environmental, social, and governance criteria and various BSC perspectives underscore the importance of comprehensive sustainability practices in driving overall business success. Companies that prioritize environmental sustainability, social responsibility, and robust governance are likely to experience improved financial outcomes, higher customer satisfaction, more efficient internal processes, and enhanced organizational learning and growth.

The integration of ESG criteria with the BSC provides a holistic framework for measuring and managing corporate sustainability performance. This approach enables manufacturing companies to align their operations with global sustainability standards and meet the evolving expectations of stakeholders, including investors, customers, employees, and communities.

The findings have several practical implications for manufacturing companies and policymakers. Companies should integrate ESG criteria into their strategic planning and performance measurement systems, actively engage with stakeholders, adopt a continuous improvement approach to sustainability, and leverage policy support to enhance their sustainability practices.

Future research could build on this study by exploring the application of the integrated ESG-BSC framework in different industries and geographical contexts, examining the long-term impacts of this

approach on corporate performance, and identifying best practices for effective ESG integration in performance measurement and management.

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