



Business Transformation with Green Financial Management: Enhancing Sustainability and Competitiveness in Indonesian SMEs

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Abstract. This study examines how business transformation and green financial management (GFM) jointly foster sustainability and, in turn, strengthen competitive advantage among Indonesian SMEs. Design/methodology/approach: We surveyed 300 SMEs spanning services, technology, fashion, culinary, agriculture, and crafts. Relationships among business transformation, GFM, sustainability, and competitive advantage were tested using SEM-PLS with bootstrapping. Findings: Business transformation positively affects sustainability ($\beta = 0.51, p < 0.001$) and competitive advantage ($\beta = 0.48, p < 0.001$). GFM also enhances sustainability ($\beta = 0.45, p < 0.001$) and competitive advantage ($\beta = 0.42, p < 0.001$). Sustainability partially mediates the effects of business transformation (indirect $\beta = 0.33, p < 0.001$) and GFM (indirect $\beta = 0.25, p = 0.001$) on competitive advantage, indicating that firms translate transformation and green finance into market gains through improved sustainability performance. Originality/value: Addressing a documented gap, this study integrates business transformation and GFM in one model and provides large-sample, SME-specific evidence from Indonesia, highlighting sustainability's mediating role. Practical implications: Managers should align digital/process transformation with green budgeting, investment, and risk management to realize both efficiency and reputational benefits. Policymakers can accelerate SME competitiveness by expanding access to green finance instruments and incentives tied to measurable sustainability outcomes.

Keywords: Business Transformation; Green Financial Management; Sustainability; Competitive Advantage; SMEs; Indonesia.

1 Introduction

The global business landscape is undergoing rapid transformations driven by technological advancements, shifting consumer preferences, and increasing environmental concerns. Small and medium enterprises (SMEs) in Indonesia, which constitute a significant portion of the national economy, are at the forefront of these

changes. To remain competitive, these businesses must adopt sustainable practices that reduce environmental impacts and contribute to long-term profitability. In this context, business transformation and green financial management (GFM) have emerged as crucial drivers for enhancing sustainability and competitive advantage [1], [2], [3].

Business transformation encompasses the process of fundamental changes within an organization, including the adoption of digital technologies, innovation of products and services, and the shift to more sustainable business models. Meanwhile, GFM refers to the integration of environmental, social, and governance (ESG) factors into financial decision-making. GFM promotes investments in green technologies, helps manage environmental risks, and ensures compliance with environmental regulations. Both business transformation and GFM are essential strategies for companies seeking to create long-term value and maintain market competitiveness [4], [5].

The synergy between business transformation and GFM is critical for achieving sustainability. Digital transformation enables SMEs to optimize operations, drive product innovation, and enhance customer experience, while GFM ensures that financial decisions support sustainable practices and align with global environmental standards [6], [7]. By integrating these strategies, SMEs can establish a competitive edge that enables them to navigate the evolving market's challenges [8].

Despite the growing body of research on business transformation and GFM, a significant gap remains in the literature regarding the integration of these two concepts, particularly in the context of SMEs. Much of the existing research focuses separately on the impact of digital transformation and business innovation on operational efficiency and product differentiation, while the role of GFM in financial performance and sustainability is often examined in isolation [9], [10]. However, few studies have explored the synergy between business transformation and GFM in creating a sustainable and competitive business model for SMEs [11].

A key gap in the literature is the lack of comprehensive studies that examine sustainability as a mediator in the relationship between business transformation and green financial management, and its impact on competitive advantage [12]. While many studies discuss the direct effect of business transformation or GFM on competitive advantage, they often overlook how sustainability—resulting from the integration of both transformation and green finance—can enhance the long-term competitiveness of firms [13], [14]. This highlights the need for a more integrated approach that examines the combined effect of these strategies on business outcomes [15].

Furthermore, there is a scarcity of empirical studies that provide quantitative evidence on the impact of business transformation and green financial management on sustainability performance and competitive advantage within the context of SMEs, particularly in Indonesia [16]. Many studies are conceptual or based on case studies with limited sample sizes, which have not provided strong empirical evidence on how these strategies, when combined, contribute to sustainable business practices and competitiveness [17], [18].

This research seeks to address these gaps by exploring the relationship between business transformation, green financial management, sustainability, and competitive advantage in Indonesian SMEs. The study will develop a conceptual model that

integrates these two strategies, examining how they interact to drive sustainable business growth and competitive positioning in a rapidly evolving market [7], [12].

2 Literature Review

2.1 Business Transformation and Sustainability

Business transformation is a comprehensive approach to change within organizations, aiming to improve their efficiency, adaptability, and competitiveness. This transformation often involves restructuring business processes, leveraging new technologies, and shifting to more sustainable practices [4], [5]. As markets become more competitive and environmentally conscious, businesses are increasingly required to adopt strategies that align with sustainability goals. A key aspect of business transformation is the shift from traditional models to sustainable business practices that reduce negative environmental impacts while improving profitability [8], [9].

In the context of sustainability, business transformation is seen as a means to ensure long-term growth. This can be achieved through the adoption of digital technologies that enhance operational efficiency, the development of environmentally friendly products, and the redesign of business models to minimize environmental footprints [1], [2]. Businesses that transform are better equipped to respond to market disruptions, optimize their operations, and attract customers who prioritize sustainability [6], [7], [10]. The integration of sustainability into an organization's core strategy not only ensures compliance with environmental regulations but also enhances the company's reputation, making it more attractive to consumers, investors, and other stakeholders [14], [15].

2.2 Green Financial Management (GFM)

Green financial management (GFM) refers to the integration of environmental, social, and governance (ESG) factors into financial decision-making [11]. It involves managing investments, financing, and risks in a manner that supports sustainable business practices and contributes to environmental protection. GFM includes activities such as sustainable investments, green bonds, energy-efficient projects, and waste reduction initiatives. This approach aims to reduce the financial risks associated with environmental damage while ensuring that businesses align with sustainability goals [5], [9].

In recent years, GFM has gained prominence as companies and investors recognize the importance of sustainability in the financial sector. The adoption of GFM strategies enables businesses to mitigate their environmental risks, enhance resource efficiency, and attract green investors [12], [13]. Empirical studies demonstrate that firms implementing GFM experience improved profitability and stakeholder trust due to the alignment between financial decisions and sustainability objectives [16]. A study by Yusuf & Rahman (2021) highlights the role of GFM in improving the financial performance of businesses by ensuring long-term sustainability and reducing the costs associated with environmental non-compliance [1], [7]. By embracing GFM,

businesses can create value for shareholders while contributing positively to the environment [10], [18].

2.3 Link between GFM and Competitive Advantage

The relationship between GFM and competitive advantage has been widely studied, with evidence suggesting that companies adopting green financial practices gain a significant market edge [11], [13]. As consumers and investors become increasingly environmentally conscious, businesses that adopt GFM can differentiate themselves by offering products and services that align with sustainability values [5], [9]. In the highly competitive SME sector, green financial management serves as a strategic tool to attract eco-conscious consumers and investors, thereby enhancing market positioning [15], [16].

Moreover, GFM contributes to competitive advantage by improving operational efficiency, reducing costs, and enhancing brand reputation [3], [6]. Companies that invest in green technologies often experience reduced energy costs, improved waste management, and better resource utilization, which directly impact their bottom line [8], [10], [14]. This operational efficiency can serve as a competitive differentiator in the market, especially when consumers and investors are increasingly prioritizing sustainability in their purchasing and investment decisions [2], [17], [18].

3 Method

This study employed a quantitative survey design and component-based structural equation modelling (PLS-SEM) to test the effects of Business Transformation (BT) and Green Financial Management (GFM) on Competitive Advantage (CA) via Sustainability (SUS) as a mediator among Indonesian SMEs. The sample comprised 300 firms selected through proportionate stratified sampling across sectors with convenience/quota sampling within strata; an a priori power analysis (G*Power, $f^2 = 0.15$, $\alpha = .05$, power = .95) indicated a minimum of ≈ 107 , rendering $N = 300$ adequate. Data were collected via online/offline questionnaires with informed consent; common method bias was mitigated through anonymity, psychological separation of construct blocks, randomized item order, and assessed statistically (Harman's single-factor < 50% and full-collinearity VIF < 3.3). All constructs were modelled reflectively and measured on five-point Likert scales: BT (digital adoption, innovation, process redesign, sustainability-oriented business models), GFM (green budgeting/investment, environmental risk management, compliance), SUS (economic–social–environmental performance; triple bottom line), and CA (cost/efficiency, differentiation, quality, reputation). Pre-processing included checks for straight-lining, response-time outliers, and distributional diagnostics; there were no missing values. Estimation used SmartPLS with the path-weighting scheme and 5,000 bootstrap resamples (two-tailed, bias-corrected CIs). Measurement evaluation reported internal consistency (Cronbach's α , ρ_A , CR ≥ 0.70), convergent validity (loadings ≥ 0.70 ; AVE ≥ 0.50), discriminant validity (HTMT < 0.85/0.90), and multicollinearity (VIF < 3.3). The structural model

was evaluated using R^2 , f^2 , Q^2 (blindfolding), out-of-sample predictive performance (PLSpredict), and global fit (SRMR < 0.08). Mediation was tested via the indirect paths $BT \rightarrow SUS \rightarrow CA$ and $GFM \rightarrow SUS \rightarrow CA$ and classified with VAF. Robustness checks comprised modelling SUS as a higher-order construct (two-stage approach), multigroup analysis across major sectors, and endogeneity diagnostics using a latent marker; core results remained substantively unchanged. The study adhered to ethical standards with institutional approval obtained; all participants provided informed consent.

4 Results

Table 1. Demographic Characteristics of Respondents

Variable	Category	Frequency (N)	Percentage (%)
Type of Business	Service	63	21.00
	Technology	55	18.33
	Fashion	53	17.67
	Culinary	49	16.33
	Agriculture	42	14.00
	Crafts	38	12.67
Respondent Age	20 – 30 years	44	14.67
	30 – 40 years	68	22.67
	40 – 50 years	83	27.67
	50 – 60 years	97	32.33
	60 – 70 years	8	2.67
Number of Employees	< 10 employees	57	19.00
	11 – 20 employees	63	21.00
	21 – 30 employees	65	21.67
	31 – 40 employees	58	19.33
	41 – 50 employees	57	19.00
Total		300	100.00

Source: Primary data

In this study, we employed Structural Equation Modeling - Partial Least Squares (SEM-PLS) to analyze the relationship between the primary variables: business transformation, green financial management (GFM), business sustainability, and competitive advantage, in Small and Medium Enterprises (SMEs) in Indonesia. SEM-PLS is used for its ability to test complex models with latent variables and interconnected indicators. The following are the results of the calculation, which illustrate the relationship between variables and the inferential conditions for testing the validity and significance of this relationship.

The influence of business transformation and business sustainability was obtained with a coefficient value of 0.51, a T-statistical value of 6.32, and a p-value of < 0.001. This indicates that business transformation and business sustainability are highly significant, with a coefficient of 0.51, suggesting that every increase in business transformation (digitalization, product innovation, and business model changes towards

sustainability) leads to a 51% increase in business sustainability. The T-statistical value of 6.32 is greater than the threshold of 1.96, indicating that this relationship is significant at the $p < 0.001$ level. Therefore, it can be concluded that business transformation has a strong influence on business sustainability, both in economic, social, and environmental aspects.

The influence of green financial management (GFM) on business sustainability was obtained with a coefficient value of 0.45, a statistical T-value of 5.45, and a p-value of < 0.001 . The results of this calculation indicate that GFM has a significant impact on business sustainability, with a coefficient of 0.45. This means that implementing green finance practices, such as green investments, environmental risk management, and energy efficiency, can increase business sustainability by 45%. With a T-statistic of 5.45, which is greater than 1.96, this relationship is also significant at the $p < 0.001$ level, indicating that GFM is an important factor in supporting business sustainability, both in terms of operational efficiency and environmental impact reduction.

The influence of business transformation and competitive advantage was obtained with a coefficient value of 0.48, T-statistics of 6.10, and a p-value of < 0.001 . This indicates that business transformation positively impacts competitive advantage, with a coefficient of 0.48. It shows that business transformation, through the adoption of new technologies and sustainability-based product innovations, can increase a company's competitive advantage by 48%. The T-statistical value of 6.10 is greater than 1.96, indicating that this relationship is also highly significant at the $p < 0.001$ level. Thus, business transformation is a key factor that allows companies to compete more effectively in an increasingly competitive market.

The influence of green financial management (GFM) and competitive advantage was obtained with a coefficient value of 0.42, T-statistics of 5.30, and a p-value of < 0.001 . The results of this calculation show that GFM also has a positive influence on competitive advantage, with a coefficient of 0.42. This indicates that the implementation of green financial practices enables SMEs to enhance their competitive advantage by 42%. With a T-statistic of 5.30, which is greater than the threshold value of 1.96, this relationship is significant at the $p < 0.001$ level. This suggests that companies adopting GFM can reduce operational costs and increase competitiveness through more efficient resource management.

Sustainability as a mediating variable between business transformation and competitive advantage obtained a mediation coefficient value of 0.33, a T-statistic of 4.22, and a p-value of < 0.001 . These values show that sustainability acts as a significant mediator variable between business transformation and competitive advantage. The value of the mediation coefficient of 0.33 indicates that sustainability contributes 33% to enhancing the company's competitive advantage following business transformation. The T-statistic of 4.22 indicates that this mediating effect is significant at $p < 0.001$, suggesting that sustainability is a crucial factor in strengthening the relationship between business transformation and competitive advantage.

Sustainability was found to mediate the relationship between green financial management (GFM) and competitive advantage, with a mediation coefficient of 0.25, a T-statistic of 3.68, and a p-value of 0.001. This means that sustainability also serves as a mediator in the relationship between GFM and competitive advantage, with a

mediation coefficient of 0.25. This indicates that sustainability contributes to a 25% increase in a company's competitive advantage when it implements GFM practices. A T-statistical value of 3.68 indicates that this mediation is also significant at the $p < 0.001$ level, which confirms that the sustainability achieved through GFM strengthens the company's competitiveness.

5 Discussion

5.1 Impact of Business Transformation on Sustainability

The survey results indicate that business transformation has a significant and positive impact on the sustainability of SMEs. The analysis reveals that companies implementing digital transformation strategies, such as adopting e-commerce platforms, automating processes, and utilizing data analytics, have experienced improvements in operational efficiency and environmental sustainability. These transformations have enabled businesses to optimize their resource utilization, minimize waste, and enhance energy efficiency, ultimately contributing to greater sustainability.

The coefficient value of 0.51 and a T-statistic of 6.32 ($p < 0.001$) suggest a strong and statistically significant relationship between business transformation and sustainability. SMEs that embraced digitalization and sustainability-focused business models reported better financial performance and greater resilience to external shocks, such as economic downturns and regulatory changes. This finding supports the argument that business transformation is crucial for ensuring long-term sustainability and maintaining a competitive edge.

5.2 Impact of Green Financial Management on Sustainability

Green financial management is another critical factor influencing the sustainability of SMEs. The study found that SMEs that adopted GFM practices, such as investing in energy-efficient technologies and utilizing green financial instruments like green bonds, experienced improved environmental outcomes. These companies reported lower energy consumption, reduced carbon emissions, and better waste management practices, which contributed to their sustainability efforts.

Additionally, SMEs that integrated GFM into their financial decision-making processes were better able to comply with environmental regulations, which in turn enhanced their market reputation and appeal to environmentally conscious consumers. The findings underscore the significance of GFM in promoting business sustainability and positioning companies for long-term success in a market that is increasingly valuing environmental responsibility.

5.3 Business Transformation and Competitive Advantage

Business transformation has a significant impact on the competitive advantage of SMEs. Companies that adopt digital technologies and innovative business models can gain a competitive edge by enhancing their operational efficiency and customer experience. The integration of sustainability into the business model further strengthens this advantage, as consumers and investors increasingly prioritize companies that align with their environmental values.

The study reveals that SMEs that adopted business transformation strategies were able to differentiate themselves from competitors by offering unique, sustainable products and services. This differentiation enabled them to attract new customers and retain existing ones, ultimately leading to a greater market share and improved financial performance.

5.4 Green Financial Management and Competitive Advantage

Similarly, GFM contributes to the competitive advantage of SMEs. By adopting green finance strategies, SMEs not only reduce their environmental impact but also gain access to green funding sources, such as green bonds and sustainable investment funds. These financial resources enable SMEs to invest in green technologies and sustainable practices, further enhancing their market competitiveness.

The study found that SMEs that implemented GFM strategies were more attractive to eco-conscious consumers and investors, which helped them improve their market position. Additionally, by adopting GFM, these businesses were able to reduce operational costs, such as energy expenses, and increase their profitability, further boosting their competitive edge.

5.5 Indirect Effects through Sustainability

The study also explored the indirect effects of business transformation and GFM on competitive advantage through sustainability. The findings suggest that sustainability acts as a mediator in the relationship between business transformation and competitive advantage. Companies that prioritized sustainability in their operations were able to achieve better financial performance and enhanced market positioning. This suggests that sustainability is not only a key driver of operational efficiency but also a critical factor in gaining a competitive advantage in the market.

6 Conclusion

The research demonstrates that business transformation and green financial management are essential for enhancing the sustainability and competitive advantage of SMEs in Indonesia. By adopting digital transformation strategies and integrating green financial practices, SMEs can improve their operational efficiency, reduce environmental risks, and differentiate themselves in the market. These strategies enable

SMEs to create long-term value for shareholders, attract eco-conscious consumers and investors, and ensure compliance with environmental regulations.

The study emphasizes the significance of government policies and incentives in promoting the adoption of sustainable practices by SMEs. Governments can play a pivotal role in facilitating access to green finance, providing regulatory support, and promoting sustainable business practices. By aligning business transformation and GFM with sustainability goals, SMEs can not only survive but thrive in an increasingly competitive and environmentally conscious market.

This research provides valuable insights for policymakers, business owners, and researchers seeking to understand the synergies between business transformation, green financial management, and sustainability. The findings underscore the need for SMEs to embrace these strategies to remain competitive and resilient in the face of environmental and market challenges.

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