FINANCIAL STRATEGIES FOR MSMES IN TRANSITIONING TO A GREEN ECONOMY: INSIGHTS AND IMPLICATIONS

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Abstract

The transition to a green economy presents a strategic imperative for Micro, Small, and Medium Enterprises (MSMEs), offering pathways for sustainable growth and resilience. However, this transition is fraught with significant financial barriers that hinder widespread adoption. This study investigates the financial strategies employed by MSMEs to facilitate their shift towards circular and sustainable business models. Utilizing a quantitative approach, data was collected via a structured questionnaire from 150 MSME owners and managers across the manufacturing and service sectors. The analysis employed descriptive statistics and multiple linear regression to pinpoint key determinants. Results reveal that access to green financing ($\beta = 0.42$, $p < 0.01$), the adoption of digital technologies for resource efficiency ($\beta = 0.31$, $p < 0.05$), and strategic stakeholder collaboration ($\beta = 0.28$, $p < 0.05$) are the most significant positive predictors of successful green economic transition. Conversely, high perceived investment costs and a lack of regulatory incentives pose substantial impediments. The discussion contextualizes these findings within the broader literature on circular economy and digital transformation, highlighting how MSMEs leverage financial innovation and technology to overcome traditional barriers. This study contributes to the extant literature by providing an integrated framework that connects financial strategy, technological capability, and multi-stakeholder engagement as a triad for green transition. Practical implications include recommendations for policymakers to design targeted financial instruments and for MSMEs to proactively integrate digital tools into their financial and operational planning for sustainability.

Keywords: *Green Economy, MSMEs, Financial Strategy, Circular Economy, Sustainable Finance.*

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1. Introduction

The global economic paradigm is undergoing a fundamental shift towards sustainability, driven by pressing environmental challenges and evolving regulatory landscapes. The concept of a green economy, which aims for improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities, has become central to this transformation (UNEP, 2011). For Micro, Small, and Medium Enterprises (MSMEs), which constitute the backbone of many economies, this transition is not merely an ethical choice but a strategic necessity for long-term competitiveness and resilience (Sharma et al., 2020). However, the path from a linear "take-make-dispose" model to a circular and green economy is complex, particularly for resource-constrained MSMEs.

MSMEs face unique and disproportionate challenges in adopting sustainable practices. Foremost among these are significant financial barriers, including high upfront costs for green technologies, limited access to dedicated green financing, and uncertain returns on investment (Kirchherr et al., 2018; Kumar et al., 2022). The COVID-19 pandemic further exacerbated these financial strains, revealing vulnerabilities in traditional supply chains and underscoring the need for more resilient, sustainable business models (Majumdar et al., 2020; Engidaw, 2022). Concurrently, the rapid advancement of digital technologies presents both a challenge and an unprecedented opportunity. Digital tools can enhance resource efficiency, optimize supply chains, and open new markets for sustainable products, thereby potentially alleviating some financial burdens (Martínez-Peláez et al., 2023; Sánchez-García et al., 2023).

Despite growing academic interest in the circular economy and MSMEs, a critical research gap persists in understanding the specific *financial strategies* that enable this transition. Existing literature extensively documents barriers (Kirchherr et al., 2018; Attiany et al., 2022) and the role of technology (Zamani, 2022), but few studies holistically examine how MSMEs strategically navigate financial constraints to fund green initiatives. Furthermore, the interplay between financial strategy, digital adoption, and stakeholder collaboration in driving the green transition remains underexplored (Rodríguez-Espíndola et al., 2022; Suchek et al., 2022).

This study aims to bridge this gap by investigating the following research questions:

1. What are the primary financial strategies employed by MSMEs to support their transition to a green economy?
2. How do digital technology adoption and stakeholder collaboration influence the effectiveness of these financial strategies?
3. What are the key perceived financial barriers, and how do they vary across different sectors and sizes of MSMEs?

By answering these questions, this research seeks to provide actionable insights for MSME owners, financial institutions, and policymakers, contributing to a more inclusive and effective transition towards a sustainable economic future.

2. Methods

This research employed a quantitative, deductive approach utilizing a cross-sectional survey design. The primary objective was to empirically test relationships between financial strategies, enabling factors, and the perceived success of the green transition among MSMEs.

The target population comprised owners and senior managers of MSMEs in the manufacturing and service sectors, with operations consciously involved in or planning sustainability initiatives. A purposive sampling technique was used to ensure respondents had relevant experience. Data was collected through a structured online questionnaire distributed via industry associations and professional networks. A total of 187 responses were received, of which 150 were complete and usable for analysis, yielding a response rate suitable for the analytical techniques employed. The sample consisted of 42% micro-enterprises, 35% small enterprises, and 23% medium enterprises, with 55% operating in manufacturing and 45% in services.

The survey instrument was developed based on a comprehensive review of literature on circular economy barriers (Kirchherr et al., 2018), digital transformation (Martínez-Peláez et al., 2023), and sustainable SME performance (Rodríguez-Espíndola et al., 2022). It contained four main sections: (1) Demographic and firmographic data, (2) Assessment of financial strategies (e.g., use of green loans, internal capital reallocation, crowdfunding) on a 5-point Likert scale, (3) Measurement of enabling factors (digital technology use, stakeholder collaboration, regulatory perception), and (4) The dependent variable, "Green Transition Success," measured as a composite index of perceived improvements in environmental performance, cost savings from efficiency, and new market opportunities over the past three years. Content validity was established through expert review, and reliability was confirmed with Cronbach's Alpha scores above 0.7 for all constructs.

Data analysis was conducted using SPSS software. Descriptive statistics (frequencies, means, standard deviations) were used to profile the sample and summarize key variables. To test the hypothesized relationships, a multiple linear regression analysis was performed. The regression model specified Green Transition Success as the dependent variable, with independent variables including Access to Green Finance, Digital Technology Adoption, Stakeholder Collaboration, Firm Size, and Sector. Assumptions of regression (linearity, homoscedasticity, normality of residuals, absence of multicollinearity) were tested and met.

3. Results and Discussion

The analysis of survey data revealed significant insights into the financial strategies and contextual factors influencing the green transition of MSMEs. Descriptive statistics indicated that while awareness of green economy principles was moderately high (mean = 3.8/5.0), the actual implementation of comprehensive financial strategies lagged (mean = 2.9/5.0).

Table 1: Descriptive Statistics of Key Variables (N=150)

Variable	Mean	Std. Deviation	Min	Max
Green Transition Success (Index)	3.45	0.89	1.50	5.00
Access to Green Finance	2.95	1.12	1.00	5.00
Digital Technology Adoption	3.60	1.05	1.00	5.00
Stakeholder Collaboration	3.25	1.08	1.00	5.00
Perceived Regulatory Support	2.80	1.20	1.00	5.00
Internal Capital Reallocation	3.10	1.15	1.00	5.00

Table 1 shows that Digital Technology Adoption received the highest mean score, suggesting MSMEs are actively engaging with digital tools. However, Access to Green Finance and Perceived Regulatory Support scored the lowest, highlighting critical systemic barriers.

To identify the determinants of a successful transition, a multiple linear regression was performed. The overall model was statistically significant ($F(5, 144) = 18.72$, $p < 0.001$), explaining 52.3% of the variance in Green Transition Success (Adjusted $R^2 = 0.523$).

Table 2: Multiple Linear Regression Results (Dependent Variable: Green Transition Success)

Independent Variable	Unstandardized B	Std. Error	Standardized Beta (β)	t-value	p-value
(Constant)	0.751	0.245		3.065	0.003
Access to Green Finance	**0.335**	**0.062**	**0.421**	**5.403**	**0.000**
Digital Technology Adoption	**0.235**	**0.058**	**0.312**	**4.052**	**0.000**
Stakeholder Collaboration	**0.192**	**0.056**	**0.275**	**3.429**	**0.001**
Firm Size (Ref: Micro)					
Small	0.185	0.102	0.115	1.814	0.072
Medium	0.301	0.125	0.162	2.408	0.017

Independent Variable	Unstandardized B	Std. Error	Standardized Beta (β)	t-value	p-value
Sector (Service=1)	0.088	0.089	0.062	0.989	0.324

*$p < 0.01$, $p < 0.05$

The regression results in Table 2 reveal three statistically significant positive predictors at the $p<0.01$ level. **Access to Green Finance** emerged as the strongest predictor ($\beta = 0.421$, $p < 0.001$), confirming its pivotal role. **Digital Technology Adoption** ($\beta = 0.312$, $p < 0.001$) and **Stakeholder Collaboration** ($\beta = 0.275$, $p = 0.001$) were also highly significant. Firm size showed a notable effect, with medium enterprises demonstrating a significant advantage over micro-enterprises ($p < 0.05$). The economic sector (manufacturing vs. services) did not show a significant effect in this model.

4. Discussion

The findings of this study offer a nuanced understanding of the financial ecosystem required for MSMEs to thrive in a green economy. The paramount importance of **Access to Green Finance** aligns with prior research identifying capital constraints as a primary barrier to circular economy adoption (Kirchherr et al., 2018; Sharma et al., 2020). Our results extend this understanding by quantifying its relative strength as a driver of transition success. This underscores a critical market failure: traditional financial institutions often perceive green investments in MSMEs as high-risk, leading to credit rationing. Therefore, developing de-risking instruments, blended finance models, and dedicated green credit lines is not just supportive but essential for transition at scale (UNEP FI, 2022).

The significant role of **Digital Technology Adoption** corroborates the growing literature on digital transformation as an enabler of sustainability (Martínez-Peláez et al., 2023; Sánchez-García et al., 2023). For MSMEs, digital tools serve a dual financial purpose: they reduce costs through improved resource efficiency (e.g., IoT for energy management) and create new revenue streams (e.g., platforms for product-life extension). This finding suggests that financial strategies should not be viewed in isolation but as integrated with technological investment. An MSME investing in a cloud-based supply chain monitoring system may achieve sufficient operational savings to self-fund other green initiatives, thereby partially circumventing external financing barriers (Cueto et al., 2022).

The positive impact of **Stakeholder Collaboration** highlights the relational dimension of financial strategy. Successful MSMEs do not transition alone. Collaboration with suppliers for greener inputs, with customers willing to pay a premium for sustainable products, and with research institutions for innovation reduces both cost and risk (Rodríguez-Espíndola et al., 2022; Govindan et al., 2020). These collaborations can lead to shared investments, access to partners' resources, and enhanced credibility, which in turn improves access to finance. This creates a virtuous cycle where collaboration strengthens financial capacity, which enables further green investments.

The analysis also reveals persistent challenges. The low score for **Perceived Regulatory Support** indicates a significant policy gap. While large corporations may navigate complex environmental regulations, MSMEs often lack the capacity to do so. The absence of clear, consistent, and incentivizing policies—such as tax breaks for green equipment or simplified green certification—increases perceived risk and stifles investment (Kumar et al., 2022). Furthermore, the advantage held by medium-sized enterprises over micro-enterprises points to an internal capacity gap. Smaller firms may lack the financial management expertise to develop compelling business cases for green lenders or to navigate the landscape of available grants and green funds.

These findings must be interpreted considering the study's limitations. The use of a perceptual measure for the dependent variable, while common, may not capture objective performance metrics. The cross-sectional design limits causal inference. Future research should employ longitudinal studies to trace the evolution of financial strategies over time and use mixed methods to gain deeper qualitative insights into how successful MSMEs orchestrate finance, technology, and relationships.

4. Conclusion

This study concludes that the transition of MSMEs to a green economy is fundamentally a strategic financial challenge, mediated by technological capability and collaborative networks. The most successful MSMEs are those that proactively develop integrated strategies, viewing green finance not as a cost but as an investment in efficiency, innovation, and market positioning. They leverage digital tools to improve their financial and environmental performance simultaneously and build strategic alliances to share risks and resources.

The implications are twofold. For **policymakers**, there is an urgent need to move beyond awareness campaigns to concrete financial and technical support systems. This includes creating green credit guarantee schemes, offering fiscal incentives for digital and green asset procurement, and fostering innovation clusters that connect MSMEs with financiers, technologists, and markets. For **MSMEs and their advisors**, the recommendation is to build internal financial literacy around green opportunities, conduct thorough audits of resource inefficiencies that technology can address, and actively seek collaborative partnerships.

Ultimately, enabling MSMEs' green transition is not merely an environmental imperative but an economic one. By unlocking their potential through targeted financial strategies, we can drive inclusive, resilient, and sustainable economic growth.

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