



Assessing the Influence of Green Finance on the Financial Sustainability Performance of Small and Medium Enterprises (SMEs): Comparative Analysis of Malaysia and Indonesia

Ali Zainal Abidin¹, Sonia Lohana², Kenny Pradipta Montoya Putra Pratama¹

¹ Faculty of Economics and Business, Universitas Muhammadiyah Surakarta, Central Java – 57169, Indonesia

² Faculty of Technology Management & Business, Universiti Tun Hussein Onn Malaysia, Parit Raja, 86400, Batu Pahat, Johor, Malaysia

aza200@ums.ac.id

Abstract. In response to global environmental concerns and the growing emphasis on sustainability, small and medium-sized enterprises (SMEs) have emerged as significant players in promoting environmentally responsible practices. This paper investigates the impact of green finance on the financial sustainability performance of SMEs, with a specific focus on Malaysia and Indonesia, two prominent Southeast Asian economies. Through a comparative analysis, the study examines the challenges and opportunities encountered by SMEs in each country as they navigate the landscape of green finance, highlighting key factors influencing adoption rates and outcomes. Utilizing self-administered online questionnaires, data were collected from 212 owner-managers in Malaysia and 123 owner-managers in Indonesia. Statistical analyses using SPSS and Smart PLS-SEM software were conducted to test the hypotheses and explore the mechanisms through which green finance influences sustainability performance among SMEs. This research contributes to Sustainable Development Goal 13, "climate action," by providing insights into how SMEs in Malaysia and Indonesia engage with green finance to enhance their financial sustainability performance. By identifying the drivers and barriers associated with green finance adoption, this study offers valuable implications for policymakers, financial institutions, and SMEs seeking to promote environmentally responsible practices and achieve sustainable development goals.

Keywords: Green finance, sustainability performance, SMEs, Malaysia, Indonesia

1 Introduction

In the contemporary global landscape, the imperative to foster sustainability practices has become increasingly vital, particularly within the Small and Medium Enterprises (SMEs) sector. Green finance initiatives emerge as pivotal, bridging financial support with environmentally responsible business conduct. Understanding the significance of these initiatives is crucial in comprehending the evolving dynamics of sustainable development [20]. In Southeast Asia, Malaysia and Indonesia are economic powerhouses with vibrant SME sectors. These nations have witnessed the gradual integration of green finance initiatives to align economic growth with ecological responsibility [36]. Green finance initiatives have emerged as a critical tool for addressing environmental challenges while fostering sustainable economic growth [50]. With the increasing urgency to combat climate change and promote sustainable development, governments and financial institutions worldwide have implemented various strategies to incentivize investments in environmentally friendly projects and practices [21]. Small and medium enterprises (SMEs) play a vital role in driving economic growth and job creation in many countries. However, they often face challenges in accessing the financial resources needed to adopt sustainable practices [1] [50]. Consequently, there is a growing interest in understanding the impact of green finance initiatives on sustainability practices within the SME sector. This paper aims to assess the influence of green finance on the financial sustainability performance within SMEs, focusing on the Southeast Asian countries of Malaysia and Indonesia.

2 Literature Review and Hypothesis Development

2.1 Triple Bottom Line (TBL) as a Conceptual Framework

One The Bottom Line (TBL) is a term that encapsulates the essential financial outcome of an organization's operations, reflecting its net profit after deducting all expenses from total revenue. It serves as a foundational metric for assessing a business's financial strength and profitability. TBL goes beyond financial considerations and incorporates three vital dimensions: social, environmental, and economic [15][51]. This framework recognizes that a business's financial profitability should not solely define its success. It highlights the importance of collectively evaluating a company's impact on society, the environment, and its financial performance. TBL underscores the interconnectedness of these dimensions and encourages organizations to adopt a more balanced and responsible approach that addresses a broader spectrum of stakeholders and long-term sustainability [4]. Therefore, the TBL framework is employed to explain how the social, economic, and environmental dimensions of green financing affect sustainability performance in SMEs, as shown in Figure 1.

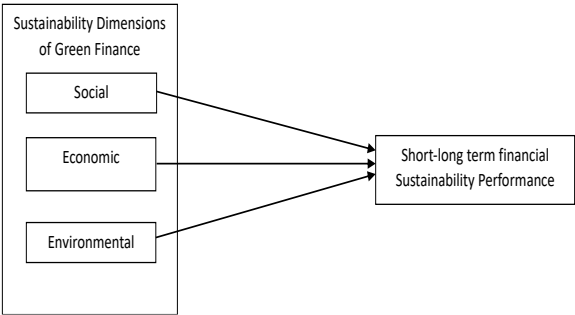


Figure 1. Conceptual Framework

2.2 Green Finance and Its Dimensions

Green finance combines different methods to enhance the monetary system's economic, social, and environmental performance [54]. Therefore, green finance pertains to the significance of public and private initiatives that contribute to establishing an unpolluted environment. It further underscores the consequences of climate change and pollution on human well-being while demonstrating the societal advantages and enduring gains inherent in supporting such financial endeavors [23]. The literature emphasizes the significance of green finance as a critical component of sustainable banking and its potential positive effects on economic development [2]. Banks play a crucial role in promoting green finance by providing financial services and products that support environmentally sustainable investments, encouraging clients to adopt more sustainable practices, and setting sustainability criteria for their lending activities and investment portfolios [54]. Green finance encompasses a range of instruments, including green bonds, green loans, and green equity which provide funding for environmentally friendly projects and businesses. GF involves multiple approaches, including microfinance, sustainable funds, benefit assets, active ownership, credits for sustainable development, and financial system change [35]. It has a profound impact on developing sustainable businesses and companies globally. By integrating (ESG) considerations into investment-related decisions, green finance is a financial strategy focusing on sustainable development, environmental protection, and shifting to a low-emission economy [38]. However, several barriers exist, including inconsistent reporting standards, lack of policy formulation, incorporation of environmental issues, and insufficient social and environmental awareness. Nonetheless, by funding eco-friendly initiatives, GF can play a vital role in achieving banks' sustainability objectives [26]. Furthermore, it can mobilize resources to accomplish the Sustainable Development Goals, reduce greenhouse gas emissions, manage resources more effectively, and safeguard ecosystem services and biodiversity through funding environmentally friendly initiatives and enterprises [11].

2.3 Sustainability Performance

The concept of the Sustainable Corporation has been widely discussed and researched by sustainability professionals and academics and has become an essential topic in the field of sustainable development [15][27][53]. The idea was first introduced by John Elkington [10], emphasizing the importance of social responsibility, environmental care, and resource efficiency in business operations. Moreover, the researcher suggested that companies should integrate sustainability practices into their core business operations to achieve a balance between economic development, environmental conservation, and social well-being [49]. This requires taking a long-term view, recognizing sustainability risks [34]. and opportunities throughout the company's value chain, and consistently improving via innovation [6]. The Sustainability Performance also highlights the importance of accountability and transparency when communicating with stakeholders [15]. By including economic, social, and environmental factors in organizational strategy, the (SP) offers a thorough method for attaining sustainable development.

2.4 Green Finance and Sustainability Performance

The COVID-19 Green finance refers to financial products and services that are designed to promote environmentally sustainable economic growth [48]. By investing in sustainable initiatives, companies can enhance sustainability outcomes while creating long-term financial rewards. One efficient green financing method is the issuance of green bonds, which are debt instruments that are expressly related to supporting environmentally beneficial initiatives [23], [32]. The relationship between green finance and sustainability performance deserves a significant amount of attention from those who are dedicated to creating a more sustainable future [46]. Green finance has emerged as a critical tool in promoting sustainability initiatives, particularly among Small and Medium-sized Enterprises (SMEs) [1]. Research indicates that green finance encompasses various financial instruments and mechanisms to support environmentally friendly projects and businesses [5]. These instruments include loans, grants, and investment opportunities tailored to promote sustainable practices within SMEs. Incentives offered through green finance, such as reduced interest rates or extended repayment periods, encourage SMEs to adopt environmentally sustainable measures [22]. Several drivers prompt SMEs to adopt green finance initiatives. Regulatory pressures, including stringent environmental regulations and policies, compel SMEs to embrace sustainable practices to comply with legal requirements [24]. Growing consumer demand for sustainable products and services also creates market opportunities for SMEs, motivating them to seek green finance options [52]. Furthermore, enhancing reputation and brand image through sustainability initiatives can bolster SMEs' competitiveness and market share [42]. Studies have demonstrated a positive relationship between green finance adoption and sustainability performance among SMEs. SMEs accessing green finance have shown reduced carbon emissions, energy consumption, and waste generation, contributing to improved environmental sustainability [22]. Moreover, investments facilitated by green finance, such as

renewable energy and eco-friendly production processes, have led to cost savings and enhanced profitability for SMEs [5]. Additionally, incorporating sustainability practices through green finance initiatives aligns with social responsibility objectives, including job creation and community support [36][52]. Furthermore, a recent investigation into developing economies revealed that green finance has the potential to be a key factor in encouraging sustainable development. However, it is crucial to address the significant obstacles in its implementation [25]. The relationship between green finance and sustainability performance is significant, with research showing that companies that employ green finance techniques often perform better in terms of sustainability, therefore companies need to consider these factors when developing their sustainability strategies [54].

2.5 Hypothesis Development

The study aims to investigate the relationship between the dimensions of green finance (social, economic, and environmental) and the sustainability performance of Small and Medium-sized Enterprises (SMEs). Three hypotheses are formulated to guide the research:

This hypothesis suggests that factors such as social responsibility, community engagement, and stakeholder relations, inherent in social aspects of green finance, will positively influence SMEs' sustainability performance. Specifically, SMEs that prioritize social responsibility initiatives and engage with their communities through environmentally friendly projects and practices are expected to exhibit higher levels of sustainability performance.

H₁: The social, act as drivers for green finance, positively impacting the sustainability performance of SMEs.

This hypothesis posits that economic incentives and benefits associated with green finance, such as cost savings, access to capital, and financial returns from sustainable investments, will contribute to enhancing SMEs' sustainability performance. SMEs that effectively utilize green finance mechanisms to improve resource efficiency, reduce operational costs, and enhance profitability are expected to demonstrate higher levels of sustainability performance.

H₂: The economic for green finance, positively impacts the sustainability performance of SMEs.

This hypothesis suggests that environmental considerations embedded within green finance, including carbon footprint reduction, energy efficiency, and adoption of sustainable technologies, will lead to improved sustainability performance among SMEs. SMEs that integrate environmentally friendly practices into their operations, supply chain, and product offerings are anticipated to achieve higher levels of sustainability performance.

H₃: The environment for green finance, positively impacts the sustainability of performance of SMEs.

Through empirical analysis and statistical testing, this study seeks to validate these hypotheses and provide insights into the role of green finance in enhancing the sustainability performance of SMEs. By examining the interplay between social, economic, and environmental dimensions of green finance, the research aims to contribute to a better understanding of how SMEs can leverage green finance strategies to achieve both financial viability and environmental sustainability.

3 Methodology

3.1 Data Collection and Sampling

We used a quantitative survey study methodology to evaluate our hypotheses about the correlations between the variables [14]. The items in the questionnaire were modified from research that had been done in the past, and answers to several statements were assessed using a 5-point Likert scale to assist in establishing the reliability and validity of the data [17]. Even before the questionnaire was sent out to the respondents, it was reviewed by academics and professionals in organizations to ensure that it was legitimate on the surface and that the selected questions were appropriate for determining the desired ideas. After that, research participants, working in conjunction with the owner-managers in SMEs, distributed the survey to the organizations that had shown their interested. A non-probabilistic sampling method was employed to select participants for the study. The sample consisted of SMEs in Malaysia and Indonesia selected to participate in the research. A total of 300 questionnaires were distributed to participants, of which 235 were returned it 112 responses received from Indonesia and 123 from Malaysia. The collected data from the questionnaires was analyzed to determine the impact of GF on the sustainability performance of SMEs in Malaysia and Indonesia.

Table 1. Demographic Information of the Samples of Malaysia and Indonesia

Characteristics	Malaysia (123)	Indonesia (112)
Gender		
Male	76	71
Female	47	41
Age		
Less than 30	26	24
From 30 to 40	72	64
From 40 to 50	24	23
More than 50	1	1

Year of experience		
less than 1 year	27	25
1-4 years	72	22
4-7 years	23	64
8-11 years	1	1
SME operating		
Manufacturing	34	34
Services	81	70
Agriculture	8	8
Number of Employees		
1-10	8	8
11-50	22	19
51-100	54	48
More than 100	39	37

4 **Data Analysis and Results**

Partial least squares structural equation modeling (PLS-SEM) was used on the data to verify the study's postulated model once it had been evaluated [16]. The fact that it is based on variance, as opposed to covariance, lends credence to the idea that it is suitable. PLS-SEM was chosen to analyze the research model for the reasons detailed below. First, most of the constructs studied in applied science and research are design constructs [18], which means that the variance-based composite measurement model is the one most suited to deal with these constructs [45]. Second, PLS-SEM estimates the model based on composites, enabling it to give consistent estimates while allowing for the integration of explanatory and prediction views for exploratory study [16][41]. PLS-SEM is recommended to avoid assessment bias due to the unidentified nature of the data because it does not necessitate the normality of the data, even though both covariance-based and variance-based modeling were used in the past studies [9][29]. This is because PLS-SEM does not need the normality of the data [40]. Fourth, PLS-SEM could be used to conduct multi-group analysis [16]; consequently, SmartPLS version 3.3.7 has been used to conduct the research and analysis, and the multi-group test was carried out to make a comparison of the complexity of and map the structural interrelationships among, the factors that affect the sustainability performance in SMEs of Malaysia and Indonesia.

4.1 Measurement of Validity and Reliability

Using factor loadings, composite reliability (CR), and average variance extracted (AVE) for the pooled sample of sustainability performance in SMEs of Malaysia and Indonesia helps in establishing the convergent validity of the measures [16]. This is done for both countries' performance samples. According to the findings shown in Table 2, each of the factor loadings of the items is more than the suggested value of 0.5. In addition to this, the CR of every build is higher than 0.7, and the AVE values of every construct are higher than the cutoff value of 0.5 [8]. Therefore, convergent validity has been demonstrated for the whole sample that was taken from the performance of SMEs in Malaysia and Indonesia independently.

Table 2. Assessment of Measurement Model, Factor Loading, CR, and AVE

Constructs	Items	Sample: Malaysia, n = 123				Sample: Indonesia, n = 112			
		Loading	Cronbach's Alpha	CR	AVE	Loading	Cronbach's Alpha	CR	AVE
Social	Soc1	0.797	0.810	0.814	0.636	0.937	0.889	0.904	0.749
	Soc2	0.796				0.820			
	Soc3	0.773				0.829			
	Soc4	0.822				0.872			
Economic	Eco1	0.900	0.834	0.854	0.666	0.923	0.844	0.863	0.692
	Eco2	0.726				0.849			
	Eco3	0.855				0.887			
	Eco4	0.773				0.639			
Environmental	Env1	0.788	0.851	0.857	0.692	0.815	0.824	0.850	0.650
	Env2	0.896				0.774			
	Env3	0.802				0.834			
	Env4	0.838				0.800			
Sustainability Performance	SP1	0.836	0.845	0.865	0.629	0.749	0.751	0.867	0.545
	SP2	0.833				0.797			
	SP3	0.549				0.861			
	SP4	0.831				0.866			
	SP5	0.873				0.811			

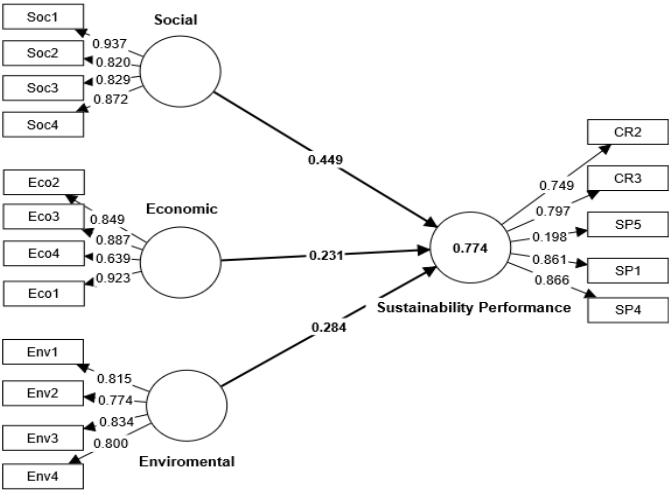


Figure 2. Measurement Model Malaysian Sample: 123

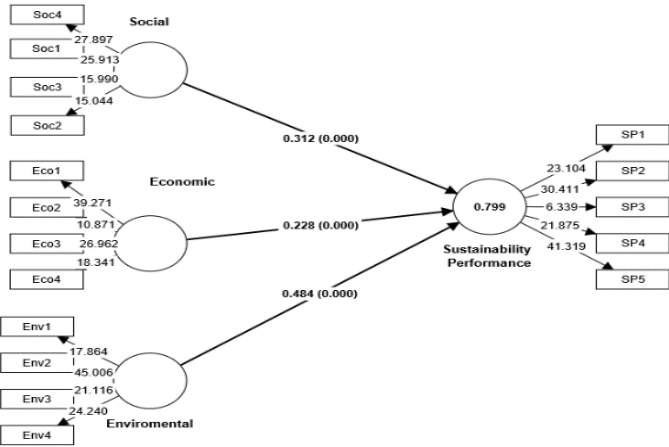


Figure 3. Measurement Model Indonesia Sample 112

4.2 Measurement of Discriminant Validity

The Fornell-Larcker criteria are also used to evaluate the discriminant validity of the study as the second criterion [13]. This technique examines the relationship between the average variance extracted (AVE) square root and the correlation between latent constructs [19]. It is more important for a latent construct to adequately explain the variation of its own indicator than it is to explain the variation of other latent constructs adequately. As a result, the value of each construct's AVE's square root should be higher than the correlations with the various latent constructs [17]. The Fornell-Larcker (Table

3) criteria for determining discriminant validity were used in this investigation of sustainability performance in SMEs in Malaysia and Indonesia, respectively.

Table 3. Measurement of Discriminant Validity Fornell-Larcker Criteria

Sample: Malaysia (123)	Economic	Environmental	Social	Sustainability Performance
Economic	0.816			
Environmental	0.499	0.832		
Social	0.534	0.762	0.797	
Sustainability Performance	0.636	0.835	0.802	0.793
Sample: Indonesia (112)	Economic	Environmental	Social	Sustainability Performance
Economic	0.832			
Environmental	0.675	0.806		
Social	0.723	0.789	0.866	
Sustainability Performance	0.746	0.793	0.839	0.738

4.3 Measurement of the Structural Model

After the first phase of PLS-SEM, known as the measurement model, was achieved, the second step, which consisted of testing the hypotheses about the structural model, was carried out. During this stage, each of the hypotheses was given careful consideration to see whether the research supports the validity of these hypotheses [29][33]. It was anticipated that a t-value of 1.96 and a p-value of less than 0.05 would be attained. The validity of the link was determined to exist if its t-value was 1.96 or more. In such a case, the proposition was not accepted. In contrast, the results of this investigation showed that every hypothesis had a t-value that was more than 1.96. The researcher has also considered beta values for suggested relationships; beta values are often in the range of -1 to +1. It is regarded as a significant positive association if the beta values are near to plus signs (+), and it is considered to be a significant negative relationship if the beta values are close to minus signs (-). The bootstrapping approach, with a sampling of 235 to determine the significance of the path coefficients, is used to test the hypotheses suggesting causal links between components in the model. This helps to ensure that the hypotheses are accurate [16][39][43]. Tables 4 give the findings on the direct path coefficients, while Table 4 summarizes the findings. These findings pertain to the whole dataset and those for Malaysia and Indonesia.

Table 4. Measurement of Structural Model Direct and Indirect Hypothesis Relationship

Sample: 235	Hyp	Paths	β -values	Std	t-value	p-value	Decision
Malaysia	H1	Sco -> SP	0.312	0.078	3.976	0.000	Supported
	H2	Eco -> SP	0.228	0.058	3.947	0.000	Supported
	H3	Env -> SP	0.484	0.085	5.694	0.000	Supported
Indonesia	H1	Sco -> SP	0.449	0.055	8.231	0.000	Supported
	H2	Eco -> SP	0.231	0.054	4.244	0.000	Supported
	H3	Env -> SP	0.284	0.050	5.672	0.000	Supported

Regarding the relationship between Sco and SP, the results are positive and significant for both samples, Malaysia ($\beta = 0.312$, $t = 3.976$) and Indonesia ($\beta = 0.449$, $t = 8.231$); thus, hypothesis H1 is fully supported. Similarly, Eco is positively and significantly related to SP across both samples including Malaysia and Indonesia: ($\beta = 0.228$, $t = 3.947$, $\beta = 0.231$, $t = 4.244$); hence, H2 is fully supported. More importantly, the Env is positively and significantly related to the SP of both samples: ($\beta = 0.484$, $t = 8.231$, $\beta = 0.284$, $t = 5.672$), as a result fully supporting H3.

5 Discussion and Conclusion

The findings of this study reveal significant positive relationships between the dimensions of green finance (social, economic, and environmental) and the financial sustainability performance (SP) of Small and Medium Enterprises (SMEs) in both Malaysia and Indonesia. Specifically, the results indicate that social factors (Sco), economic factors (Eco), and environmental factors (Env) all contribute significantly to enhancing the financial sustainability performance of SMEs in both countries. These findings align with previous research indicating the importance of green finance in promoting sustainability practices among SMEs [3][23][37][47]. The positive and significant relationship between social factors and financial sustainability performance suggests that initiatives focused on social responsibility, community engagement, and stakeholder relations play a crucial role in enhancing SMEs' sustainability outcomes. This finding underscores the importance of SMEs integrating social considerations into their business strategies to improve financial performance while fulfilling their social responsibilities [7][28].

Similarly, the positive relationship between economic factors and financial sustainability performance highlights the significance of economic incentives and the benefits of green finance in driving SMEs towards sustainable practices. By reducing operational costs, accessing capital, and generating financial returns from sustainable investments, SMEs can enhance their financial sustainability while contributing to environmental protection and social welfare [12][30][54].

Furthermore, the positive and significant relationship between environmental factors and financial sustainability performance underscores the importance of

environmental considerations in driving SMEs' sustainability outcomes. By adopting environmentally friendly practices, reducing carbon footprint, and embracing sustainable technologies, SMEs can improve their financial performance and contribute to mitigating climate change and preserving natural resources [44][54].

In conclusion, this study provides empirical evidence of the positive influence of green finance on the financial sustainability performance of SMEs in Malaysia and Indonesia. The results support the hypotheses that social, economic, and environmental factors significantly enhance SMEs' financial sustainability outcomes. These findings underscore the importance of integrating green finance practices into SMEs' business strategies to achieve financial viability and environmental sustainability. By aligning with Sustainable Development Goal 13 (climate action), this research contributes to the global effort towards promoting sustainable development and addressing climate change. The implications of this study extend to policymakers, financial institutions, SMEs, and the academic community, providing valuable insights into the mechanisms through which green finance can drive financial sustainability performance among SMEs in diverse socio-economic contexts. Through further research and collaborative efforts, stakeholders can continue to explore innovative strategies and policy interventions to facilitate the adoption of green finance practices among SMEs, thereby advancing sustainable development goals and ensuring a more resilient and environmentally responsible future.

6 Implications of the Study

The implications of the comparative analysis on the influence of green finance on the financial sustainability performance of Small and Medium Enterprises (SMEs) in Malaysia and Indonesia are multifaceted and hold significance for various stakeholders. **Policy Implications:** The findings provide policymakers in Malaysia and Indonesia with valuable insights into the effectiveness of current policies and regulations related to green finance. Policymakers can use this information to tailor policies that incentivize SMEs to adopt green finance practices more effectively, fostering a conducive environment for sustainable development. **Financial Institutions:** Financial institutions can leverage the results of this study to develop tailored financial products and services that meet the specific needs of SMEs engaged in environmentally responsible practices. By understanding the challenges and opportunities SMEs face in accessing green finance, financial institutions can design innovative financing solutions that promote sustainability while ensuring profitability. **SME Owners and Managers:** The study offers SME owners and managers in Malaysia and Indonesia valuable insights into the benefits of integrating green finance into their business strategies. By understanding the positive impact of green finance on financial sustainability performance, SMEs can make informed decisions regarding resource allocation and investment priorities, thereby enhancing their long-term competitiveness and resilience. **Sustainable Development Goals (SDGs):** The research aligns with Sustainable Development Goal 13, "climate action," by providing empirical evidence of the role of green finance in mitigating climate change and promoting environmental sustainability. The findings

underscore the importance of integrating climate action into business practices and financial decision-making processes to achieve broader sustainability objectives outlined in the SDGs. **Academic Community:** The study contributes to the academic literature on green finance and sustainability by providing empirical evidence from two Southeast Asian economies. Researchers can build upon these findings to further explore how green finance influences SME sustainability performance and investigate potential factors that may influence adoption rates in different contexts. The comparative analysis offers actionable insights that can inform strategic decision-making, drive policy reforms, and promote collaborative efforts among stakeholders to advance sustainable development agendas in Malaysia, Indonesia, and beyond.

7 Limitations And Future Study

7.1 Limitations

Despite the significant findings and contributions of this study, several limitations should be acknowledged:

1. Sample Size and Representation: The study's sample size, although sufficient for statistical analysis, may not fully represent the diverse landscape of SMEs in Malaysia and Indonesia. Future studies could aim for larger and more diverse samples to enhance the generalizability of the findings.

2. Cross-sectional Nature: The study utilized cross-sectional data, which limits the ability to establish causality between green finance dimensions and financial sustainability performance. Longitudinal studies could provide deeper insights into the temporal relationships and dynamics between these variables.

3. Measurement Issues: While the study utilized established scales to measure green finance dimensions and financial sustainability performance, there may be limitations in the measurement validity and reliability. Future studies could employ alternative or complementary measurement approaches to enhance the robustness of the findings.

7.2 Directions for Future Research

1. Longitudinal Studies: Future research could employ longitudinal designs to examine the dynamic relationships between green finance dimensions and SME sustainability performance over time. Longitudinal studies would enable researchers to assess the causal effects and temporal dynamics of these relationships.

2. Qualitative Research: Complementary qualitative research methods, such as interviews and case studies, could provide deeper insights into the underlying mechanisms and contextual factors influencing the relationship between green finance and SME sustainability performance.

3. Sectoral Analysis: Future research could examine how green finance dimensions influence sustainability performance across different industry sectors within SMEs. Sectoral analyses would allow for a more nuanced understanding of the sector-specific challenges and opportunities associated with green finance adoption.

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