Examining the Determinants of Sustainable Performance in SMEs on Belitung Island Using Structural Equation Modeling

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Abstract. This study analyzed the sustainability determinants for small and medium enterprises (SMEs) on Indonesia's Belitung Island Geopark using structural equation modeling (SEM). A survey was conducted with 245 SME practitioners on the island. The results revealed that digital innovation, smart governance, and business capabilities significantly influenced SME sustainability and competitiveness, while government regulations had less impact. Furthermore, competitiveness and collaboration had the strongest direct impacts on sustainable performance. An SME sustainability model is proposed, demonstrating that performance is rooted in competitiveness, collaboration, and capability/innovation, supported by governance. The findings offer practical implications for strengthening SME sustainability through competitiveness and collaboration policies tailored to Belitung Island's context

Keywords: sustainable SMEs, SEM analysis, determinant model, Belitung Island.

1. Introduction

Small and medium-sized enterprises (SMEs) play a vital role in economic growth and job creation. However, their contribution to environmental degradation cannot be ignored. The adoption of sustainable practices by SMEs is crucial for achieving sustainable development goals. Sustainable SMEs are those that operate in an environmentally responsible manner, adhere to social and ethical standards, and ensure economic viability in the long run. Such SMEs help to reduce greenhouse gas emissions, conserve resources, promote renewable energy, and contribute to the well-being of society. Research indicates that sustainable SMEs experience benefits such as enhanced reputation, access to finance, increased customer loyalty, and improved staff retention. For instance, a study by Luo et al. (2019) revealed that sustainable SMEs in China had higher financial performance than their non-sustainable counterparts. Another study by Naradda Gamage et al. (2020) found that sustainable SMEs in the tourism industry in China had better operational efficiency and innovation capability. Furthermore, research by Muthu et al. (2023) showed that sustainable SMEs in the fashion industry had a positive impact on the environment, society, and economy. Therefore, supporting sustainable SMEs is crucial for achieving sustainable development and mitigating the negative impacts of SMEs on the environment and society.

Sustainability is a complex concept that requires a multi-faceted approach for effective implementation. Government regulations can play a critical role in incentivizing and mandating sustainable practices by SMEs. Smart management can help SMEs reduce their environmental footprint, improve resource efficiency, and enhance their social and economic impact. Digital innovation can facilitate the adoption of sustainable practices and enhance transparency in SMEs' operations. Business capability refers to the skills and resources needed by SMEs to implement sustainable practices effectively. Business collaboration can promote knowledge sharing, joint innovation, and collective action among SMEs and other stakeholders. Lastly, competitiveness is crucial for SMEs to thrive in a sustainable economy. Research by Graafland & Bovenberg, (2020) shows that government regulations can improve SMEs' environmental performance. Another study by Onu & Mbohwa (2021) found that smart management practices can lead to cost savings and environmental benefits for SMEs. Research by Kraft et al. (2022) suggests that digital innovation can help SMEs adopt sustainable practices effectively. Moreover, a study by Rehman et al. (2022) highlights the importance of business capability in enhancing SMEs' environmental performance. Finally, research by Prasanna et al. (2019) shows that business collaboration and competitiveness can contribute to the sustainability of SMEs. Therefore, a comprehensive approach xsav considers government regulations, smart management, digital innovation, business capability, business collaboration, and competitiveness is crucial for promoting sustainable SMEs.

Several studies have investigated the determinants of sustainable practices adoption and their impact on SMEs' financial performance and competitiveness. Structural equation modeling (SEM) analysis is commonly used in such studies to explore the complex relationships between variables. For instance, Choi & Lim (2017) used SEM analysis to identify the determinants of sustainable management practices in SMEs in South Korea, while Rodríguez-Espíndola et al. (2018) employed SEM analysis to investigate the factors that influence the adoption of sustainable practices in SMEs in Mexico. Agyabeng-Mensah & Tang (2021) applied SEM analysis to examine the relationship between sustainable practices adoption and SMEs' financial performance. Moreover, Astawa et al. (2021) used SEM analysis to investigate the effect of sustainable supply chain management on the competitive advantage and business performance of SMEs in Bali. Finally, Le et al. (2022) applied SEM analysis to examine the impact of green innovation on sustainable performance in SMEs, with a focus on the role of green supply chain management and green operations management. Therefore, SEM analysis is a useful approach for investigating the adoption of sustainable practices in SMEs and their impact on the environment, society, and economy.

Belitung Island, distinguished as a UNESCO Global Geopark, is set apart by its unique blend of

geographical, economic, and regulatory characteristics. Geographically, it is celebrated for its stunning landscapes and peculiar granite rock formations, characteristic of its position off the east coast of Sumatra, Indonesia. These formations, along with the island's rich biodiversity and tropical climate, define its natural allure. Economically, Belitung has transitioned from its historical roots as a major tin mining hub to a burgeoning center for tourism, attracting both domestic and international visitors drawn to its natural beauty and cultural heritage. This shift is complemented by traditional economic activities like fishing and agriculture, which continue to support the local community. From a regulatory perspective, the island's status as a UNESCO Global Geopark brings with it a commitment to preserving its natural and cultural heritage. This status is supported by both local and national policies focusing on environmental conservation, sustainable tourism, and balanced economic development, with a growing emphasis on community involvement in governance. Together, these facets create a unique tapestry that not only enhances Belitung's appeal as a destination but also underscores its significance in terms of ecological conservation and sustainable development.

Despite the growing interest in sustainable business practices, there remains a significant gap in the empirical understanding of how sustainability factors influence the operations and success of small and medium-sized enterprises (SMEs) within unique environmental contexts such as geoparks or islands. Existing literature predominantly focuses on sustainability in large corporations or in urban settings, leaving a knowledge void concerning SMEs operating in these ecologically sensitive and geographically distinct areas. Furthermore, the use of Structural Equation Modeling (SEM) in analyzing these relationships is underexplored. SEM's capability to identify and quantify the interrelations among multiple sustainability factors could offer profound insights into the complex dynamics at play. This gap is particularly critical given that SMEs constitute a major portion of the global economy and are often key stakeholders in the management and conservation of local ecosystems, especially in geopark and island contexts. These regions typically face unique sustainability challenges, including limited resources, ecological fragility, and dependency on local ecosystems for economic activities such as tourism. The absence of targeted research impedes the development of effective strategies and policies that support the sustainable growth of SMEs in these areas, which is essential for both economic development and environmental preservation. Therefore, in order to fill in the research gap, this study aims to identify (1) factors influencing economic sustainability of SMEs in Belitung island, Indonesia; and (2) a performance determinant model of sustainable SMEs in Belitung, Indonesia. Furthermore, this study attempts to test the following hypotheses.

H1 There is an influence of government regulation, smart governance, digital innovation, and business capabilities on microenterprise business collaboration.

H2 There is an influence of government regulation, smart governance, digital innovation, and business capabilities on the competitiveness of micro-enterprises.

H3 There is an influence of government regulation, smart governance, digital innovation, and business capabilities on the sustainable performance of micro-enterprises.

H4 There is an influence of business collaboration on the sustainable performance of micro-enterprises.

H5 There is an influence of competitiveness on the sustainable performance of microenterprises.

H6 There is an influence of government regulation, smart governance, digital innovation, and business capabilities on sustainable performance through microenterprise business collaboration.

H7 There is an influence of government regulation, smart governance, digital innovation, and business capabilities on sustainable performance through the competitiveness of micro-enterprises.

2. Methods

This study employs a Mixed Methods Research (MMR) research design with an Explanatory Sequential Design strategy, namely a design that uses two phases in which quantitative research results are the main design and qualitative research results are used to explain and make interpretations of quantitative research results (Creswell, 2014) . The cross-sectional study took place in 2022.

2.1. Research Site

This study was conducted in Belitung island as a UNESCO-recognized Geopark which holds a significant position both nationally and internationally. It was designated as a Special Economic Zone (SEZ) nationally, with Tanjung Kelayang being established based on Government Regulation No. 6 of 2016 (Refly & Esti, (2020). In December 2017, the island was declared a National Geopark (Supriatna & Margules, 2022). Subsequently, on April 15, 2021, it was recognized as Belitong UNESCO Global Geopark at the 211th Executive Board of UNESCO (Hawkins, 2022), and its certificate was issued on December 16, 2021. The Small Islands Geopark category is relatively rare in UNESCO Global Geoparks, making Belitung unique. Moreover, Belitung will host this year's G20 meeting, receiving both national and international attention. The geopark concept is based on three diversities, namely geological, biological, and cultural diversity, which can contribute to the improvement of the local community's welfare (Hengky, 2022). Recognizing Belitung Island's sustainable environment and livelihood is crucial. One of the economic foundations of the islands is small and medium enterprises (SMEs).

2.2. Research Participants

As many as 245 SMEs business practitioners served as the respondents of this study. One of the requirements of the participant selection was due to the implementation of smart technology. In order to gain the number of participants as the sample, this study administered purposive sampling.

2.3. Data Collection

In pursuit of a comprehensive exploration into the critical determinants influencing sustainability within Small and Medium-sized Enterprises (SMEs) and in alignment with the proposed hypotheses, a methodologically robust data collection approach was orchestrated. Leveraging the power of two distinct instruments, the investigation commenced with the employment of Structural Equation Modeling (SEM) analysis. This analytical tool facilitated the discernment of the underlying and interconnected factors that wield substantial influence over sustainability within SMEs. SEM's capability to model intricate relationships among variables provided a sophisticated understanding of the intricate dynamics at play, allowing for a more nuanced examination of the research questions. In tandem with the SEM analysis, a series of purposeful Focus Group Discussions (FGDs) were convened, focusing explicitly on the identified pivotal factors. The FGDs not only delved into the micro-level perceptions and experiences of stakeholders but also aimed to conceptualize an optimal sustainable model tailored to the specific context of SMEs. By synergistically employing these two methodological instruments, a comprehensive and enriched perspective unfolded, elucidating both the intricate structural components and the conceptual paradigms that underpin sustainability in SMEs.

The questionnaire design process, especially for developing measurement items and scales for latent variables, is a meticulous and multi-faceted procedure that ensures the collection of reliable and valid data. It begins with defining the latent variables, which are theoretical constructs not directly observable but inferred from measured variables. These variables should be clearly delineated, grounded in theoretical frameworks, and reflective of the research objectives. Following the definition phase, a comprehensive literature review is conducted to identify existing validated measurement items and scales. In cases where suitable items are not available, an initial pool of items is generated based on theoretical constructs. The creation of these items demands careful consideration to ensure they are clear, concise, and accurately representative of the latent variables. The next crucial step is assessing

content validity, typically involving experts in the relevant field. These experts review the items to ensure they are comprehensive and appropriately represent the latent variables. This phase might involve modifying, adding, or deleting items based on expert feedback. Subsequently, a pilot test is conducted with a small sample representative of the target population. The pilot test serves to analyze the reliability and validity of the items, using techniques like Cronbach's Alpha for reliability and Exploratory Factor Analysis (EFA) for construct validity. Based on the pilot test results, items are refined to enhance clarity, reliability, and validity. This step might involve rewording, removing, or adding items. Concurrently, the type of scale for each item is decided. Commonly, scales such as Likert scales are employed, particularly for attitudinal questions. The choice of scale is dictated by the nature of the latent variable and the required measurement precision. The questionnaire is then finalized by arranging the items in a logical and coherent order, ensuring ease of comprehension and response. This final version includes clear instructions and an introduction that explains the study's purpose. Before its full deployment, this version undergoes another round of testing and validation, often using a different sample. Techniques like Confirmatory Factor Analysis (CFA) are employed to validate the measurement model. Throughout this process, the emphasis is on clarity, relevance, and simplicity to ensure effective response rates and data accuracy. Additionally, ethical considerations, including informed consent and the protection of respondents' privacy, are integral to the questionnaire design. This comprehensive approach ensures that the questionnaire effectively captures the nuances of the latent variables under study, providing a solid foundation for meaningful and robust research findings.

2.4. Data Analysis

The recordings and observation sheets of the FGD were interpreted using meaning analysis focusing on which ideal model for sustainable SMEs and what significant factors influencing sustainability in SMEs. In order to conduct data triangulation, this study transcribed the results of the discussion. The factors included are government regulations, smart governance, digital innovation, business capabilities, business collaboration, competitiveness, and sustainable performance.

2.5. The SEM Model Fit

The SEM model fit analysis comprises several steps namely (1) development of theory-based models; (2) development of flowcharts or path diagrams; (3) selecting the type of input matrix and determining the estimated model; (4) model identification and estimation; (5) model goodness of fit; (6) model interpretation and specification (see Figure 1).

Model 1 $\eta_1 = \gamma_{11}\xi_1 + \gamma_{12}\xi_2 + \gamma_{13}\xi_3 + \gamma_{14}\xi_4 + \zeta_1$

Model 2 $\eta_2 = \beta_{21}\eta_1 + \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \gamma_{23}\xi_3 + \gamma_{24}\xi_4 + \zeta_2$

Model 3 $\eta_3 = \beta_{31}\eta_1 + \beta_{32}\eta_2 + \gamma_{31}\xi_1 + \gamma_{32}\xi_2 + \gamma_{33}\xi_3 + \gamma_{34}\xi_4 + \zeta_3$
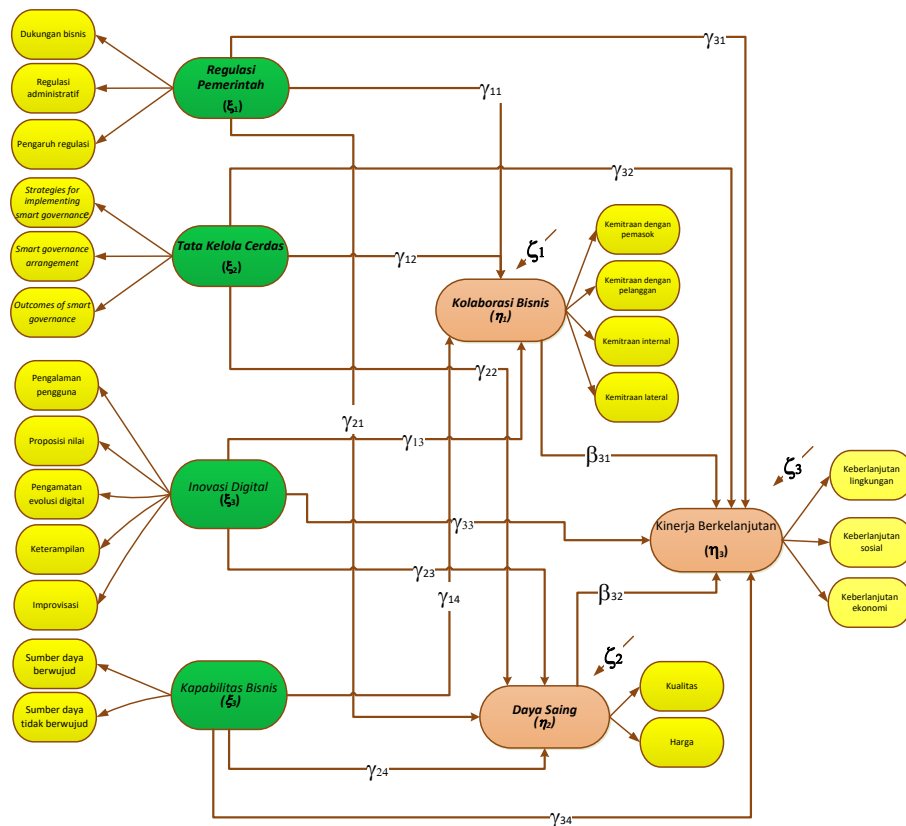
Fig. 1: Path chart of the study.

3. Results and Discussion

3.1. Model Suitability Test

The goodness of fit model aims to test whether the resulting model describes the actual conditions. The hypothesis is:

Ho : The goodness of fit model (the resulting model describes the actual conditions)

Ha : The model is not goodness of fit (the resulting model does not describe the actual conditions)

This section will discuss the results of hypothesis testing using Structural Equation Modeling (SEM). Before the discussion is carried out, the hypothesis will be analyzed for the results of the model suitability test.

Table 1. Goodness of Fit

No	Size of Match Degrees	Value	Acceptable match level	Information
1	Absolute Fit Test			
	Chi Square	2660.90	P -value>0,05	Close Fit
	Normed Chi Square (x2/df)		P -value = 0.59965	
	Goodness of Fit Index (GFI)	0,86	>0,80	Close fit
	Root Mean Square Error of Approximation (RMSEA)	0,000	RMSEA≤ 0,08 (good fit) RMSEA< 0,05 (close-fit)	Close fit
2	Incremental Fit Measures			
	Adjusted Goodness of Fit Ind ex (AGFI)	0,86	AGFI≥ 0,8	Close fit

	Normed Fit Index (NFI)	0.92	NFI ≥ 0.90	Close fit
	Comparative Fit Index (CFI)	0.99	CFI ≥ 0.90	Close fit
3	Parsimonious Fit Measures			
	Parsimonious Normed Fit Index (PNFI)	0.96	PNFI ≥ 0.90	Close fit
	Parsimonious GFI (PGFI)	0.92	PGFI ≥ 0.90	fit

Source: Output LISREL 8.7

Absolute fit size with P-value of 0.59965 greater than 0.05, *Goodness of Fit Indices* (GFI), *Root Mean Square Error of Approximation* (RMSEA) < 0.05. Incremental *fit* size with and *Adjusted Goodness of Fit Ind ex* (AGFI) > 0.80. Similarly, the parsimonious fit size of PNFI and PGFI ≥ 0.90 so that it can be concluded that the research model is fit or paradigm supported by empirical conditions. The following displays the results of model testing using LISREL.
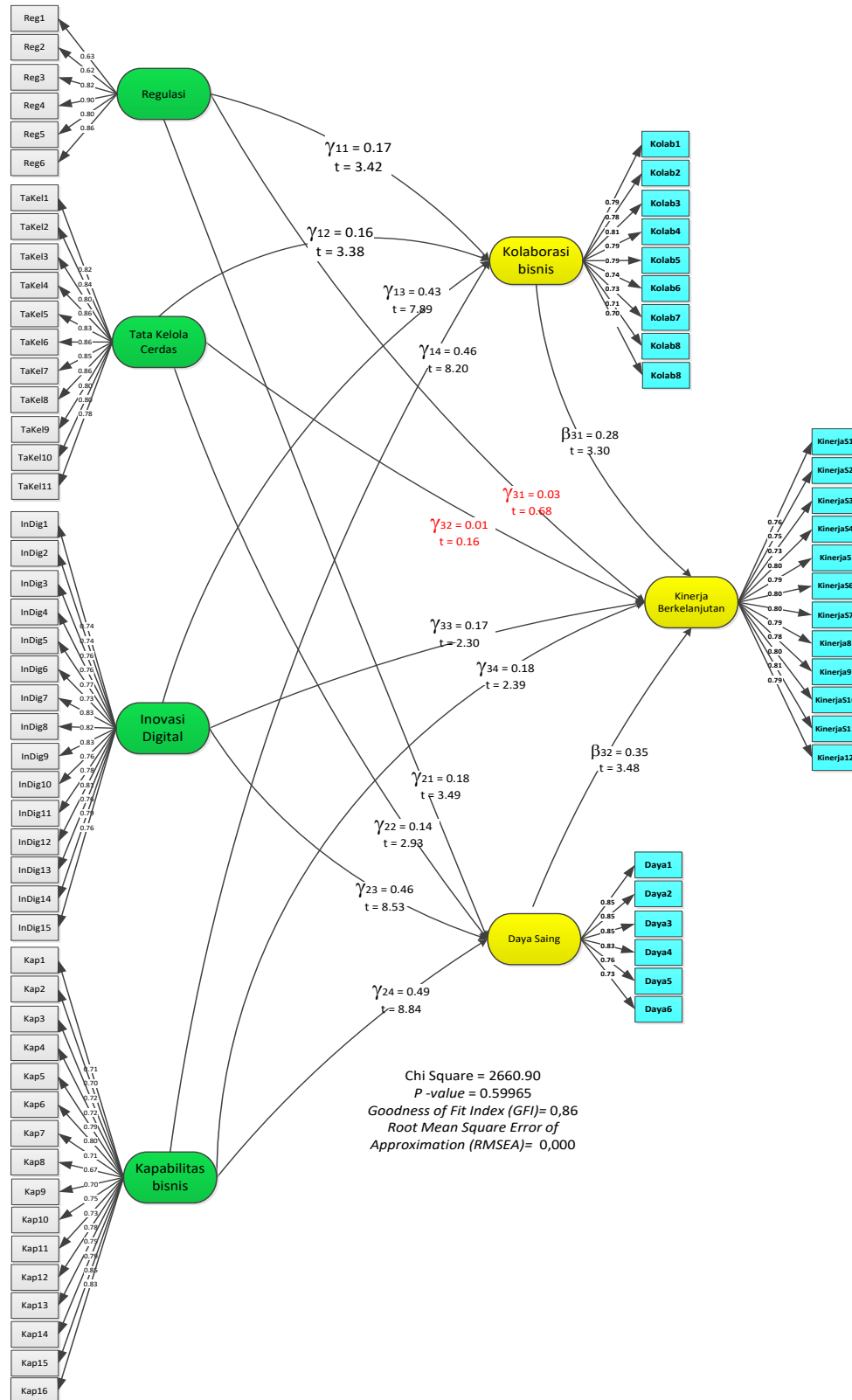
Fig. 2: Model test results. (Source: results of data processing with LISREL 8.7)

3.2. The Effect of Government Regulation, Smart Governance, Digital Innovation, and Business Capabilities on Microenterprise Business Collaboration, Competitiveness, Sustainable Performance

The first hypothesis examines the effect of government regulation, smart governance, digital innovation, and business capabilities on microenterprise business collaboration in Belitung. The results of

hypothesis testing are shown in the following Table 2:

Table 2. H1-H2-H3 hypothesis test results

Hypothesis	Coefficient of Estimation	t count	R2	Prob.	Conclusion
H1a	0,17	3,42	0,029	0,001	Significant
H1b	0,16	3,38	0,026	0,001	Significant
H1c	0,43	7,89	0,185	0,000	Significant
H1d	0,46	8,2	0,212	0,000	Significant
H2a	0,18	3,49	0,032	0,001	Significant
H2b	0,14	2,93	0,020	0,004	Significant
H2c	0,46	8,53	0,212	0,000	Significant
H2d	0,49	8,84	0,240	0,000	Significant
H3a	0,03	0,68	0,001	0,497	insignificant
H3b	0,01	0,16	0,000	0,873	insignificant
H3c	0,17	2,3	0,029	0,022	Significant
H3d	0,18	2,39	0,032	0,018	Significant

Based on Table 2, it is known that government regulations, smart governance, digital innovation, and business capabilities have a significant influence on micro business collaboration in Belitung. The second hypothesis examines the effect of government regulation, smart governance, digital innovation, and business capabilities on the competitiveness of micro-enterprises in Belitung. Table 2 also shows that government regulations, smart governance, digital innovation, and business capabilities have a significant influence on the competitiveness of micro-enterprises in Belitung. Based on the R2 value, it is known that business capabilities have the most dominant significant influence with R2 of 0.240, followed by digital innovation (R2=0.212), government regulation (R2=0.032), and smart governance (R2=0.020). The test results show that internal strengths in micro enterprises, namely business capabilities and digital innovation, have a greater role than external factors, government regulations and smart governance in their efforts to build the competitiveness of micro businesses in Belitung. The role of business capabilities in building competitiveness has been proven in previous research (Qamariah & Muchtar, 2019).

3.3. The Effect of Business Collaboration and Competitiveness on the Sustainable Performance of Micro Enterprises in Belitung

The fourth hypothesis examines the effect of business collaboration and competitiveness on the sustainable performance of micro-enterprises in Belitung. The results of hypothesis testing are revealed in Table 3 below:

Table 3. H4-H5 hypothesis test results

Hypothesis	Coefficient of Estimation	t count	R2	Prob.	Conclusion
H4	0,28	3,3	0,078	0,001	Significant
H5	0,35	3,48	0,123	0,001	Significant

The results of hypothesis testing in Table 3 show that business collaboration has a significant effect on the sustainable performance of micro businesses in Belitung. Additionally, the fifth hypothesis examines the effect of competitiveness on the sustainable performance of micro-enterprises in Belitung. This shows that high quality standards for materials, products, and services are competitiveness factors that will have a significant impact on achieving sustainable performance. As for practice, the average business actor has prioritized the application of product material quality standards, followed by the application of product quality standards, but for service standards, the value is lower than the application of competitive prices. This is a homework for business actors to further improve the quality of service

that will provide a more memorable and competitive customer experience.

3.4. The Effect of Government Regulation, Smart Governance, Digital Innovation, and Business Capabilities on the Sustainable Performance of Micro Enterprises in Belitung through Business Collaboration and Competitiveness

The sixth hypothesis examines the effect of government regulation, smart governance, digital innovation, and business capabilities on the sustainable performance of micro-enterprises in Belitung through business collaboration. The results of hypothesis testing are revealed in Table 4 below:

Table 4. H6-H7 hypothesis test results

Hypothesis	Coefficient of Estimation	t count	R2	Prob.	Conclusion
H6a	0,0476	2,44**	0,048	0,015	Significant
H6b	0,0448	2,36**	0,045	0,019	Significant
H6c	0,1204	3,24**	0,120	0,001	Significant
H6d	0,1288	3,18**	0,129	0,002	Significant
H7a	0,063	2,51**	0,063	0,013	Significant
H7b	0,049	2,19**	0,049	0,030	Significant
H7c	0,161	3,27**	0,161	0,001	Significant
H7d	0,172	3,22**	0,172	0,001	Significant

The test results in Table 4 show that the four variables, namely government regulation, smart governance, digital innovation, and business capabilities, are able to affect the sustainable performance of micro businesses in Belitung because of their influence on business collaboration. In the meantime, the seventh hypothesis examines the effect of government regulation, smart governance, digital innovation, and business capabilities on the sustainable performance of micro-enterprises in Belitung through competitiveness.

The test results in Table 4 show that the four variables, namely government regulation, smart governance, digital innovation, and business capabilities, are able to affect the sustainable performance of micro businesses in Belitung because of their influence on competitiveness.

Business capability is the variable that contributes the most to efforts to build the competitiveness of micro-enterprises that have an impact on sustainable performance, followed by digital innovation, government regulations, and smart governance. This indicates the importance of developing business capabilities to increase competitiveness which will have an impact on sustainable performance.

3.5. Research Findings

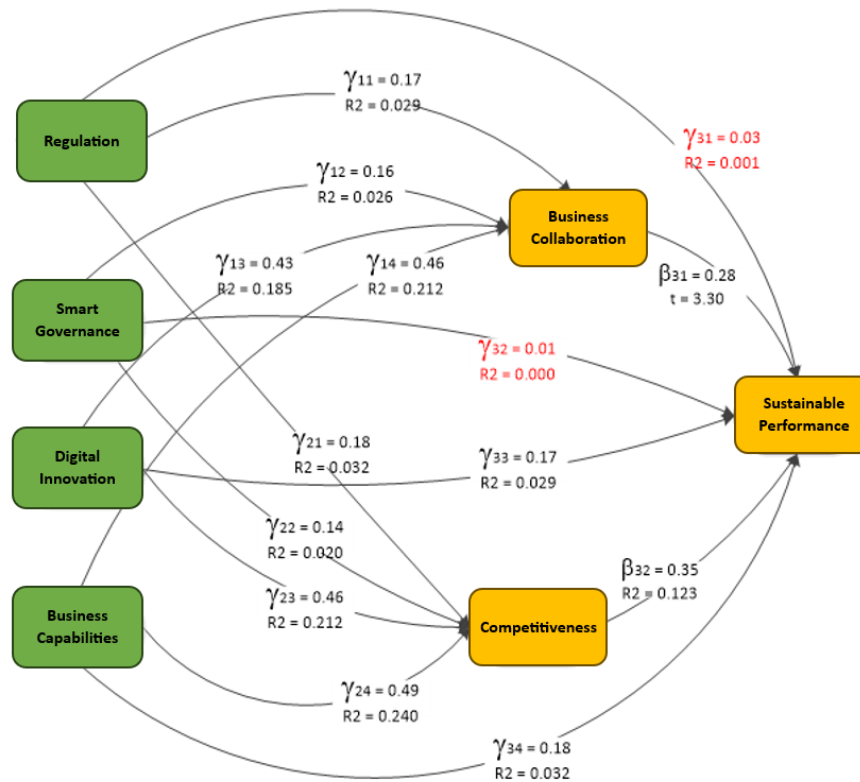Based on hypothesis testing, the following research findings were obtained:

Fig. 3: Research findings model. (Source: results of data processing with LISREL 8.7)

Based on testing all hypotheses, it was found that the competitiveness variable has a more dominant direct influence on the sustainable performance of micro-enterprises in Belitung, followed by business collaboration, business capability, and digital innovation. Meanwhile, government regulations and smart governance do not have a direct influence on sustainable performance. Indirectly, business capabilities have a greater influence than digital innovation, government regulations, and smart governance, in influencing the sustainable performance of micro-enterprises, both through business collaboration and through competitiveness. As for the four exogenous variables, it turns out that business capabilities have a greater influence than digital innovation, government regulations, and smart governance in building business collaboration and micro-business competitiveness.

Based on this, improving the sustainable performance of micro-enterprises in Belitung relies on competitiveness and business collaboration that is built by business capabilities and digital innovation development, and is supported by government regulations and smart governance.

3.6. Discussion

This study found that government regulations, smart governance, digital innovation, and business capabilities collectively contribute to the cultivation of micro business collaboration in Belitung (Rudenko et al., 2016; Shan et al., 2021; Chen et al., 2021). Notably, the development of business capabilities within Belitung's micro-enterprises is primarily driven by the ability to establish trust, while these enterprises prioritize the establishment of recognizable trademarks in the market (Widiati et al., 2021; Hidayat, 2022). In terms of digital innovation, the significant aspects involve acquiring information about new digital devices and understanding evolving digital behaviors (Kannan, 2017; Matarazzo et al., 2021). However, micro-entrepreneurs place a higher emphasis on crafting products that are functional and generate consumer engagement (Parthiban et al., 2021). Turning to government regulations, the ease of navigating administrative procedures for business initiation holds the most significant role for micro-enterprises (Gupta & Barua, 2016). Interestingly, business actors perceive that the government's contribution to the micro-enterprise sector also impacts the development of

business collaboration (Warner & Sullivan, 2017). Nevertheless, according to business actors, the most crucial supporting aspect in establishing collaborative business endeavors lies in the active involvement of the local government in the micro business sector's development (Adamowicz & Machla, 2016).

In the meantime, Government regulations, smart governance, digital innovation, and business capabilities collectively contribute to bolstering the competitiveness of micro businesses in Belitung (Hijran & Oktariani, 2021). Notably, business capabilities emerge as the paramount factor, exerting a more substantial influence than digital innovation, government regulations, and smart governance in enhancing micro business competitiveness within the Belitung context (Wardhani & Agustina, 2015). A pivotal dimension of business capability that underpins competitiveness is the aptitude for trust-building, although micro-entrepreneurs in Belitung underscore their efforts towards cultivating well-recognized trademarks in the market (Sebhatu et al., 2017). Shifting the focus to digital innovation, the primary role in enhancing competitiveness lies in accumulating information about novel digital devices and emerging digital behaviors (Eze et al., 2020). However, micro-business actors prioritize the creation of products with tangible utility that fosters consumer engagement (Wang et al., 2020). Meanwhile, in terms of government regulations, the pivotal role in nurturing competitiveness lies in streamlining administrative procedures for business establishment (Martins & Veiga, 2022). Interestingly, the perspective of business actors suggests that the government's involvement plays a significant role in cultivating resilience and stamina among micro-entrepreneurs (Warner & Sullivan, 2017). Nonetheless, the viewpoint of business actors underscores that active participation from the local government in the micro-business sector's development is the cornerstone supporting element in fortifying the competitive stance of micro businesses (Adamowicz & Machla, 2016).

Government regulations and smart governance, in the context of Belitung's micro businesses, do not exhibit a direct role in the construction of sustainable performance (Ilyas et al., 2020). In contrast, both digital innovation and business capabilities distinctly contribute to the enhancement of sustainable performance within this milieu (Ullah et al., 2023). Notably, among these factors, business capabilities assert a more pronounced influence over sustainable performance compared to digital innovation (Wielgos et al., 2021). Within the scope of Belitung's micro businesses, the facet of business capability that assumes paramount significance is the capacity to foster trust (Van Kleef & Roome, 2007). Shifting the focus to digital innovation, the pivotal role in nurturing sustainable performance revolves around the accumulation of insights regarding novel digital devices and emerging digital behaviors (Nadkarni, & Prügl, 2021). Intriguingly, micro-entrepreneurs place a stronger emphasis on crafting utilitarian products that foster consumer engagement (Parthiban et al., 2021).

In the pursuit of sustainable performance for micro-enterprises in Belitung, business collaboration emerges as a vital factor (Larsson & Larsson, 2020). Leading this domain is the customer loyalty program, which notably bolsters sustainable performance, followed by the meticulous selection of dependable suppliers, fostering two-way communication with customers, fostering communication amongst employees, nurturing supplier relationships, enhancing internal collaboration, engaging with competitors, and collaborating with governmental entities (Brenner, 2005; Martínez-Peláez et al., 2023; Sørensen & Torfing, 2011). However, in practical terms, micro-entrepreneurs in Belitung prioritize the implementation of employee communication, indicating that although the customer loyalty program holds potential, its actual implementation doesn't match the prominence of employee communication. This discrepancy underscores that while the micro-businesses understand the significance of customer partnerships, particularly through loyalty programs, the optimal development of this aspect remains unrealized, despite its potential to exert the most substantial impact on sustainable performance.

Competitiveness emerges as a pivotal factor facilitating the attainment of sustainable micro business performance in Belitung (Adamik & Sikora-Fernandez, 2021). Among the array of competitiveness factors, it is high quality standards for materials, products, and services that assume the paramount role in driving sustainable performance (Le & Ikram, 2022). Additional dimensions of competitiveness contributing to sustainable performance encompass after-sales service quality,

competitively priced products vis-à-vis similar competitors, and pricing in alignment with the delivered product/service quality (Gattorna, 2017). Government regulations, smart governance, digital innovation, and business capabilities collectively offer avenues for bolstering sustainable performance within Belitung's micro-enterprises through the lens of business collaboration (Helen Samujh , 2011; Räisänen & Tuovinen, 2020). Primarily, it is business capabilities that wield the most substantial influence, spearheading endeavors to foster impactful business collaborations that resonate with sustainable performance (Muna et al., 2022). This underlines the crucial imperative of nurturing and enhancing business capabilities to fortify the bargaining power necessary for cultivating strategic partnerships that, in turn, significantly affect sustainable performance. Moreover, the quartet of government regulations, smart governance, digital innovation, and business capabilities collectively contribute to advancing sustainable performance within Belitung's micro-enterprises through the lens of competitiveness. Chief among these, business capabilities wield the most substantial sway, spearheading the establishment of micro-business competitiveness with far-reaching implications for sustainable performance. Subsequent in significance are the roles played by digital innovation, government regulations, and smart governance. This underscores the critical necessity of cultivating and amplifying business capabilities to heighten competitiveness, ultimately echoing in the enhancement of sustainable performance.

4. Conclusion

Utilizing a SEM analysis, this study sought to understand which factors significantly influence the sustainability of SMEs in Belitung island, Indonesia. After conducting thorough hypothesis testing, the results revealed that among the variables studied, the competitiveness factor holds the most prominent and direct sway over the sustainable performance of micro-enterprises situated in Belitung. This is closely followed by business collaboration, business capability, and digital innovation. Conversely, there is no immediate direct impact noted from government regulations and smart governance on sustainable performance. However, an indirect effect is observed, wherein business capabilities exhibit a more substantial influence compared to digital innovation, government regulations, and smart governance in shaping the sustainable performance of micro-enterprises. This influence is channeled both through business collaboration and competitiveness. In terms of the four external variables, it becomes evident that business capabilities wield a more substantial influence than digital innovation, government regulations, and smart governance in fostering business collaboration and enhancing the competitive edge of micro-businesses. These findings underscore the importance of fostering competitiveness and nurturing business collaboration, which in turn are cultivated through the development of business capabilities and digital innovation. This trajectory is further reinforced by supportive measures such as government regulations and smart governance, ultimately contributing to the enhancement of sustainable performance among micro-enterprises in Belitung. The broader implications of these findings are substantial. They suggest a paradigm shift in how we approach the sustainability of SMEs in unique geographical contexts like Belitung Island. By pinpointing the critical factors of competitiveness and collaboration, and recognizing the supportive roles of digital innovation and smart governance, this research provides a roadmap for policymakers, business leaders, and stakeholders. It underscores the importance of focusing on intrinsic business strengths and collaborative efforts, rather than relying solely on external regulatory frameworks for sustainable growth. This approach not only fosters a more resilient and competitive SME sector but also aligns with the overarching goal of sustainable development in ecologically sensitive regions like Belitung. Ultimately, this study's conclusions offer valuable insights for developing strategies that balance economic growth with environmental and social sustainability, a balance that is increasingly crucial in our rapidly evolving global landscape.

Acknowledgements

References

Adamik, A., & Sikora-Fernandez, D. (2021). Smart organizations as a source of competitiveness and sustainable development in the age of industry 4.0: Integration of micro and macro perspective. *Energies*, *14*(6), 1572.

Adamowicz, M., & Machla, A. (2016). Small and medium enterprises and the support policy of local government. *Oeconomia Copernicana*, *7*(3), 405-437.

Agyabeng-Mensah, Y., & Tang, L. (2021). The relationship among green human capital, green logistics practices, green competitiveness, social performance and financial performance. *Journal of Manufacturing Technology Management*, *32*(7), 1377-1398.

Astawa, I. K., Pirzada, K., Budarma, I. K., Widhari, C. I. S., & Suardani, A. A. P. (2021). The effect of green supply chain management practices on the competitive advantages and organizational performance. *Polish Journal of Management Studies*, *24*(1).

Brenner, A. (2005). Collaborative Insight: Fostering Communication between Designers and Their Clients.

Chen, C. L., Lin, Y. C., Chen, W. H., Chao, C. F., & Pandia, H. (2021). Role of government to enhance digital transformation in small service business. *Sustainability*, *13*(3), 1028.

Choi, Y. S., & Lim, U. (2017). Contextual factors affecting the innovation performance of manufacturing SMEs in Korea: A structural equation modeling approach. *Sustainability*, *9*(7), 1193.

Creswell, J. W. (2014). *Research Design Qualitative, Quantitative, and Mix Methods Approach* (4th ed.,). Thousand Oaks, CA: SAGE Publication.

Eze, S. C., Chinedu-Eze, V. C., Okike, C. K., & Bello, A. O. (2020). Critical factors influencing the adoption of digital marketing devices by service-oriented micro-businesses in Nigeria: A thematic analysis approach. *Humanities and Social Sciences Communications*, *7*(1), 1-14.

Gattorna, J. (Ed.). (2017). *Strategic supply chain alignment: best practice in supply chain management*. Routledge.

Graafland, J., & Bovenberg, L. (2020). Government regulation, business leaders' motivations and environmental performance of SMEs. *Journal of Environmental Planning and Management*, *63*(8), 1335-1355.

Gupta, H., & Barua, M. K. (2016). Identifying enablers of technological innovation for Indian MSMEs using best–worst multi criteria decision making method. *Technological Forecasting and Social Change*, *107*, 69-79.

Hawkins, D. S. (2022). Global Youth Engagement in Promoting Community Empowerment in Indonesian Geoparks Development: Prospects and Challenges for Indonesia Geopark Youth Forum. *Journal of Social Development Studies*, *3*(1), 29-40.

Helen Samujh, R. (2011). Micro-businesses need support: Survival precedes sustainability. *Corporate Governance: The international journal of business in society*, *11*(1), 15-28.

Hengky, S. H. (2022). Evolving sustainability Ciletuh's Global Geopark. *Business and Economic Research*, *12*(3), 1-21.

Hidayat, W. (2022). COLLABORATIVE GOVERNANCE DALAM PENGEMBANGAN DIGITALISASI UMKM PADA ERA REVOLUSI INDUSTRI 4.0 DI WILAYAH BANGKA BELITUNG. *TheJournalish: Social and Government*, *3*(3), 247-254.

Hijran, M., & Oktariani, D. (2021). Peran Provinsi Kepulauan Bangka Belitung Dalam Pengembangan Sistem Ekonomi Kerakyatan Saat Pandemi Covid-19 Menurut Undang-Undang 1945. *Jurnal Profit: Kajian Pendidikan Ekonomi Dan Ilmu Ekonomi,[SL]*, *8*(2), 95-101.

Ilyas, S., Hu, Z., & Wiwattanakornwong, K. (2020). Unleashing the role of top management and government support in green supply chain management and sustainable development goals. *Environmental Science and Pollution Research*, *27*, 8210-8223.

Kannan, P. K. (2017). Digital marketing: A framework, review and research agenda. *International journal of research in marketing*, *34*(1), 22-45.

Kraft, C., Lindeque, J. P., & Peter, M. K. (2022). The digital transformation of Swiss small and medium-sized enterprises: insights from digital tool adoption. *Journal of Strategy and Management*, *15*(3), 468-494.

Larsson, J., & Larsson, L. (2020). Integration, application and importance of collaboration in sustainable project management. *Sustainability*, *12*(2), 585.

Le, T. T., & Ikram, M. (2022). Do sustainability innovation and firm competitiveness help improve firm performance? Evidence from the SME sector in vietnam. *Sustainable Production and Consumption*, *29*, 588-599.

Le, T. T., Vo, X. V., & Venkatesh, V. G. (2022). Role of green innovation and supply chain management in driving sustainable corporate performance. *Journal of Cleaner Production*, *374*, 133875.

Luo, M., Al Shami, S. A. H., & Mansor, N. B. (2019). The development of SMEs in China: Opportunities and Challenges. *Opción: Revista de Ciencias Humanas y Sociales*, (20), 912-936.

Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., ... & Mena, L. J. (2023). Role of digital transformation for achieving sustainability: mediated role of stakeholders, key capabilities, and technology. *Sustainability*, *15*(14), 11221.

Martins, J., & Veiga, L. G. (2022). Digital government as a business facilitator. *Information Economics and Policy*, *60*, 100990.

Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, *123*, 642-656.

Muna, N., Yasa, N., Ekawati, N., & Wibawa, I. (2022). A dynamic capability theory perspective: borderless media breakthrough to enhance SMEs performance. *International Journal of Data and Network Science*, *6*(2), 363-374.

Muthu, S. S. (Ed.). (2023). *Novel Sustainable Raw Material Alternatives for the Textiles and Fashion Industry*. Springer Nature.

Nadkarni, S., & Prügl, R. (2021). Digital transformation: a review, synthesis and opportunities for future research. *Management Review Quarterly*, *71*, 233-341.

Naradda Gamage, S. K., Ekanayake, E. M. S., Abeyrathne, G. A. K. N. J., Prasanna, R. P. I. R., Jayasundara, J. M. S. B., & Rajapakshe, P. S. K. (2020). A review of global challenges and survival strategies of small and medium enterprises (SMEs). *Economies*, *8*(4), 79.

Onu, P., & Mbohwa, C. (2021). Industry 4.0 opportunities in manufacturing SMEs: Sustainability outlook. *Materials Today: Proceedings*, *44*, 1925-1930.

Parthiban, R., Qureshi, I., Bandyopadhyay, S., & Jaikumar, S. (2021). Digitally mediated value creation for non-commodity base of the pyramid producers. *International Journal of Information Management*, *56*, 102256.

Prasanna, R. P. I. R., Jayasundara, J. M. S. B., Naradda Gamage, S. K., Ekanayake, E. M. S., Rajapakshe, P. S. K., & Abeyrathne, G. A. K. N. J. (2019). Sustainability of SMEs in the competition: A systemic review on technological challenges and SME performance. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(4), 100.

Qamariah, I., & Muchtar, Y. C. (2019). Analyzing business performance of small and medium enterprises (SMEs) based on human capital, social capital and competitive advantage. *Ecoforum Journal*, *8*(2).

Räisänen, J., & Tuovinen, T. (2020). Digital innovations in rural micro-enterprises. *Journal of rural studies*, *73*, 56-67.

Refly, S., & Esti, M. (2020). Optimization of the Implementation of Village Government in Indonesia. *Вестник Российского университета дружбы народов. Серия: Государственное и муниципальное управление*, *7*(4), 352-360.

Rehman, S. U., Bresciani, S., Yahiaoui, D., & Giacosa, E. (2022). Environmental sustainability orientation and corporate social responsibility influence on environmental performance of small and medium enterprises: The mediating effect of green capability. *Corporate Social Responsibility and Environmental Management*, *29*(6), 1954-1967.

Rodríguez-Espíndola, O., Cuevas-Romo, A., Chowdhury, S., Díaz-Acevedo, N., Albores, P., Despoudi, S., ... & Dey, P. (2022). The role of circular economy principles and sustainable-oriented innovation to enhance social, economic and environmental performance: Evidence from Mexican SMEs. *International Journal of Production Economics*, *248*, 108495.

Rudenko, L. G., Zaitseva, N. A., Mekush, G. E., Dmitrieva, N. V., & Vasilieva, L. S. (2016). Improving private sector and government partnership system to support small businesses in the service sector. *International Electronic Journal of Mathematics Education*, *11*(5), 1261-1270.

Sebhatu, S. P., Enquist, B., & Edvardsson, B. (Eds.). (2021). *Business transformation for a sustainable future*. Routledge.

Shan, S., Duan, X., Zhang, Y., Zhang, T. T., & Li, H. (2021). Research on collaborative governance of smart government based on blockchain technology: an evolutionary approach. *Discrete Dynamics in Nature and Society*, *2021*, 1-23.

Sørensen, E., & Torfing, J. (2011). Enhancing collaborative innovation in the public sector. *Administration & society*, *43*(8), 842-868.

Supriatna, J., & Margules, C. (2022). *The National Parks of Indonesia*. Yayasan Pustaka Obor Indonesia.

Ullah, M. R., Tahir, S. H., Shahzadi, H., & Kamran, H. W. (2023). Digital Pathways to Success: The Transformative Power of Digitalization and Digital Capabilities on SMEs' Financial Performance. *iRASD Journal of Economics*, *5*(2), 465-485.

Van Kleef, J. A., & Roome, N. J. (2007). Developing capabilities and competence for sustainable business management as innovation: a research agenda. *Journal of cleaner production*, *15*(1), 38-51.

Wang, Y., Shen, S., Sotiriadis, M., & Zhang, L. (2020). Suggesting a framework for performance evaluation of tourist attractions: A balance score approach. *Sustainability*, *12*(15), 6220.

Wardhani, R. S., & Agustina, Y. (2015). Analisis faktor-faktor yang memengaruhi daya saing pada sentra industri makanan khas bangka di kota pangkalpinang. *Jurnal Akuntansi Universitas Jember*, *10*(2), 64-96.

Warner, M., & Sullivan, R. (Eds.). (2017). *Putting partnerships to work: Strategic alliances for development between government, the private sector and civil society*. Routledge.

Widiati, E., Levyda, L., & Ratnasari, K. (2021). Optimalisasi Media Sosial Instagram Dalam Aktivitas Bisnis Bagi Umkm Di Bangka Belitung. *Jurnal Industri Kreatif dan Kewirausahaan*, *4*(2).

Wielgos, D. M., Homburg, C., & Kuehnl, C. (2021). Digital business capability: its impact on firm and customer performance. *Journal of the Academy of Marketing Science*, *49*(4), 762-789.