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Leveraging Green Dynamic Capabilities in Developing Green Marketing Strategies to Explain Green Competitive Advantage

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ABSTRACT

This study examines how green dynamic capabilities (GDC) interact with green marketing strategies (GMS) to influence green competitive advantage (GCA) in Indonesia's tourism and hospitality industry. Grounded in the resource-based view (RBV) and dynamic capabilities theory, this research explores how firms can leverage internal resources to achieve sustainable competitive advantages. The study employs a quantitative design using multi-source, three-wave time-lagged data collected from 322 respondents in the tourism and hospitality sector. Structural equation modeling with SmartPLS 3.2.8 was applied to test both direct and indirect relationships among the key constructs while controlling for potential common method bias through multi-wave data collection and marker variable analysis. The results indicate that green dynamic capabilities significantly and positively affect green competitive advantage, both directly and indirectly, through green marketing strategies. The findings highlight that integrating GDC with GMS enables firms to enhance sustainability performance, market reputation, and long-term competitiveness. The study offers insights for practitioners and policymakers on how to strengthen corporate sustainability performance through the development of adaptive environmental capabilities and strategic green marketing initiatives in the rapidly evolving tourism industry. This research contributes to the literature by empirically validating an integrated model linking green dynamic capabilities, green marketing strategies, and green competitive advantage within an emerging market context, providing both theoretical and managerial implications for achieving sustainable business excellence.

Keywords: green dynamic capabilities, green marketing strategies, green competitive advantage, tourism, hospitality

ABSTRAK

Penelitian ini bertujuan untuk menganalisis bagaimana green dynamic capabilities (GDC) berinteraksi dengan green marketing strategies (GMS) dalam memengaruhi green competitive advantage (GCA) pada industri pariwisata dan perhotelan di Indonesia. Dengan berlandaskan teori resource-based view (RBV) dan dynamic capabilities theory, penelitian ini mengeksplorasi bagaimana perusahaan dapat memanfaatkan sumber daya internal untuk mencapai keunggulan kompetitif berkelanjutan. Penelitian ini menggunakan pendekatan kuantitatif dengan pengumpulan data multi-source dan three-wave time-lagged dari 322 responden di sektor pariwisata dan perhotelan. Analisis dilakukan menggunakan Structural Equation Modeling (SEM) melalui

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perangkat lunak SmartPLS 3.2.8 untuk menguji hubungan langsung dan tidak langsung antarvariabel, serta mengendalikan potensi common method bias melalui desain pengumpulan data bertahap dan penggunaan variabel penanda. Temuan menunjukkan bahwa green dynamic capabilities berpengaruh positif dan signifikan terhadap green competitive advantage, baik secara langsung maupun tidak langsung melalui mediasi green marketing strategies. Integrasi antara GDC dan GMS terbukti mampu meningkatkan kinerja keberlanjutan, reputasi pasar, serta daya saing jangka panjang perusahaan. Penelitian ini memberikan wawasan bagi praktisi dan pembuat kebijakan mengenai pentingnya pengembangan kemampuan adaptif dan strategi pemasaran hijau yang efektif untuk memperkuat kinerja keberlanjutan di industri pariwisata yang dinamis. Penelitian ini memberikan kontribusi empiris dengan memvalidasi model integratif yang mengaitkan GDC, GMS, dan GCA dalam konteks pasar negara berkembang, serta menawarkan implikasi teoretis dan manajerial untuk mewujudkan keunggulan bisnis berkelanjutan.

Kata Kunci: *green dynamic capabilities, green marketing strategies, green competitive advantage, pariwisata, perhotelan*

INTRODUCTION

Green competitive advantage refers to a company's ability to gain strategic benefits through the implementation of ethical and environmentally friendly business practices (Azhar Ud, et al, 2024). This advantage is primarily reflected in higher operational efficiency achieved through energy conservation, waste reduction, and the sustainable use of resources. In the tourism and hospitality industry, adopting green strategies has become essential to remain competitive in an increasingly environmentally conscious market (Tanveer et al., 2024). By improving energy efficiency and optimizing raw material use, companies not only reduce operational costs but also minimize their environmental impact and strengthen their image as socially responsible and sustainability-oriented entities.

Companies that consistently adopt environmentally responsible practices tend to attract consumers who are concerned about sustainability issues. This consumer preference for green products and services contributes to increased market share and customer loyalty (Ali et al., 2023). Moreover, proactive compliance with environmental regulations helps companies avoid legal risks and penalties while enhancing their reputation as socially and environmentally responsible organizations. Therefore, green competitive advantage not only provides financial benefits but also reinforces long-term corporate reputation and supports global sustainability objectives.

Previous studies have shown that green dynamic capabilities are very important for companies in facing environmental challenges while maintaining their competitive position (Mubeen et al., 2024). Green dynamic capabilities have been analyzed in various contexts, including manufacturing (Amaranti et al., 2019), service innovation (Lin and Chen, 2017), green innovation (Yousaf, 2021; Singh et al., 2022), process innovation (Ahmad et al., 2022), and creativity (Joshi and Dhar, 2020). However, the understanding of how green capabilities affect other performance components, especially green organizational performance, is still limited. Furthermore, the processes explaining how green capabilities contribute to sustainability performance and green competitive advantage have not been extensively explored and are largely speculative (Li et al., 2024). Several studies have investigated the role of green marketing strategy as a mediator in the relationship between green capabilities and Green Competitive Advantage, as well as examining the combined impact of green capabilities and green marketing strategy on GCA, particularly in emerging markets, where companies face unique sustainability pressures (Nassani et al., 2022).

Recent studies by academics suggest the need for further exploration on how companies can systematically achieve Green Competitive Advantage (Ali et al., 2023). One of the proposed approaches is the utilization of Green dynamic capabilities, which enables companies to adapt and develop the ability to respond to ever-evolving

environmental challenges. According to (Nguyen et al., 2023), Green dynamic capabilities play an important role in strengthening a company's ability to innovate and integrate sustainability practices into their operations, thereby not only maintaining a Green Competitive Advantage but also meeting the increasing demands for sustainability. Moreover, it is important for companies to align their organizational strategies with clear environmental goals. This alignment ensures that the company's strategic decisions, both in terms of internal policies and marketing, support broader sustainability goals. By combining green dynamic capabilities and a green marketing strategy that aligns with environmental principles, companies can create sustainable long-term value, reduce risks, and enhance their image in the eyes of increasingly environmentally conscious consumers. Therefore, further research in this field is expected to provide a deeper understanding of the mechanisms that can be adopted by companies to achieve and maintain Green Competitive Advantage (Qiu et al., 2020).

Based on the discussion that has been explained, the emerging research question is how Green dynamic capabilities and green marketing strategy, and the interaction of both, influence the achievement of Green Competitive Advantage in the tourism and hospitality industry. To answer this question, this research refers to the natural resource-based view theory introduced by (Hart, 1995), with the aim of building an integrated model. This research will empirically examine how companies can develop Green dynamic capabilities by reconfiguring their internal resources and capabilities to create and maintain Green Competitive Advantage. Green dynamic capabilities that enable companies to adapt to environmental changes and challenges will be studied in the context of how companies formulate effective green marketing strategies. The interaction between green dynamic capabilities and green marketing strategy is expected to have a significant impact on the level of Green Competitive Advantage, with companies that have the ability to innovate in sustainable practices and capitalize on market opportunities focused on sustainability being more competitive in the market. This research is expected to provide a deeper understanding of how these elements interact with each other and contribute to the company's success in achieving Green Competitive Advantage.

Theoretical study and hypothesis

The Natural Resource-Based View (NRBV) theory provides a strong foundation for the conceptual framework in this research, as illustrated in Figure 1. NRBV expands the traditional Resource-Based View (RBV) theory developed by (Barney, 1991) by adding an environmental sustainability dimension to corporate strategic management (Hart, 1995). While the RBV theory focuses on creating Green Competitive Advantage through valuable resources, the NRBV adapts these principles by incorporating resources related to environmental sustainability as key to obtaining and maintaining Green Competitive Advantage (Reza Salehzadeh et al., 2024). This theory states that companies that develop unique sustainable resources and capabilities, such as environmentally friendly processes, green innovations, and internal strategies that support sustainability, can differentiate themselves from competitors and achieve long-term competitive advantages. (Amna Farrukh et al., 2021) NRBV emphasizes the importance of not only having green resources but also the ability to manage and optimize these resources through deep capabilities in facing dynamic environmental challenges. (Fadi Alkaraan et al., 2024) the NRBV theory encompasses two main perspectives: first, established conditions, which focus on how companies acquire and maintain competitive advantage by leveraging existing green resources; second, dynamic capabilities, which describe a company's ability to adapt and develop its resources and capabilities in accordance with rapid changes and developments in the external environment. These dynamic capabilities encompass the company's ability to change, adapt, and innovate in the face of ever-evolving environmental challenges. In this context, companies with green dynamic capabilities will be able to respond more quickly to market pressures and regulations focused on sustainability. This research adopts the concept of green capabilities and evolving environmentally friendly strategies from previous literature (Ali et al., 2023) to develop a framework that links green dynamic capabilities with green competitive advantage. In

this perspective, green marketing strategies play an important role in supporting the implementation and development of green capabilities. while green dynamic capabilities enable companies to continuously adapt and develop sustainable innovations that strengthen their competitive advantage. Overall, the NRBV theory provides a deep understanding of how companies can develop and utilize green resources and capabilities to create and maintain competitive advantage in an increasingly environmentally sustainable context.

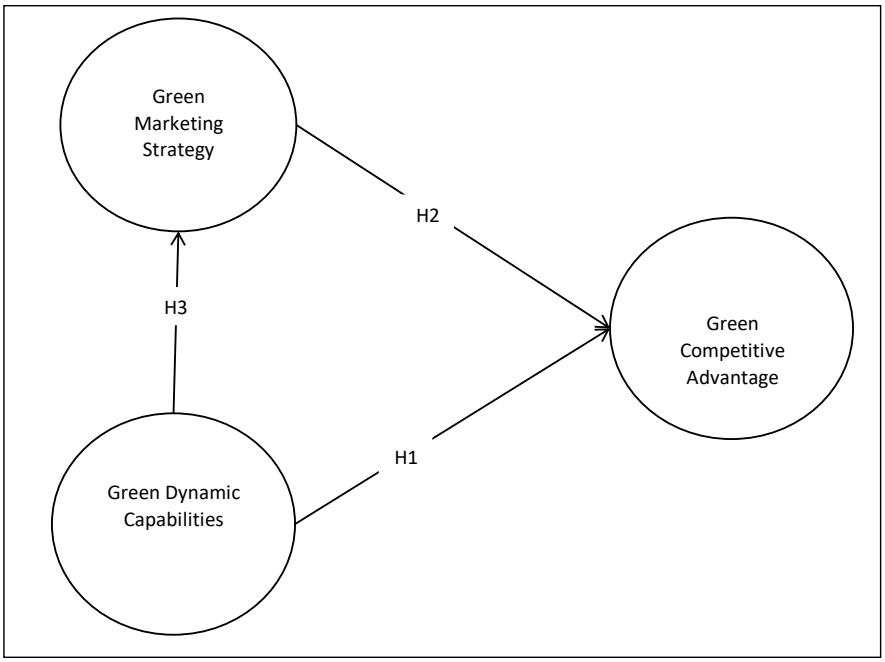

Figure 1. Theoretical research model

Based on the Natural Resource-Based View (NRBV) theory, this research argues that green dynamic capabilities, such as the ability to adapt and innovate in the face of environmental challenges, play a key role in enhancing the effectiveness of companies in managing environmental resources sustainably (Chen and Chang, 2013). These dynamic capabilities enable companies to respond to regulatory changes and consumer preferences that increasingly demand environmentally friendly practices. Additionally, green marketing strategies play a role in differentiating the company from its competitors and attracting consumers who are increasingly aware of environmental issues, which in turn enhances the company's market share and brand image (Arej Alhemimah et al., 2024). Green marketing strategies not only create value for the company but also contribute to the formation of customer loyalty that cares about sustainability. On the other hand, the green organizational culture implemented within the company promotes sustainability values and creates an environment that supports sustainable innovation (Ali et al., 2023). This culture serves as the foundation for the development of new environmentally friendly ideas and supports the organization's commitment to sustainable practices. Together, green dynamic capabilities, green marketing strategies, and a green organizational culture form unique resources that strengthen the company's environmentally friendly competitive advantage. This competitive advantage ultimately enhances the company's performance and ensures alignment with the increasing market demand for sustainability.

Green Dynamic Capabilities and Green Competitive Advantage

Green dynamic capabilities refer to a company's ability to develop, adapt, and leverage their capabilities in facing environmental sustainability challenges and green initiatives. This term is described as targeted dynamic capabilities, which enable organizations to modify their products and processes to meet the demands of environmental conditions and adapt to dynamic environmental changes (Amaranti et al., 2019). In this context, green dynamic capabilities not only encompass the ability to innovate in creating

environmentally friendly technologies but also include the capacity to reduce negative environmental impacts, such as carbon emissions, and improve energy efficiency across the company's operations. By having green dynamic capabilities, companies are able to adapt to the continuously evolving environmental regulations and policies, as well as enhance their competitiveness in a market that is increasingly focused on sustainability (J Abbas, 2024). This capability also supports companies in responding quickly to market trends and consumer preferences that increasingly demand more environmentally friendly products and services. Overall, green dynamic capabilities are key for companies that want to maintain relevance and competitive advantage in a market that increasingly considers sustainability factors (Koentjoro and Gunawan, 2020). By integrating these capabilities, companies can achieve their sustainability goals and support the implementation of more effective environmentally friendly practices. Therefore, hypothesis 1 is: ***H_1 Green capabilities positively influence green competitive advantage.***

Green Marketing Strategy and Green Competitive Advantage

Green marketing strategy refers to a series of marketing practices that highlight the attributes of products, services, or brands that focus on sustainability and social responsibility towards the environment. This strategy aims to attract consumers who are increasingly aware of environmental and sustainability issues, who prefer products or services that are not only of high quality but also environmentally friendly. Green marketing includes communicating sustainability values such as the use of environmentally friendly raw materials, carbon footprint reduction, energy efficiency, and the use of production processes with minimal environmental impact. By emphasizing these attributes, companies can build emotional connections with consumers who support sustainability and social justice goals. (Nguyen et al, 2023) emphasize that green marketing not only creates product differentiation in an increasingly competitive market but also encourages customer loyalty among those who care about sustainability. (Suttikun and Mahasuweerachai, 2023) show that green marketing strategies can be an effective tool for enhancing the brand image and reputation of a company as an environmentally responsible entity, which in turn positively impacts the company's long-term performance.

The importance of green marketing for organizations has been emphasized by (Kotler et al., 2021), which highlights its strategic role in attracting consumers who are concerned about environmental issues. Although the literature supports the conceptual relationship between green dynamic capabilities and green marketing strategies, this relationship is more than just theoretical. Green dynamic capabilities enable organizations to adapt and innovate according to sustainability demands, while green marketing strategies facilitate the communication of environmentally friendly values to consumers (Horng et al., 2022). These two elements complement each other, strengthening the company's position in an increasingly competitive and sustainability-focused market. (Liu and Dong, 2021) found that the implementation of strategic approaches in green marketing positively affects green competitive advantage. If implemented effectively, green marketing strategies can enhance a company's reputation by demonstrating a commitment to sustainability and social responsibility (Papadas et al., 2019). This encourages customer loyalty among those concerned with environmental issues, while also expanding the company's market share. Thus, green marketing not only creates product differentiation but also strengthens the company's competitive position in an increasingly sustainability-focused market, providing long-term benefits and creating value for the organization. Therefore, this study proposes hypothesis 2 as follows. ***H_2 Green marketing strategies have a positive impact on green competitive advantage.***

Green Dynamic Capabilities and Green Marketing Strategy

This research argues about the indirect influence of green dynamic capabilities on green competitive advantage (Hayes, 2022). through green marketing strategies, green dynamic capabilities enable companies to adapt to environmental changes and seize sustainability opportunities, while green marketing strategies serve to market the company's environmental values to consumers. The conditional mediation model (Arain et al., 2022)

is used in this study to explain the structural relationships among the subject constructs in achieving green competitive advantage. This model shows that the indirect influence between green dynamic capabilities and green competitive advantage through green marketing strategies can vary. Based on this, the hypothesis is proposed that green organizational culture plays a significant moderating role in influencing the relationship between green dynamic capabilities, green marketing strategies, and green competitive advantage. Therefore, this study proposes the following hypothesis 3. ***H_3 Green marketing strategy mediates the relationship between green dynamic capabilities and green competitive advantage***

METHOD

The quantitative approach is used in this study to examine the relationship between green dynamic capabilities and green marketing strategies on green competitive advantage. This approach is very effective in identifying patterns, relationships, and significant differences in the data, which can provide a clearer understanding of the variables involved (Nisar et al., 2021). By using deductive reasoning, this research tests the proposed hypothesis regarding how green dynamic capabilities and green marketing strategies contribute to achieving green competitive advantage.The quantitative approach also allows researchers to measure these variables objectively, providing results that are more measurable and statistically testable. This approach has been widely applied in research in the hospitality and tourism sector, particularly those focusing on sustainability (Umrani et al., 2022). As shown in previous research, a quantitative approach is also relevant in assessing how companies in this industry implement sustainability practices and how these practices impact their performance and competitiveness (Algarni et al., 2022). This approach provides strong empirical evidence that supports the development of effective green strategies in the context of the hospitality and tourism sector.

Table 1: operational definition of research variables

Variable	Indikator	Skala Likert
Green Dynamic Capabilities (Sarwar et al., 2023)	Adaptation to Change Environmental Regulation Ability to Manage Natural Resources Sustainably Sustainable Environmental Management Process The Ability to Innovate in Green Production Processes	(1-5) STS- 1, CS-2, N-3,S-4, SS-5
Green Marketing Strategies (Horng et al., 2022)	The Use of Eco-Friendly Labels Product Differentiation Based on Sustainability Consumer Involvement in Green Practices Environmental Education and Socialization Campaign	(1-5) STS- 1, CS-2, N-3,S-4, SS-5
Green Competitive Advantage (Arej Alhemimah et al., 2024)	Market Share for Green Products Consumer Loyalty towards Eco-Friendly Products Reduction of Environment-Based Operational Costs Brand Reputation as an Environmentally Friendly Company Compliance with Environmental Standards and Regulations	(1-5) STS- 1, CS-2, N-3,S-4, SS-5

Measurement

By using a managed structured survey questionnaire, the research team was able to collect data from companies in the tourism and hospitality sector. The research team randomly contacted managers at various companies in the hospitality and tourism sector using LinkedIn to facilitate reaching out to their subordinates for feedback. To minimize common method bias and improve temporal validity, the data were collected in three separate waves over a six-month period. The first wave (March–April 2023) measured green dynamic capabilities, the second wave (May–June 2023) captured green marketing strategies, and the third wave (July–August 2023) measured green competitive advantage. After obtaining confirmation from each manager, the research team contacted subordinate employees to request their feedback. As a result, the research team was able to gather a consensus of 322 individuals to participate in this study. The following respondent data can be seen in Table 2.

Table 2: Demographic Characteristics Tourism industry respondents

Category	Item	Staff	%	Manager UP	%
Gender	Male	88	27%	102	32%
	Female	102	32%	30	9%
Age (Years)	20-30	70	22%	52	16%
	31-40	31	10%	59	18%
	41-50	16	5%	56	17%
	> 50	16	5%	22	7%
Tenure (Years)	0-5	77	24%	12	4%
	5-10	86	27%	38	12%
	10-20	52	16%	35	11%
	> 20	14	4%	8	2%

Common method bias (CMB)

To address the issue of common method variance (CMV) that can affect the validity of research results, several methods were applied in this study. First, data were collected through sampling a number of respondents consisting of managers and employees, with data collection conducted at three different time intervals. This approach aims to reduce the possibility of bias that may occur if data is only collected at one time. Second, the questions in the questionnaire are placed randomly for each construct to reduce the potential correlation between questions that could affect the respondents' results. Third, the privacy and confidentiality of participants are strictly maintained to ensure that they feel safe and comfortable in providing honest information. (Miller and Simmering, 2023) marker variables that are not related to the main construct of the study are included in the analysis to identify the potential presence of CMV. These marker variables serve as a control to test whether the collected data is not influenced by method bias. The results of the correlation analysis presented in Table 3 show that there is no significant correlation between the marker variable and the main constructs of the study, which proves that the CMV issue can be avoided and the validity of the research results is maintained.

Data Analysis

In this study, we used a combination of path analysis and regression to analyze the data, as the proposed model involves direct, indirect, and interaction effects between the variables under investigation. Considering the complexity of the relationships between variables in the model, this approach was chosen as the most appropriate to provide a clearer picture of the influence between the existing constructs. We used SmartPLS v3.2.8, in the SmartPLS v3.2.8 program there are several tests that support the testing of construct variables to test the formulated hypotheses. This technique allows researchers to test more complex relationships and provide more accurate results. This macro has also been widely applied in research in the field of hospitality and tourism, as seen in previous studies (Hameed et al., 2023). By using SmartPLS v3.2.8, this research can integrate both analysis techniques, namely path and regression, to identify and measure direct, indirect, and interaction effects between variables in a more effective and efficient manner.

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed in this study due to its strong suitability for prediction-oriented research models and its ability to handle complex structural relationships. The primary objective of this research is not only to test theoretical relationships but also to predict green competitive advantage based on green dynamic capabilities and green marketing strategies, which aligns well with the predictive orientation of PLS-SEM. Moreover, the proposed research framework includes a second-order (hierarchical) construct, namely green marketing strategies, which is efficiently modeled and estimated using the PLS-SEM approach.

In addition, PLS-SEM does not require the assumption of multivariate normal data distribution, making it particularly appropriate for survey-based research in emerging market contexts where data often deviate from normality. This methodological flexibility enhances the robustness of the analysis and ensures reliable parameter estimation. Furthermore, the research model is structurally complex, incorporating both direct and indirect (mediating) effects among multiple latent constructs. PLS-SEM is widely recognized as a superior analytical technique for simultaneously estimating such mediation effects while maintaining statistical power, especially with complex models and reflective measurement structures. Therefore, the use of PLS-SEM in this study is methodologically justified and consistent with best practices in sustainability and hospitality research.

RESULT

The psychometric properties of the measurement model are evaluated through validity and reliability analysis. Each first-order construct undergoes a thorough assessment for validity and reliability. This assessment includes a thorough examination of the reliability of individual items, internal consistency reliability, and convergent and discriminant validity. A strong understanding of the validity and reliability of the measurement model can be achieved through the study of these various elements.

Descriptive Statistics and Correlations for Study Variables

Table 3: Results of Validation Measurement model

Indicator Green Dynamic Capabilities	Coefficients	AVE	Mean	STDEV
1.1 This company has the ability to quickly monitor the environment to identify green opportunities.	0,846		4.183	0.800
1.2 The company has effective routines to identify and develop new green knowledge.	0,832		3.801	0.954
1.3 Considering environmental aspects in pricing policies.	0,676		4.093	0.767
1.4 The company has the ability to successfully allocate resources to develop innovations	0,688		4.016	0.794
1.5 The company Using environmental considerations in product design	0,815		4.087	0.873
1.6 The company has the ability to assimilate, learn, produce, combine, share, transform, and apply new green knowledge	0,704		3.960	0.749
1.7 The use of recycled or reusable materials in products	0,769		4.065	0.873
1.8 The company has the ability to successfully coordinate employees to develop green technology	0,814		4.016	0.890
1.9 The company has the ability to develop technology	0,784		4.121	0.820
1.10 Conducting market research to detect eco-friendly products	0,753		4.177	0.798
1.11 Using green arguments in advertising and promotion	0,750		3.795	0.920
Indicator Green Marketing Strategies	**Coefficients**		**Mean**	**STDEV**
2.1 The use of eco-friendly labels on products influences consumer decisions in choosing more environmentally friendly products	0,874		4.096	0.760
2.2 Consumers tend to choose products differentiated by the sustainability commitment and environmentally friendly practices implemented by the company	0,698		3.991	0.786
2.3 Consumers are more likely to support brands that invite them to participate in environmentally friendly initiatives.	0,767		4.140	0.820
2.4 Consumers are more likely to purchase products from companies that are active in educating consumers about the importance of sustainability and environmental management.	0,839		3.966	0.745
2.5 Consumers are interested in participating in or supporting educational and socialization campaigns that focus on sustainability and environmental protection.	0,752		4.059	0.870
Indicator Green Competitive Advantage	**Coefficients**		**Mean**	**STDEV**
3.1 The company has a competitive advantage in terms of low costs in environmental management or green innovation compared to its main competitors	0,789		4.009	0.886
3.2 This company is more capable in environmental R&D and eco-friendly innovation than its main competitors	0,818		4.096	0.776
3.3 Your company is making efforts to reduce energy (such as electricity, fuel) to lower operational costs	0,859		4.084	0.757
3.4 The company's image related to sustainability and social responsibility is well recorded among customers.	0,848		4.081	0.739
3.5 Product sustainability is the main reason consumers continue to purchase products from a certain brand.	0,834		4.102	0.844
3.6 This company is more capable in environmental management compared to its main competitors.	0,800		4.121	0.719

All measurements in this study used a 5-point Likert scale. To measure green dynamic capabilities, we used 11 items adapted from (Umrani et al., 2022). For green marketing strategy, we used 5 items created and validated by (Liu and Dong, 2021). This construct is operationalized as a second-order high-level construct, consisting of two first-order variables with a total of 16 items. Finally, to capture green competitive advantage, we used 6 items adapted from (Suttikun, 2023). Table 3 presents the arrangement of questions used in this

research questionnaire. In addition, the questionnaire also includes demographic questions to gather information about the participants.

The measurement results show that each indicator item of Green Dynamic Capabilities, Green Marketing Strategies, and Green Competitive Advantage has a factor loading value above 0.6, indicating good validity and demonstrating that the questionnaire statements are reliable. Additionally, the average value of each measurement indicator is above 3.70, indicating that respondents understand and grasp each question posed well. This supports the conclusion that these indicators effectively measure the concepts that underpin Green Competitive Advantage in this study.

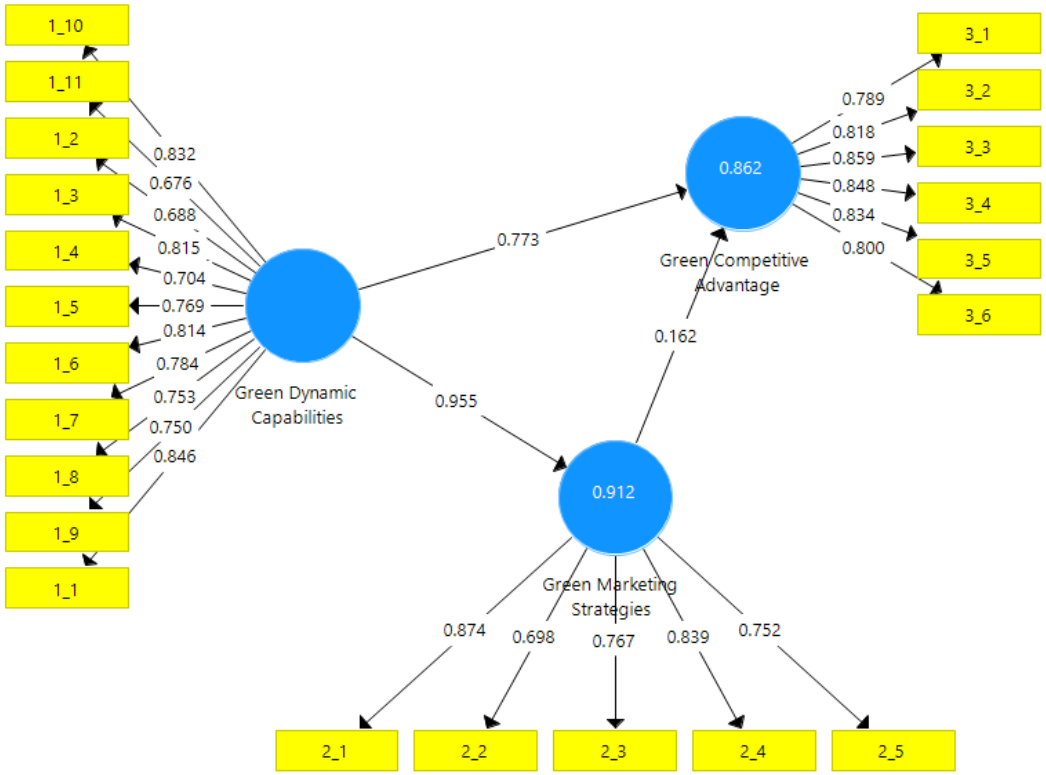

Figure 1: Measurement model

The results of the structural analysis of the path model coefficients indicate that in this study there are no simultaneity issues or common method bias. No endogeneity was found, which is the simultaneous influence between independent and dependent variables that can disrupt the valid relationship between variables. Endogeneity can cause biased and inaccurate results, making them unreliable. Therefore, these findings prove that Green Dynamic Capability, Green Marketing Strategy, and Green Competitive Advantage do not simultaneously influence each other, allowing the relationship between these variables to be analyzed validly.

Based on the factor loading correlation values of all the variables and indicators used in this study, it was found that these values are above 0.6. This indicates that the indicators used have a strong relationship with the measured construct. A factor loading value higher than 0.6 indicates that these indicators are effective in explaining the variance of the intended construct, with a higher level of reliability. Thus, the results of this analysis indicate that the measurement model used in this study is valid and reliable.

Table 4: Construct Reliability and Validity

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
Green Competitive Advantage	0,906	0,907	0,927	0,681
Green Dynamic Capabilities	0,930	0,935	0,940	0,591
Green Marketing Strategies	0,846	0,853	0,891	0,622

Discriminant Validity- Fornell-Larcker Criterion

Variable	Green Competitive Advantage	Green Dynamic Capabilities	Green Marketing Strategies
Green Competitive Advantage	0,924		
Green Dynamic Capabilities	0,727 (0,702)	0,968	
Green Marketing Strategies	0,899 (0,810)	0,955 (0.834)	0,988

Discriminant validity in this study is confirmed using two main methods, namely the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio (Henseler, 2021). Based on the Fornell-Larcker criterion, discriminant validity is assessed by examining the square root of the Average Variance Extracted (AVE) value for each construct. The AVE values recorded above the diagonal of the table indicate that the square root of the AVE for each construct exceeds the absolute value of the highest correlation with other constructs, which are located below the shaded diagonal in Table 4. This indicates that each construct is able to distinguish itself well from other constructs. Next, to ensure discriminant validity, the HTMT ratio is used. All HTMT values located above the shaded diagonal in Table 4 are below the critical threshold of 0.85, indicating no discrimination issues between the tested constructs. This ensures that the constructs involved in this research model can be clearly distinguished from one another, which supports the overall reliability and validity of the model used in this study.

Overall model predictability

Table 5: R-square (R(2)) and predictive relevance (Q(2)) of the endogenous variable

Variabel endogen	*R 2 Value*	Threshold	*Q 2 Value*	Threshold
Basic model				
Green Marketing Strategy	0,912		0,542	
Green Competitive Advantage	0,861	≥0,25 (weak)	0,528	
		≥0,50 (moderate)		>0
Interaction effects model		≥0,75 (substansial)		
Green Marketing Strategy	0,863		0,493	
Green Competitive Advantage	0,912		0,371	

The structural model is explained using the guidelines proposed by (Hoyle, 2023). To validate the structural model, multicollinearity, R(2), Q2 (predictive relevance), as well as thresholds and significance levels are determined. First, multicollinearity in the structural relationships is not very concerning because the variance inflation factor (VIF) is not too high, as seen in Table 4. On the other hand, in terms of in-sample prediction accuracy of the structural prediction model, R(2) ranges between 0.86 and 0.91 for green strategy and green competitiveness, indicating the predictability that can be found in the model. Additionally, the R(2) value is determined by the Q2 value of the model's predictive relevance, which corresponds to situations outside the sample. These results were obtained using the blindfolding technique. Table 5 shows that the Q2 values (green competitive advantage = 0.52, green marketing strategy = 0.54) are more significant than the model fit.

Hypothesis testing

Inner model provides the creation of bootstrap confidence intervals (CI), including percentiles, bias correction, bias correction, and acceleration metrics. These CI are crucial for measuring not only the total impact but also specific indirect paths, providing a comprehensive and diverse understanding of the complex relationships in our model. When the interval for any effect does not include zero, it implies that the effect is significantly different from zero (statistically significant), with a 95% confidence level. In

the bootstrap output, important information, such as the significance level of the beta coefficient, t-value, and p-value, can be easily generated.

The evaluation of the relationship between green dynamic capabilities and green competitive advantage in this study shows a significant indirect effect. Through mediation model analysis, it was found that the influence of green dynamic capabilities on green competitive advantage occurs not only directly but also through channels mediated by other factors, such as green marketing strategies or green organizational culture.

Table 6: Specific Indirect Effects

Mean, STDEV, T-Values, P-Values

Composite	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Green Dynamic Capabilities -> Green Marketing Strategies -> Green Competitive Advantage	0,155	0,151	0,071	2,170	0,030

Confidence Intervals

Composite	Original Sample (O)	Sample Mean (M)	2.5%	97.5%
Green Dynamic Capabilities -> Green Marketing Strategies -> Green Competitive Advantage	0,155	0,151	0,028	0,303

Confidence Intervals Bias Corrected

Composite	Original Sample (O)	Sample Mean (M)	Bias	2.5%	97.5%
Green Dynamic Capabilities -> Green Marketing Strategies -> Green Competitive Advantage	0,155	0,151	-0,004	0,040	0,331

The analysis results show a significant statistical significance value (n = p = 0.30; t = 2.17; CI 95% [0.30, 0.33]), which supports the understanding that green dynamic capabilities play an important role in creating and maintaining green competitive advantage, both directly and indirectly. These findings provide strong evidence for organizations to pay more attention to green dynamic capabilities in their efforts to achieve sustainable competitive advantage in an industry that is increasingly focused on environmental sustainability.

Final Results

Variable	Path Coefficients	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Keterangan
Green Dynamic Capabilities -> Green Competitive Advantage	0,772	0,074	10,435	0,000	Diterima
Green Dynamic Capabilities -> Green Marketing Strategies	0,955	0,005	190,428	0,000	Diterima
Green Marketing Strategies -> Green Competitive Advantage	0,161	0,074	2,180	0,030	Diterima

DISCUSSION

Green dynamic capabilities positively affects green competitive advantage

The test results show that the influence of Green Dynamic Capabilities on Green Competitive Advantage is statistically significant. The t-statistic value of 10.435 indicates a strong relationship between the two variables, and the P-value of 0.000, which is much smaller than the significance threshold of 0.05, confirms that the hypothesis is accepted. This indicates that Green Dynamic Capabilities, which encompass the company's ability to adapt, innovate, and utilize resources more efficiently in facing environmental challenges, play a crucial role in achieving green competitive advantage (Sarwar, 2023). This capability creates additional value for the company by introducing environmentally friendly solutions that not only meet regulatory demands (Salunke, 2019) but also provide an advantage over competitors who do not adopt similar strategies. Thus, companies that develop and manage Green Dynamic Capabilities well can gain a competitive advantage

in an industry that increasingly emphasizes sustainability and environmental responsibility (Nassani, 2022). according to (Hunt, 2020) who also supports this finding, emphasizes the importance of sustainable innovation and efficient natural resource management in supporting the competitive advantage of companies in an increasingly sustainability-oriented market.

Green marketing strategies have a positive impact on green competitive advantage.

The test results show that Green Marketing Strategy has a significant influence on Green Competitive Advantage. The t-statistic value of 2.18 with a P-value of 0.000, which is far below the significance threshold of 0.05, confirms that the relationship between these two variables is not coincidental and is statistically significant, thereby confirming that the hypothesis is accepted. This very low P-value indicates that the influence of Green Marketing Strategy on Green Competitive Advantage is real and strong. Green marketing strategies, which involve promoting environmentally friendly products and emphasizing sustainability values (Bansal, 2005), are capable of enhancing a company's competitiveness in an increasingly environmentally conscious market (Qiu, 2020). Marketing that prioritizes sustainability and social responsibility can build a positive image for the company (Nisar, 2021), attract consumers who care about environmental issues, and enhance customer loyalty. In addition, this strategy can also expand market share and enhance brand reputation. These findings indicate that companies that effectively adopt green marketing strategies can achieve sustainable competitive advantages in the face of market demands increasingly requiring environmentally friendly products. Therefore, investing in green marketing strategies not only provides long-term benefits for companies but also strengthens their position in the sustainability-focused industry.

The indirect influence of green dynamic capabilities on green competitive advantage through green marketing strategies

The test results show that the influence of Green Dynamic Capabilities through Green Marketing Strategies on Green Competitive Advantage is statistically significant. The t-statistic value of 190.428 with a P-value of 0.000, which is far below the significance threshold of 0.05, indicates that the relationship between these two variables is significant and confirms that the hypothesis is accepted. The very high t-statistic value indicates that the relationship between Green Dynamic Capabilities and Green Marketing Strategies(Shahriari et al., 2023), which ultimately affects Green Competitive Advantage, is very strong and positive. These findings affirm that green dynamic capabilities (Nassani et al., 2022), which involve a company's ability to adapt and innovate in the face of environmental challenges, can influence the effectiveness of the green marketing strategies they implement. This green marketing strategy (Papadas, 2019), in turn, serves as an effective tool in building an environmentally friendly company image, attracting the attention of sustainability-conscious consumers, and creating a competitive advantage in the market. Thus, this research underscores the importance of integrating green dynamic capabilities with green marketing strategies to support sustainable green competitive advantage, which not only provides long-term benefits for the company but also contributes to overall environmental sustainability.

The findings of this study demonstrate that Green Dynamic Capabilities (GDC) have a positive and significant effect on Green Competitive Advantage (GCA), both directly and indirectly through Green Marketing Strategies (GMS). These results are largely consistent with and supportive of prior empirical studies emphasizing the strategic role of environmentally oriented dynamic capabilities in achieving sustainable competitive advantage. For instance, earlier studies by Qiu et al. (2020) and Lin and Chen (2017) confirm that firms capable of integrating adaptive green capabilities with continuous innovation are more likely to secure superior competitive positions. Similarly, Nassani et al. (2022) and Mubeen et al. (2024) report that green dynamic capabilities significantly enhance sustainability performance and competitive advantage through innovation-driven mechanisms.

Furthermore, the mediating role of green marketing strategies extends the existing literature, which has predominantly focused on direct relationships between green capabilities and firm performance. This finding aligns with Papadas et al. (2019) and Liu and Dong (2021), who argue that green marketing acts as a strategic conduit that translates internal green capabilities into market-recognizable value. However, the strength of the mediation effect observed in this study contrasts with some evidence from developed economies, where green marketing has been found to exert a weaker influence due to market saturation and heightened consumer skepticism toward sustainability claims. The stronger mediation effect identified here suggests that, in emerging markets, green marketing strategies continue to provide substantial differentiation and competitive leverage. This contrast highlights the importance of institutional context and market maturity in shaping the effectiveness of green strategies.

The pronounced impact of green dynamic capabilities and green marketing strategies on green competitive advantage can be better understood by considering Indonesia's position as an emerging market, particularly within the tourism and hospitality sector. Firms in this context face increasing global pressure to adopt sustainable tourism practices while simultaneously operating under constraints related to limited resources, uneven regulatory enforcement, and varying levels of managerial capability. Under such conditions, firms that develop strong green dynamic capabilities—such as the ability to adapt to environmental regulations, improve energy efficiency, and implement eco-innovations—are better positioned to differentiate themselves from competitors.

In addition, consumer awareness of environmental sustainability in Indonesia is growing but has not yet reached the level of maturity observed in developed economies. This creates a strategic window in which green marketing strategies remain highly effective for building corporate reputation, stakeholder trust, and brand legitimacy. Green marketing therefore functions not only as a communication tool but also as a mechanism of social and institutional legitimacy, enabling firms to signal compliance with evolving environmental norms and stakeholder expectations. Consequently, the integration of green dynamic capabilities with green marketing strategies becomes a critical pathway for firms to achieve green competitive advantage in the Indonesian context.

Overall, these findings reinforce the core argument of the Natural Resource-Based View (NRBV) that environmentally grounded competitive advantage is highly context-dependent rather than universally applicable. In emerging markets such as Indonesia, the synergistic alignment of internal green dynamic capabilities and externally oriented green marketing strategies represents an effective strategic approach to achieving sustainable competitive advantage. By doing so, this study addresses an important empirical gap in the sustainability literature, which has remained heavily concentrated on developed market contexts.

CONCLUSION

Research exploring the relationship between green dynamic capabilities and green marketing strategies, as well as their impact on green competitive advantage in the tourism and hospitality industry, provides deep insights into the complex dynamics of sustainability practices in this sector (Khan et al., 2023; Nguyen et al., 2023; Ullah et al., 2023). The research results indicate that green dynamic capabilities play a crucial role in creating sustainable green competitive advantages, as evidenced by empirical findings showing a positive and significant relationship (H_1). Green dynamic capabilities, which encompass a company's ability to adapt and respond to environmental changes, have proven to be a key factor in achieving a superior competitive position in the eco-friendly tourism market (Khan et al., 2019; Lin and Wu, 2014; Lin and Chen, 2017; Qiu et al., 2020; Salunke et al., 2019; Teece, 2023). This indicates that companies investing in the development of internal capabilities for sustainability can achieve a lasting advantage compared to competitors who do not have a similar focus.\

This research also emphasizes the importance of green marketing strategies in strengthening the relationship between green dynamic capabilities and green competitive

advantage, as evidenced by empirical findings that show a positive and significant relationship (H_2). These findings indicate that green marketing strategies act as mediators that facilitate the realization of benefits from the environmental capabilities possessed by the company. In this context, green marketing not only focuses on conveying an environmentally friendly message to consumers but also integrates sustainability elements into marketing strategies to enhance the company's image and attract consumers who are increasingly concerned about environmental issues (Liu and Dong, 2021; Chiappetta Jabbour, 2011; Joshi and Dhar, 2020). This underscores the importance of implementing effective green marketing strategies that can communicate the company's sustainability values to customers, thereby strengthening its competitive position in the market.

This research also identifies contextual factors that influence the relationship between green dynamic capabilities and green marketing strategies, evidenced by empirical findings showing a positive and significant relationship (H_3), which can either strengthen or weaken the strength of that relationship. External and internal factors such as environmental regulations, market trends, and company policies can play an important role in shaping the effectiveness of this relationship. These findings are consistent with previous research (Nassani et al., 2022; Shahriari et al., 2023; Papadas, 2019) which shows that companies that can adapt and leverage their green dynamic capabilities with appropriate green marketing strategies tend to have stronger and more sustainable competitive advantages. Therefore, companies in the tourism and hospitality industry must pay attention to these contextual aspects when designing and implementing their sustainability strategies, to ensure that they can fully leverage the potential of their green dynamic capabilities in achieving competitive advantage.

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