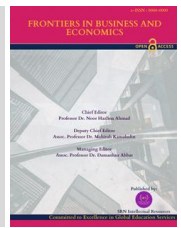




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Original Article

Green Marketing Effectiveness and Environmental Cost Integration: A Cross-Country Analysis of Consumer Purchasing Decisions in Indonesia and Malaysia

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Abstract: Growing environmental degradation and climate-related risks have intensified public awareness of sustainable consumption across Southeast Asia. Firms increasingly adopt green marketing strategies, yet empirical evidence of their effectiveness remains inconsistent across emerging markets. Prior studies often treat green marketing and environmental accounting separately, with limited integration. Cross-country comparative evidence is also scarce, particularly in explaining how market-specific factors shape consumer responses. This study examines the effectiveness of the green marketing mix and its integration with environmental accounting in influencing purchasing decisions in Indonesia and Malaysia. It employs a quantitative cross-sectional design using survey data from 610 respondents and applies Partial Least Squares Structural Equation Modeling with Multi-Group Analysis. The results show that in Indonesia, green price and green place significantly influence purchasing decisions, indicating that affordability and accessibility are key drivers of green consumption. Green product and green promotion are not significant, suggesting limited sensitivity to product attributes and promotional efforts. In Malaysia, none of the green marketing variables significantly affect purchasing decisions, although price shows a marginal effect. This indicates that other factors, such as brand trust or perceived value, may play a stronger role. The Multi-Group Analysis confirms significant differences between the two countries. The model shows higher explanatory power in Malaysia but stronger variable significance in Indonesia. These findings highlight the need to integrate environmental costs into pricing strategies and support marketing claims with transparent sustainability reporting. Context-specific strategies are essential to enhance the effectiveness of green marketing.

Keywords: Green Marketing Mix, Green Accounting, Purchasing Decisions, PLS-SEM Multi-Group Analysis, Sustainable Consumer Behavior.



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1. Introduction

Growing concerns over climate change, environmental degradation, and resource depletion have fundamentally reshaped consumer preferences and business strategies worldwide. Increasing public awareness of sustainability has encouraged consumers to evaluate products not only based on price and quality but also on their environmental attributes. Consequently, green marketing has emerged as an important strategic approach that enables firms to create value while responding to growing environmental expectations. Green marketing encompasses the development, pricing, distribution, and promotion of environmentally friendly products and services, with the objective of encouraging sustainable consumption while simultaneously strengthening organizational competitiveness (Cherian & Jacob, 2012; Boztepe, 2012; Rajput et al., 2022; Mansour et al., 2024). The effectiveness of green marketing is commonly explained through the green marketing mix, comprising Green Product, Green Price, Green Place, and Green Promotion. These four dimensions represent integrated managerial strategies that influence consumer evaluations throughout the purchasing process. Green products provide environmentally responsible alternatives, green pricing reflects consumers' willingness to pay for sustainable value, green place emphasizes product accessibility through environmentally responsible distribution channels, and green promotion communicates credible environmental information that shapes consumer trust and purchasing decisions. Previous studies consistently demonstrate that these dimensions positively influence green purchase intention and purchasing behavior, although the magnitude of their effects varies across countries, demographic groups, and market environments (Ansar, 2013; Boztepe, 2012; Hussain et al., 2020; Maniatis, 2016; Shehawy & Khan, 2024; Mansour et al., 2024).

Despite the increasing adoption of green marketing practices, converting consumers' positive environmental attitudes into actual purchasing decisions remains a persistent challenge. Numerous studies have documented the attitude-behavior gap, in which consumers express strong environmental concern but remain reluctant to purchase green products due to higher prices, limited product availability, insufficient product knowledge, or skepticism about firms' environmental claims. Environmental awareness, trust, perceived product value, and knowledge have therefore emerged as critical determinants that strengthen the effectiveness of green marketing strategies in encouraging sustainable purchasing behavior (Saragi, 2025; Jin et al., 2024; Hussain et al., 2020; Mehta & Chahal, 2021; Shehawy & Khan, 2024). Indonesia and Malaysia provide an appropriate setting for examining these relationships because both countries have experienced rapid economic growth while simultaneously promoting sustainability initiatives within the green economy framework. Although the two neighboring countries share several cultural, religious, and socioeconomic characteristics, they differ considerably in environmental regulations, sustainable development priorities, market maturity, consumer purchasing power, and the implementation of green business practices. These differences may influence consumers' responses to green marketing initiatives, making a comparative investigation particularly valuable for understanding whether marketing strategies that are effective in one country can be successfully implemented in another. Furthermore, comparative evidence from Southeast Asia remains relatively limited compared with studies conducted in China, Europe, and other developed markets (Surianshah, 2021; Saragi, 2025; Jin et al., 2024).

A cross-country comparison also contributes to marketing theory by examining whether the effects of Green Product, Green Price, Green Place, and Green Promotion differ across national contexts. Previous empirical findings indicate that environmental awareness, perceived quality, social influence, environmental values, and consumer knowledge affect purchasing decisions differently depending on market characteristics and cultural contexts (Ahnama & Rajabpour, 2017; Jin et al., 2024; Mehta & Chahal, 2021; Shehawy & Khan, 2024). However, relatively few studies have simultaneously compared the structural relationships among green marketing dimensions using respondents from Indonesia and Malaysia. Accordingly, this study employs Multi-Group Analysis (MGA) within the Partial Least Squares Structural Equation Modeling (PLS-SEM) framework to investigate whether significant differences exist between consumers in both countries. Beyond its contribution to marketing literature, this study is equally relevant from an accounting perspective. As organizations increasingly invest in environmentally responsible products and sustainable business practices, conventional accounting systems have become insufficient for capturing the full economic implications of environmental initiatives. Green Accounting, also known as Environmental Accounting, extends traditional accounting by identifying, measuring, recording, and reporting environmental costs and benefits associated with organizational activities. This approach enables firms to evaluate whether sustainability initiatives generate long-term economic value while reducing negative environmental impacts.

The integration of environmental costs into managerial decision-making is particularly important for implementing green marketing strategies. Decisions concerning environmentally friendly product development, sustainable

packaging, premium pricing, cleaner production processes, eco-efficient logistics, and environmentally responsible promotional campaigns all require substantial financial investments. Consequently, management accounting provides the analytical framework for measuring environmental costs, evaluating cost efficiency, and assessing whether green marketing initiatives create value for both organizations and consumers. Integrating environmental cost information into strategic marketing decisions also enhances corporate transparency and reduces the risk of greenwashing by supporting environmental claims with measurable operational performance (Mukonza & Swarts, 2020; Maziriri, 2020; Rajput et al., 2022; Mansour et al., 2024). Although previous studies have extensively investigated green marketing, green purchase intention, environmental awareness, and consumer behavior, limited empirical research has integrated green marketing effectiveness with environmental cost considerations within a cross-country comparative framework. Existing studies generally examine marketing variables independently or focus on single-country contexts, leaving insufficient understanding of how environmental cost integration complements green marketing strategies in influencing consumer purchasing decisions across different national environments (Cherian & Jacob, 2012; Hussain et al., 2020; Mukonza & Swarts, 2020; Shehawy & Khan, 2024).

Accordingly, this study examines the effects of Green Product, Green Price, Green Place, Green Promotion, and Environmental Cost Integration on consumer purchasing decisions among consumers in Indonesia and Malaysia. Environmental Cost Integration is incorporated to reflect consumers' perceptions that organizations genuinely invest in environmentally responsible production, distribution, and operational practices rather than relying solely on promotional claims. The inclusion of this construct broadens the conventional green marketing framework by connecting marketing strategy with accounting-based sustainability practices. Specifically, this research seeks to determine whether Green Product, Green Price, Green Place, Green Promotion, and Environmental Cost Integration significantly influence consumer purchasing decisions across countries. Furthermore, the study investigates whether the magnitudes of these relationships differ between Indonesia and Malaysia using Multi-Group Analysis in PLS-SEM. The findings are expected to provide robust empirical evidence regarding the effectiveness of green marketing and environmental cost integration in promoting sustainable consumer behavior while offering practical guidance for managers and policymakers seeking to strengthen sustainable consumption across Southeast Asia.

2. Materials and Methods

2.1. Research Design

This study adopts a quantitative, cross-sectional survey design (Sekaran & Bougie, 2016) to empirically examine the influence of the green marketing mix, comprising Green Product, Green Price, Green Place, and Green Promotion, together with Environmental Cost Integration, on consumer purchasing decisions in Indonesia and Malaysia. The theoretical framework integrates the traditional marketing management principles proposed by Kotler and Keller (2016) with the green marketing framework developed by Nekomahmud and Fekete-Farkas (2020). Furthermore, Environmental Cost Integration is incorporated to capture consumers' perceptions of firms' commitment to environmentally responsible business practices and sustainable resource management, thereby extending the conventional green marketing perspective.

2.2. Sampling and Data Collection

Primary data were collected using a structured questionnaire administered via purposive sampling. This approach ensured that all respondents had prior experience purchasing environmentally friendly products. The final sample comprised 610 respondents, including 577 from Indonesia and 33 from Malaysia. This unequal distribution reflects the exploratory nature of the comparative analysis in the Malaysian context while establishing Indonesia as the primary research setting. Before data collection, informed consent was obtained from all participants, and all responses were collected voluntarily. To ensure compliance with research ethics, participant anonymity and data confidentiality were strictly maintained throughout the study. All latent constructs were measured using a standardized five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

2.3. Data Analysis

The proposed hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) implemented in SmartPLS software (Ringle et al., 2015). Following the recommendations of Hair et al. (2019), the analysis employed a two-stage approach comprising measurement model evaluation and structural model assessment. The first stage evaluated the measurement (outer) model to establish the psychometric properties of the measurement instruments. Internal consistency reliability was assessed using Cronbach's alpha and Composite Reliability (CR). Convergent validity was evaluated through standardized factor loadings and Average Variance Extracted (AVE), while discriminant validity was assessed using both the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio.

2.4. Multi-Group Analysis

The second stage evaluated the structural (inner) model using a non-parametric bootstrapping procedure with 5,000 resamples to determine the significance of the hypothesized relationships based on standardized path coefficients, *t*-statistics, and *p*-values. To compare the structural relationships between Indonesian and Malaysian respondents, Partial Least Squares Multi-Group Analysis (PLS-MGA) was employed as recommended by Cheah et al. (2020). Given the substantial imbalance in sample sizes between Indonesia ($n = 577$) and Malaysia ($n = 33$), additional robustness procedures were implemented to strengthen the validity of the cross-country comparison. Specifically, the non-parametric Permutation Test and the Smith-Satterthwaite test were conducted to evaluate differences in path coefficients between the two groups. These procedures are appropriate for handling unequal sample sizes and provide more robust statistical inference for cross-group comparisons than conventional parametric methods (Chin & Dibbern, 2010).

3. Results

3.1. Assessment of Measurement Model

Table 1 presents the results of the measurement model assessment, including indicator reliability, internal consistency reliability, and convergent validity for all latent constructs. Following the recommendations of Hair et al. (2019), indicator reliability was assessed using outer loadings; internal consistency reliability was evaluated using Cronbach's alpha and Composite Reliability (CR); and convergent validity was examined using the Average Variance Extracted (AVE).

Table 1. Result of Construct Validity and Reliability

Construct	Item	Outer Loading	Cronbach Alpha	Composite Reliability	Average Variance Extracted
Green Product	PR1	0.858	0.858	0.861	0.610
	PR2	0.653			
	PR3	0.815			
	PR4	0.782			
Green Price	P1	0.57	0.821	0.825	0.546
	P2	0.772			
	P3	0.769			
	P4	0.819			
Green Place	PL1	0.649	0.714	0.715	0.500
	PL2	0.723			
	PL4	0.651			
Green Promotion	PM1	0.722	0.829	0.830	0.621
	PM2	0.817			
	PM3	0.821			
Consumer Purchasing Decision (Want to Buy)	K1	0.813	0.866	0.867	0.620
	K2	0.746			
	K3	0.822			
	K4	0.766			

For the Green Product construct, the outer loadings ranged from 0.653 to 0.858. The highest loading was observed for PR1 (0.858), followed by PR3 (0.815) and PR4 (0.782), whereas PR2 (0.653) exhibited the lowest loading but remained above the minimum acceptable threshold for exploratory research. The construct demonstrated excellent internal consistency, with a Cronbach's alpha of 0.858 and a Composite Reliability of 0.861, both exceeding the recommended threshold of 0.70. Furthermore, the AVE of 0.610 surpassed the recommended value of 0.50, indicating satisfactory convergent validity. These findings suggest that the Green Product construct adequately captures consumers' perceptions of environmentally friendly product characteristics. The Green Price construct exhibited outer loadings ranging from 0.570 to 0.819. Among its indicators, P4 (0.819) demonstrated the strongest contribution, followed by P2 (0.772) and P3 (0.769), while P1 (0.570) showed the weakest loading. Despite the relatively lower loading of P1, the construct achieved satisfactory reliability, with a Cronbach's alpha of 0.821 and a Composite Reliability of 0.825. Additionally, the AVE of 0.546 exceeded the recommended threshold, confirming acceptable convergent validity. These results indicate that the indicators collectively provide a reliable representation of consumers' perceptions regarding green pricing strategies.

For the Green Place construct, three indicators were retained after the measurement model evaluation. The outer loadings ranged between 0.649 and 0.723, with PL2 (0.723) contributing the strongest loading, followed by PL4 (0.651) and PL1 (0.649). The construct achieved a Cronbach's alpha of 0.714 and a Composite Reliability of 0.715, both exceeding the minimum acceptable level of 0.70, thereby indicating satisfactory internal consistency reliability. Moreover, the AVE reached 0.500, meeting the minimum criterion for convergent validity. Consequently, despite relatively moderate indicator loadings, the Green Place construct demonstrates acceptable psychometric properties and can be retained for subsequent structural model analysis.

The Green Promotion construct demonstrated strong psychometric performance. Its indicator loadings ranged from 0.722 to 0.821, with PM3 (0.821) recording the highest loading, closely followed by PM2 (0.817) and PM1 (0.722). Internal consistency reliability was supported by a Cronbach's alpha of 0.829 and a Composite Reliability of 0.830. The AVE value of 0.621 substantially exceeded the recommended threshold of 0.50, confirming strong convergent validity. These findings indicate that the Green Promotion construct consistently measures promotional activities associated with environmentally sustainable products. The dependent construct, Consumer Purchasing Decision (Want to Buy), also demonstrated satisfactory measurement properties. The indicator loadings ranged from 0.746 to 0.822, with K3 (0.822) exhibiting the highest loading, followed by K1 (0.813), K4 (0.766), and K2 (0.746). The construct achieved excellent internal consistency, reflected by a Cronbach's alpha of 0.866 and a Composite Reliability of 0.867. Furthermore, the AVE of 0.620 confirmed adequate convergent validity, indicating that the indicators explain more than 62% of the variance in the latent construct.

Thus, the measurement model demonstrates satisfactory reliability and convergent validity. All constructs achieved Cronbach's alpha and Composite Reliability values exceeding the recommended threshold of 0.70, while all AVE values met or exceeded the recommended threshold of 0.50. Although several indicators, including PR2 (0.653), P1 (0.570), PL1 (0.649), and PL4 (0.651), exhibited relatively lower outer loadings than the preferred benchmark of 0.70, they were retained because the corresponding constructs satisfied the recommended reliability and convergent validity criteria. According to Hair et al. (2019), indicators with loadings between 0.40 and 0.70 may be retained when their removal does not substantially improve Composite Reliability or Average Variance Extracted and when strong theoretical justification supports their inclusion. Therefore, the measurement model satisfies the necessary psychometric requirements and is appropriate for subsequent structural model evaluation and hypothesis testing.

3.2. Assessment of Structural Model

3.2.1 Coefficient of Determination (R^2)

Table 2 presents the coefficient of determination (R^2) for the endogenous construct, Consumer Purchasing Decision (Want to Buy), together with the results of the group comparison between Indonesia and Malaysia. The coefficient of determination (R^2) measures the proportion of variance in the dependent construct explained by the exogenous variables included in the structural model. According to Hair et al. (2019), R^2 values of approximately 0.25, 0.50, and 0.75 correspond to weak, moderate, and substantial explanatory power, respectively.

Table 2. Result of Coefficient Determination (R^2)

Variable	Original (Indonesia)	Original (Malaysia)	Original difference	Mean difference	2.50%	97.50%	p value
Want to Buy	0.353	0.792	-0.439	-0.16	-0.386	0.081	0.005

The results in Table 2 indicate that the structural model explains 35.3% of the variance in Consumer Purchasing Decision among Indonesian respondents ($R^2 = 0.353$). This finding suggests that the combined effects of Green Product, Green Price, Green Place, and Green Promotion provide moderate explanatory power for predicting consumers' purchasing decisions in Indonesia. The remaining 64.7% of the variance is attributable to other factors not included in the present model, such as environmental awareness, consumer trust, perceived value, environmental knowledge, social influence, or individual lifestyle characteristics. In contrast, the Malaysian sample produced an R^2 value of 0.792, indicating that approximately 79.2% of the variance in Consumer Purchasing Decision is explained by the green marketing constructs included in the model. Based on the guidelines proposed by Hair et al. (2019), this represents substantial explanatory power, suggesting that the selected predictors collectively account for a considerable proportion of consumers' purchasing decisions within the Malaysian sample.

A comparison of the two groups reveals a substantial difference in explanatory power. The observed R^2 difference of -0.439 indicates that the structural model explains consumer purchasing decisions more effectively in Malaysia than in Indonesia. The statistical comparison further supports this conclusion, with a p-value of 0.005, demonstrating that the difference in explanatory power between the two countries is statistically significant at the 5% significance level. The confidence interval for the difference ranges from -0.386 to 0.081, while the bootstrapped mean difference is

–0.160. Although the confidence interval indicates some variability in the estimated difference, the statistically significant p-value suggests that the model's predictive capability differs meaningfully across the two national contexts.

These findings, however, should be interpreted with caution. The Malaysian subsample consists of only 33 respondents, compared with 577 respondents from Indonesia. Small sample sizes can produce unstable estimates of the coefficient of determination and may inflate R^2 values due to sampling variability. Consequently, although the Malaysian model exhibits substantially higher explanatory power, this result should be regarded as preliminary and interpreted alongside the structural path analysis, where none of the individual relationships reached statistical significance. The apparent inconsistency between a high R^2 value and non-significant path coefficients is likely attributable to the limited statistical power associated with the relatively small Malaysian sample. Thus, the coefficient of determination analysis suggests that the proposed green marketing model possesses satisfactory predictive capability in both countries, with moderate explanatory power in Indonesia and substantial explanatory power in Malaysia. Nevertheless, additional empirical evidence based on a larger Malaysian sample is required to confirm the stability and generalizability of these findings.

3.3. Hypothesis Testing

Table 3 presents the results of the structural model assessment for Indonesia and Malaysia using Partial Least Squares Structural Equation Modeling (PLS-SEM). The significance of the hypothesized relationships was evaluated based on the standardized path coefficient (β), bootstrapped standard deviation (SD), t-value, and p-value obtained from 5,000 bootstrap resamples.

Table 3. Result of Hypothesis Testing (Indonesia and Malaysia)

Path Analysis	Indonesia					Malaysia				
	β	Mean	SD	t-value	p-value	β	Mean	SD	t-value	p-value
Green Place → Consumer Purchasing Decision	0.334	0.335	0.054	6.187	<0.001	0.377	0.362	0.344	1.096	0.273
Green Price → Consumer Purchasing Decision	0.342	0.345	0.055	6.252	<0.001	0.553	0.549	0.288	1.922	0.055
Green Product → Consumer Purchasing Decision	–0.072	–0.068	0.048	1.499	0.134	–0.002	0.049	0.239	0.008	0.994
Green Promotion → Consumer Purchasing Decision	0.059	0.058	0.054	1.088	0.276	0.004	–0.015	0.334	0.012	0.99

For the Indonesian sample, two of the four hypothesized relationships were statistically significant. Specifically, Green Place exhibited a positive and significant effect on Consumer Purchasing Decision ($\beta = 0.334$, $t = 6.187$, $p < 0.001$), indicating that greater accessibility, availability, and environmentally responsible distribution channels substantially encourage consumers to purchase green products. The relatively high t-value demonstrates that Green Place is one of the strongest determinants of purchasing decisions among Indonesian consumers. Similarly, Green Price exerted a positive and significant influence on Consumer Purchasing Decision ($\beta = 0.342$, $t = 6.252$, $p < 0.001$). This finding suggests that Indonesian consumers are willing to accept environmentally related price premiums when they perceive that green products provide additional environmental value and long-term benefits. Among all examined predictors, Green Price demonstrated the strongest standardized effect in the Indonesian sample, highlighting the importance of consumers' perceived value rather than price alone.

Conversely, Green Product did not significantly influence Consumer Purchasing Decision ($\beta = -0.072$, $t = 1.499$, $p = 0.134$). Although the relationship was negative, the coefficient was statistically insignificant, indicating that environmentally friendly product characteristics alone are insufficient to motivate purchasing decisions in the Indonesian market. Likewise, Green Promotion showed a positive but statistically insignificant relationship with Consumer Purchasing Decision ($\beta = 0.059$, $t = 1.088$, $p = 0.276$). This result suggests that promotional activities emphasizing environmental benefits do not, after accounting for other green marketing dimensions, independently influence consumers' purchasing decisions. For the Malaysian sample, none of the hypothesized relationships reached the conventional level of statistical significance ($p < 0.05$). Although Green Price produced the largest standardized coefficient ($\beta = 0.553$), the relationship remained statistically insignificant ($t = 1.922$, $p = 0.055$). This result is close to

the 5% significance threshold, suggesting that green pricing strategies may be practically important in the Malaysian market but warrant further investigation with a larger sample.

Similarly, Green Place demonstrated a positive relationship with Consumer Purchasing Decision ($\beta = 0.377$), but the effect was not statistically significant ($t = 1.096$, $p = 0.273$). This finding indicates that environmentally responsible distribution and product accessibility alone do not substantially influence Malaysian consumers' purchasing decisions within the present sample. The remaining relationships also failed to achieve statistical significance. Green Product exhibited an almost zero standardized coefficient ($\beta = -0.002$, $t = 0.008$, $p = 0.994$), indicating virtually no relationship with Consumer Purchasing Decision. Likewise, Green Promotion demonstrated a negligible positive effect ($\beta = 0.004$, $t = 0.012$, $p = 0.990$), suggesting that promotional communication emphasizing environmental responsibility does not significantly affect purchasing behavior among Malaysian respondents.

Thus, the findings reveal notable differences between the two countries. In Indonesia, consumers' purchasing decisions are primarily influenced by Green Price and Green Place, indicating that practical considerations such as reasonable green pricing and product accessibility play significant roles in encouraging sustainable purchasing behavior. In contrast, none of the green marketing dimensions demonstrated statistically significant effects in the Malaysian sample. This outcome should be interpreted cautiously because the Malaysian subsample comprised only 33 respondents, substantially fewer than the Indonesian sample (577 respondents). The limited sample size reduces statistical power and increases standard errors, making it more difficult to detect significant relationships despite relatively large, standardized coefficients. Consequently, the Malaysian results should be regarded as exploratory rather than conclusive and warrant validation in future studies employing a larger, more representative sample. Collectively, these findings suggest that the effectiveness of green marketing strategies is context-dependent and varies across national markets. While pricing and distribution strategies appear to be effective mechanisms for promoting green purchasing behavior in Indonesia, similar strategies may need to be adapted to better reflect Malaysian consumers' preferences, market conditions, and environmental awareness. These results further justify the subsequent Multi-Group Analysis (MGA), which examines whether the observed differences between Indonesia and Malaysia are statistically significant.

4. Discussion

This study examined the influence of the green marketing mix, comprising Green Product, Green Price, Green Place, and Green Promotion, on consumer purchasing decisions in Indonesia and Malaysia using Partial Least Squares Structural Equation Modeling (PLS-SEM) and Multi-Group Analysis (MGA). Overall, the findings demonstrate that the effectiveness of green marketing strategies differs across the two countries. While Green Price and Green Place significantly influenced Indonesian consumers' purchasing decisions, none of the proposed green marketing dimensions exhibited statistically significant effects in the Malaysian sample. These findings suggest that the influence of green marketing is highly context-dependent and shaped by differences in market conditions, consumer characteristics, and the maturity of sustainable consumption practices.

The first notable finding is the significant positive relationship between Green Place and consumer purchasing decisions in Indonesia. This result indicates that the availability, accessibility, and environmentally responsible distribution of green products are crucial for encouraging Indonesian consumers to purchase them. Consumers are more likely to purchase green products when these products are easily accessible through convenient retail channels and online platforms. This finding supports previous studies suggesting that product accessibility is a key determinant of green purchasing behavior, as consumers generally prefer sustainable products that require minimal additional effort to obtain (Boztepe, 2012; Maniatis, 2016; Mansour et al., 2024). The finding also reflects the rapid expansion of Indonesia's retail infrastructure and digital commerce, which has improved consumers' access to environmentally friendly products and strengthened sustainable consumption behavior (Saragi, 2025).

The analysis further revealed that Green Price exerted the strongest positive influence on consumer purchasing decisions in Indonesia. This finding suggests that Indonesian consumers are willing to accept premium prices when they perceive that green products deliver superior environmental value, product quality, and long-term benefits. Rather than focusing solely on lower prices, consumers appear to weigh whether the additional costs of environmentally friendly products are justified by their perceived benefits. This finding is consistent with the studies of Ansar (2013), Hussain et al. (2020), and Jin et al. (2024), which reported that green pricing positively influences purchase intention when consumers perceive value, trust, and environmental responsibility. Similarly, Saragi (2025) demonstrated that although price sensitivity remains an important consideration, environmental knowledge and consumer trust substantially strengthen consumers' willingness to purchase green products despite premium prices. These findings collectively suggest that firms should emphasize value-based pricing strategies rather than competing exclusively through price reductions.

In contrast, Green Product did not significantly influence consumer purchasing decisions in either Indonesia or Malaysia. Although environmentally friendly product attributes are generally expected to encourage sustainable purchasing, the present findings suggest that product characteristics alone are insufficient to motivate purchasing

behavior. One possible explanation is that environmentally friendly product features have become increasingly common in the marketplace and are therefore viewed as basic expectations rather than distinctive competitive advantages. Consequently, consumers may place greater emphasis on practical considerations such as affordability and accessibility when making purchasing decisions. This finding partially contradicts earlier studies that reported positive relationships between green product characteristics and consumer purchasing behavior (Boztepe, 2012; Jin et al., 2024). Nevertheless, it is consistent with research indicating that favorable evaluations of green products do not necessarily translate into actual purchasing behavior because of the persistent attitude-behavior gap (Mehta & Chahal, 2021; Shehawy & Khan, 2024).

Similarly, Green Promotion failed to demonstrate a statistically significant influence on consumer purchasing decisions in both countries. Although promotional campaigns are designed to increase environmental awareness and communicate the environmental benefits of green products, promotional activities alone appear insufficient to influence purchasing behavior once consumers simultaneously evaluate product accessibility and pricing. This finding suggests that consumers increasingly demand credible environmental evidence rather than persuasive promotional messages. Previous studies have emphasized that green advertising can positively influence purchasing behavior when promotional claims are supported by trust, environmental concern, and transparent corporate practices (Hussain et al., 2020; Maziriri, 2020; Mansour et al., 2024). Therefore, promotional strategies that merely emphasize environmental slogans without demonstrating measurable environmental performance may be ineffective in influencing consumer purchasing decisions.

The comparative findings between Indonesia and Malaysia provide additional insights into the contextual nature of green marketing effectiveness. Although the Malaysian model exhibited substantially higher explanatory power ($R^2 = 0.792$) than the Indonesian model ($R^2 = 0.353$), none of the structural relationships reached statistical significance in Malaysia. This apparent inconsistency is most likely attributable to the relatively small Malaysian sample size, which substantially reduced statistical power and increased standard errors during hypothesis testing. Consequently, the Malaysian findings should be interpreted as exploratory rather than definitive. Nevertheless, the relatively large standardized coefficient for Green Price suggests that pricing strategies may still be an important determinant of purchasing decisions among Malaysian consumers and warrants further investigation using larger, more representative samples.

From a theoretical perspective, the findings contribute to the growing body of literature on green marketing by demonstrating that the effectiveness of the traditional green marketing mix is not universally applicable across different national contexts. While previous studies have generally reported positive effects of green marketing dimensions on consumer purchasing behavior (Cherian & Jacob, 2012; Rajput et al., 2022; Mansour et al., 2024), the present study indicates that only selected marketing dimensions remain significant after accounting for the effects of all four components simultaneously. This finding highlights the importance of considering contextual factors, including consumer purchasing power, environmental awareness, market maturity, and institutional support, when evaluating green marketing effectiveness.

The results also have important implications for management accounting. The significant effects of Green Price and Green Place suggest that firms must carefully evaluate the environmental costs associated with sustainable production, logistics, and distribution to ensure that environmentally friendly products remain economically competitive. Investments in cleaner production technologies, sustainable packaging, and environmentally responsible distribution systems inevitably increase production costs, making effective environmental cost management essential for maintaining competitive pricing strategies. Consequently, integrating environmental cost information into managerial decision-making supports more efficient resource allocation while enhancing the credibility of green marketing initiatives. Previous research has similarly emphasized that effective green marketing should be supported by transparent business practices and measurable environmental performance rather than promotional claims alone (Mukonza & Swarts, 2020; Maziriri, 2020; Rajput et al., 2022; Mansour et al., 2024).

From a managerial perspective, the findings suggest several practical recommendations. Companies operating in Indonesia should prioritize improving product accessibility through broader distribution networks while implementing pricing strategies that effectively communicate the long-term value of environmentally friendly products. Marketing managers should also strengthen consumer education regarding the environmental and economic benefits of sustainable products to justify premium pricing. In contrast, organizations operating in Malaysia should continue investing in green marketing initiatives but simultaneously improve consumer awareness and market education to strengthen the effectiveness of these strategies. Policymakers in both countries may further support sustainable consumption by providing incentives for environmentally responsible businesses, promoting environmental literacy, and strengthening regulations that improve consumer confidence in environmental claims.

Finally, this study contributes to the emerging literature on sustainable consumer behavior within Southeast Asia by providing one of the few empirical comparisons between Indonesia and Malaysia using a PLS-SEM Multi-Group Analysis framework. Although the findings confirm that green marketing remains an important strategic tool for promoting sustainable consumption, they also demonstrate that its effectiveness varies considerably across different

national contexts. Future research should incorporate larger and more balanced cross-country samples, integrate additional constructs such as environmental awareness, consumer trust, environmental knowledge, perceived value, and Environmental Cost Integration, and examine the mediating and moderating mechanisms that explain how green marketing strategies influence sustainable purchasing behavior. Such investigations would provide a more comprehensive understanding of consumer decision-making and further advance the theoretical integration of green marketing, sustainability, and management accounting literature.

5. Conclusions

This study examined the influence of the green marketing mix, comprising Green Product, Green Price, Green Place, and Green Promotion, on consumer purchasing decisions in Indonesia and Malaysia using Partial Least Squares Structural Equation Modeling (PLS-SEM) and Multi-Group Analysis (MGA). The findings demonstrate that the effectiveness of green marketing strategies varies across national contexts. In Indonesia, Green Price and Green Place significantly influenced consumer purchasing decisions, indicating that consumers place considerable importance on affordable green pricing and convenient access to environmentally friendly products. In contrast, Green Product and Green Promotion did not exhibit significant effects. Similarly, none of the proposed green marketing dimensions significantly influenced consumer purchasing decisions in the Malaysian sample, although Green Price demonstrated the largest standardized effect among the examined variables. These findings suggest that consumer responses to green marketing strategies differ across countries, depending on market characteristics, purchasing behavior, and environmental awareness.

The study contributes to the green marketing literature by providing comparative empirical evidence from two Southeast Asian countries with different market characteristics. Unlike many previous studies that focused on a single national context, this research demonstrates that the effectiveness of individual green marketing dimensions is not universal. Instead, their influence depends on contextual factors such as market maturity, consumer purchasing power, environmental literacy, and product accessibility. Furthermore, by employing PLS-SEM together with Multi-Group Analysis, this study provides a robust analytical framework for evaluating cross-country differences in sustainable consumer behavior.

From a management perspective, the findings indicate that companies should not rely solely on environmentally friendly product attributes or promotional campaigns to encourage sustainable purchasing. Instead, organizations should prioritize pricing strategies that clearly communicate the value of green products while simultaneously improving product accessibility through efficient and environmentally responsible distribution systems. These findings also reinforce the importance of integrating environmental cost considerations into managerial decision-making. Investments in sustainable production, green logistics, environmentally friendly packaging, and cleaner technologies should be supported by effective environmental cost management to ensure that green marketing initiatives remain financially sustainable while maintaining consumer confidence and organizational competitiveness.

5.1. Research Limitations

Several limitations should be acknowledged when interpreting the findings. First, the study employed a cross-sectional research design, which limits the ability to establish causal relationships between green marketing dimensions and consumer purchasing decisions over time. Consumer perceptions and purchasing behavior may evolve as environmental awareness, government policies, and market conditions continue to change. Second, the study employed a purposive sampling technique, which may limit the generalizability of the findings to broader populations in Indonesia and Malaysia. Third, a substantial imbalance existed between the Indonesian sample ($n = 577$) and the Malaysian sample ($n = 33$). Although non-parametric statistical procedures were employed to improve the robustness of the comparison, the relatively small Malaysian sample reduced statistical power and may have contributed to the non-significant structural relationships observed in that group. Finally, the proposed model focused exclusively on the four dimensions of the green marketing mix without incorporating additional psychological and contextual variables that may influence consumer purchasing decisions.

5.2. Policy Implications

The findings offer several important implications for policymakers, businesses, and sustainability practitioners. Governments in Indonesia and Malaysia should continue promoting sustainable consumption through policies that improve consumer access to environmentally friendly products and encourage firms to adopt transparent, credible green marketing practices. Financial incentives, tax benefits, and subsidies for businesses investing in environmentally responsible production and distribution systems may reduce production costs and enhance the affordability of green products. Regulatory agencies should also strengthen environmental certification systems and monitoring mechanisms to curb greenwashing and enhance consumer trust in environmental claims. Furthermore, public awareness campaigns and environmental education programs should be expanded to enhance consumers' understanding of the

environmental and economic benefits associated with green consumption. For business organizations, the findings suggest that investments should prioritize environmentally responsible distribution networks and value-based pricing strategies rather than relying exclusively on promotional activities. Integrating environmental cost information into management accounting systems can further support strategic decision-making by enabling firms to evaluate the financial efficiency of sustainability initiatives while maintaining long-term competitiveness.

5.3. Future Research

Future studies should address the limitations of the present research by employing larger and more balanced cross-country samples to improve statistical power and the generalizability of the findings. Longitudinal research designs would provide greater insight into how consumer purchasing behavior changes over time as environmental awareness and sustainability policies continue to evolve. Future research should also extend the proposed framework by incorporating additional constructs, including environmental awareness, environmental knowledge, consumer trust, perceived value, environmental concern, perceived behavioral control, and Environmental Cost Integration. Examining the mediating and moderating roles of these variables would provide a more comprehensive understanding of the mechanisms through which green marketing influences consumer purchasing decisions. Moreover, comparative studies involving additional Southeast Asian countries, such as Singapore, Thailand, Vietnam, and the Philippines, would enhance understanding of regional differences in sustainable consumer behavior. Future research may also adopt mixed-methods approaches, combining quantitative analysis with qualitative interviews to gain deeper insights into consumers' motivations, perceptions, and barriers to green purchasing. Such investigations would contribute to the development of more effective green marketing strategies and evidence-based sustainability policies while advancing the integration of marketing, sustainability, and management accounting research.

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