

Factors Affecting the Consumer Intention to Purchase Products with Sustainable Packaging in the E-Commerce Industry

Yee Jing Foo

Faculty of Business and Management, UCSI University, Malaysia
Email: yeejf@ucsiuniversity.edu.my

Soo Xin Lin

Faculty of Business and Management, UCSI University, Malaysia
Email: sooxl@ucsiuniversity.edu.my

Leow Hon Wei

Faculty of Business and Management, UCSI University, Malaysia
Email: leowhw@ucsiuniversity.edu.my

ABSTRACT

The rapid expansion of the e-commerce industry in Malaysia has led to a significant increase in packaging consumption, particularly plastic, which contributes to growing environmental concerns. Although sustainable packaging alternatives are accessible and consumer awareness regarding environmental protection is increasing, a gap exists between consumers' awareness and their actual purchasing behavior concerning products with sustainable packaging. This study aims to identify and analyze the key factors influencing the intention to purchase products with sustainable packaging in the context of e-commerce. Based on the Theory of Planned Behavior (TPB), the research investigates the role of customer perception, government initiatives, subjective norms, willingness to pay, and environmental awareness. A quantitative research design was employed, and data were gathered through structured questionnaires distributed to 384 respondents. The data were analyzed using the Statistical Package for the Social Sciences (SPSS). The results demonstrate that customer perception, government involvement, willingness to pay, and environmental awareness significantly influence consumer purchase intention. However, subjective norms do not demonstrate a significant effect. These findings offer important insights for e-commerce businesses and policymakers seeking to promote sustainable consumption behavior and implement effective strategies for environmental sustainability. By applying these insights, stronger cooperation between businesses, packaging manufacturers, and policymakers can accelerate the transition toward sustainable packaging. This, in turn, will help reduce plastic waste, benefiting both the environment and the economy.

Keywords: *consumer behavior, e-commerce, environmental awareness, purchase intention, sustainable packaging.*

1. INTRODUCTION

The digital transformation of retail and the accelerated shift toward online shopping, particularly during and after the COVID-19 pandemic, have driven the expansion of e-commerce in Malaysia. This increase in online transactions has been accompanied by a rise in packaging materials, predominantly plastic. Global plastic packaging for e-commerce is projected to reach around 4.5 billion pounds by 2025 (Chandwani, 2024). These packages are essential for protecting goods during delivery, have contributed to increased plastic waste, and pose significant environmental threats (Mokhtar & Shamsuddin, 2024). In Malaysia, an estimated 0.14 to 0.37 million tonnes of improperly managed plastic waste is in the ocean, adding to the 0.94 million tonnes of plastic waste the country generates (Mokhtar & Shamsuddin, 2024). Accordingly, Malaysia has been identified as one of the region's largest contributors to plastic waste (Ng *et al.*, 2023). Hence, there is an urgent need to understand consumer behavior toward sustainable packaging, given its essential role in reducing the environmental burden of plastic waste. Insights from this study not only provide practical implications for Malaysian businesses and policymakers but also extend to other emerging markets facing similar challenges of balancing e-commerce growth and environmental sustainability.

In recent years, various strategies have been enacted to reduce plastic usage in traditional brick-and-mortar retail outlets, including bans on plastic bags, incentives for reusable packaging, and extended producer responsibility (EPR) schemes. However, in the context of e-commerce, the application of such strategies remains limited. Packaging for online shopping is often more extensive due to the need for secure delivery, and there is currently a lack of comprehensive guidelines and industry standards to encourage the use of sustainable materials in this domain (Chen *et al.*, 2021). As the e-commerce market continues to expand, understanding consumer behavior in adopting sustainable packaging for online shopping is important.

Furthermore, consumers are increasingly aware of the environmental consequences of their consumption habits and

express a willingness to support eco-friendly initiatives; however, their actual behavior does not always reflect these intentions (Dagher *et al.*, 2015). This limitation is particularly evident in e-commerce, where sustainable packaging decisions remain understudied and sustainability cues are often less visible on digital platforms. To address such behavioral inconsistencies, the Theory of Planned Behavior (TPB) was employed as the foundation in this study. While TPB has been extensively used to examine sustainable product consumption (Ahnaf Chowdhury Niloy *et al.*, 2023; Jia *et al.*, 2024), its application in e-commerce packaging sustainability remains limited. Considering Malaysia's dual position as both a rapidly expanding e-commerce market and a major generator of plastic waste, examining TPB in this environment provides an opportunity to extend theoretical insights while generating practical strategies for encouraging sustainable online consumption.

Accordingly, existing studies have shown that different factors may influence consumer behavior regarding sustainable packaging. Consumers' perception is shaped by their expectations of sustainable packaging, and consistent fulfillment of these expectations encourages them to adopt it (Esvandiari *et al.*, 2023). Additionally, governments play a crucial role in advancing sustainable packaging by offering financial incentives and establishing regulations that influence both businesses and consumers (Moorthy *et al.*, 2021). Furthermore, Duarte *et al.*, (2024) indicate that consumers who are more aware of the environmental benefits of eco-friendly packaging are more willing to pay a premium for it. However, these factors were not examined in the context of e-commerce.

Despite increasing awareness of environmental issues, consumer intentions to adopt sustainable packaging in e-commerce remain poorly understood, particularly in emerging markets such as Malaysia. Existing research has not sufficiently explored the factors influencing this intention-behavior gap in the online shopping context. This research applies the Theory of Planned Behavior (TPB) to the Malaysian e-commerce context, as its constructs more accurately predict and explain consumer behavior and intentions. Specifically, the study incorporates three TPB factors: customer perception, subjective norms, and government role, with the addition of three constructs, which are government role, willingness to pay, and environmental awareness (Esvandiari *et al.*, 2023; Duarte *et al.*, 2024; Moorthy *et al.*, 2021). By identifying these factors, the research aims to offer practical implications for businesses, packaging manufacturers, and policymakers.

2. LITERATURE REVIEW

This study is anchored in the Theory of Planned Behavior (TPB), which posits that behavior is determined by intention, which in turn is influenced by attitude, subjective norms, and perceived behavioral control (Ajzen, 2020). The TPB has been extensively applied in sustainability research to explain consumer actions regarding green products and services. While TPB has been effective in explaining consumer behavior in traditional brick-and-mortar settings, its application in e-commerce presents several limitations. In physical retail environments, attitudes, social influence, and perceived behavioral control are often sufficient to predict

purchase intentions, as consumers engage directly with products, packaging, and sales staff (Paul *et al.*, 2016). In contrast, in e-commerce, consumers adopt a largely passive role after placing an order, as packaging is managed by retailers and logistics providers (Klein & Popp, 2023). Recent studies also show that consumers consistently evaluate the environmental sustainability of e-commerce lower than that of physical retailing, particularly in relation to packaging waste (Risher *et al.*, 2020). Such findings reveal the limitations of TPB, as they highlight a discrepancy between consumers' environmental attitudes and their actual perception of e-commerce sustainability (Rao *et al.*, 2021). Hence, including additional context-specific variables, such as willingness to pay and environmental awareness, enhances the explanatory power of TPB in this study.

TPB recognizes intention as the most immediate predictor of behavior (Ajzen, 2020). Since the concept of purchasing sustainable packaging products in Malaysia is relatively low, consumers may have limited opportunities to act on their preferences due to the lack of visible or widely available sustainable packaging options on online platforms (Rajendran *et al.*, 2019). Hence, it may provide limited insight if this study measures behavior under such conditions. Moreover, intention is particularly important in the e-commerce context because it represents a forward-looking indicator of how consumers will respond once sustainable packaging becomes more accessible and standardized in the e-commerce industry. Thus, by examining intention and its underlying determinants, this study provides valuable insights into the potential drivers of future behavior. Consequently, this study will focus on consumer intention rather than actual behavior.

2.1 Customer Perception

Customer perception is a critical factor in shaping attitudes. Perception develops through how individuals interpret information and past experiences, influencing consumer decision-making (Esvandiari *et al.*, 2023; Shafiquzzaman *et al.*, 2018). Packaging characteristics, such as size and novel features, can create competitive advantages by matching consumer needs and market trends (Kuncoro & Suriani, 2018). Perception is also linked to quality, as consumers assess whether packaging meets their expectations and provides value assurance (Turkcu & Tura, 2023). Norton *et al.*, (2018) and Esvandiari *et al.*, (2023) stressed that positive perceptions improve the credibility and attractiveness of products using sustainable packaging. Furthermore, perceived convenience and durability are essential in shaping consumer preferences (Turkcu & Tura, 2023; Lai *et al.*, 2022). In the online retail environment, where packaging is only visible after the purchase, the perceived value and functionality of the packaging become even more significant in influencing future buying decisions.

H1: Customer perception significantly and positively affects customer intention to buy products with sustainable packaging.

2.2 Environmental Awareness

Environmental awareness encompasses both objective knowledge (what consumers know) and subjective knowledge (what they believe they know). According to Jaiswal and Kant (2018) and Si *et al.*, (2022), increased environmental awareness leads to stronger intentions to

adopt environmentally responsible behaviors. This includes selecting products with sustainable packaging and supporting businesses that align with environmental values. Prakash and Pathak (2017) noted that emotionally engaged consumers who understand the broader consequences of plastic waste are more proactive in seeking sustainable alternatives. In e-commerce, where direct contact with products is limited, digital tools such as eco-labels, informational cues, and transparent disclosures can enhance environmental awareness and foster trust in sustainable claims.

H2: Environmental awareness significantly and positively affects customer intention to buy products with sustainable packaging.

2.3 Government Role

The role of government is also extensively studied in shaping consumer behavior through policies, incentives, and public awareness campaigns. Moorthy *et al.*, (2021) observed that stringent environmental regulations, subsidies for eco-friendly materials, and clear labeling requirements significantly encourage the adoption of sustainable packaging. Doan and Nguyen (2024) highlighted that government-led environmental education programs have a lasting impact on building consumer trust and motivation to engage in green practices. Moreover, active enforcement and monitoring mechanisms play a crucial role in ensuring that both businesses and consumers comply with sustainable packaging norms (Thapliyal *et al.*, 2024). In the absence of such measures, especially in e-commerce, sustainable practices may remain superficial or inconsistent. Hence, governmental support is essential to shape the purchase intention of products with sustainable packaging.

H3: Government role significantly and positively affects customer intention to buy products with sustainable packaging.

2.4 Subjective Norm

Subjective norms, as outlined in the Theory of Planned Behavior (TPB), refer to the impact of social expectations on individual behavior (Ng *et al.*, 2024). Augustine (2019) explains that if individuals believe their family, friends, or close social circles expect them to engage in environmentally friendly behaviors, such as purchasing products with sustainable packaging, they are more inclined to comply. This highlights the importance of normative beliefs in shaping consumer actions. Minton *et al.*, (2018) further argue that subjective norms, also known as social norms, play a significant role in group dynamics and have a substantial influence on fluctuating green purchasing behavior. Moreover, Xu *et al.*, (2022) note that consumers who observe others in their social group buying green products may develop an implicit interest in sustainable packaging. This subtle influence of group behavior can markedly sway individual purchasing decisions. Therefore, subjective norms become powerful motivators that encourage consumers to adopt environmentally responsible choices, such as using products with sustainable packaging.

H4: Subjective norms significantly and positively affect customer intention to buy products with sustainable packaging.

2.5 Willingness to Pay

Willingness to pay is defined as the maximum amount consumers are prepared to spend to purchase or use a product or service, and several studies have employed willingness to pay as an indicator of sustainable consumption (Chen *et al.*, 2021). The willingness to pay for sustainable packaging products reflects an aspect of environmental responsibility and significantly influences consumer purchasing behavior. Research indicates that consumers who recognize the environmental benefits of eco-friendly packaging are often willing to pay a premium, with environmentally conscious individuals showing less price sensitivity and a stronger preference for sustainable options (Gomes *et al.*, 2023). Mahmoud *et al.*, (2022) highlights that willingness to pay includes the consideration of environmental awareness, income level, brand reputation, and product quality. Moreover, Duarte *et al.*, (2024) emphasize that providing clear and accessible information about the benefits of sustainable packaging further strengthens consumers' willingness to invest in such products. When consumers understand the tangible impact of their choices, they feel empowered to contribute to environmental preservation. Overall, willingness to pay is central to demand forecasting. In sustainability contexts, price strongly influences consumer choices, as green products are often perceived as more costly (Mahmoud *et al.*, 2022). While existing studies focus mainly on Western consumers, uncertainty remains regarding Malaysian consumers' willingness to spend on green packaging.

H5: Willingness to pay significantly and positively affects customer intention to buy products with sustainable packaging.

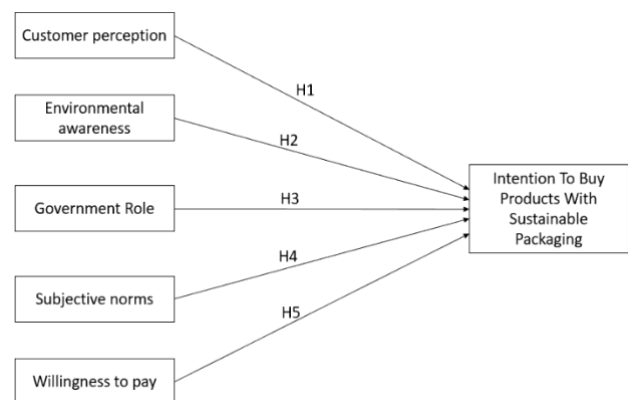


Figure 1 Hypotheses for relationships among different factors with customer intention to purchase products with sustainable packaging

These studies provide a strong theoretical and empirical basis for investigating the factors influencing consumer intention in the sustainable packaging domain. However, the majority of the existing literature focuses on physical retail settings or generalized eco-friendly behavior, with relatively few studies directly examining sustainable packaging in the e-commerce context. This gap emphasizes the need for more focused research on online shopping behavior, especially in developing countries such as Malaysia, where digital commerce is expanding rapidly, but environmental regulations and practices in the sector continue evolving.

Table 1 Respondent demographics

Demographic Items	Categories	Frequency	Percentage (%)
	21-30 years old	189	49.2
	31-40 years old	85	22.1
	41-50 years old	6	1.6
	50 years old or above	1	0.3
Gender	Male	173	45.1
	Female	211	54.9
Level of Education	Secondary school	21	5.5
	Certificate	43	11.2
	Diploma	115	29.9
	Degree	200	52.1
	Postgraduate	5	1.3
Income	RM2,500 or below	180	46.9
	RM2,501 – RM4,850	150	39.1
	RM4,851 – RM7,100	48	12.5
	RM7,101 and above	6	1.5

3. METHODOLOGY

A quantitative research design was employed to examine the relationships among the proposed independent variables and consumer intention to purchase products with sustainable packaging. In this study, the target population consisted of approximately 10,670,000 e-commerce users in Malaysia (Siddharta, 2024). Based on Krejcie and Morgan’s (1970) sample size determination table, a scientifically reliable sample of 384 respondents was identified as sufficient to ensure representativeness at a 95% confidence level with a 5% margin of error (Ahmad & Halim, 2017). The respondents were selected using simple random sampling to achieve equal representation (Ahmed, 2024). To approximate randomness and reduce selection bias, the survey link was distributed widely across online platforms, including social media and e-commerce consumer groups. Participation was restricted to consumers with prior online purchase experience to ensure that respondents had direct exposure to online shopping. A total of 403 responses were collected; however, 19 responses were excluded during screening because the respondents lacked online purchase experience. The frequency analysis was conducted to analyse the demographic data of 384 respondents as shown in the table below

Data were collected through a self-administered online survey divided into two main sections. Prior to participation, respondents received an information sheet outlining the study's purpose, their rights as participants, and assurances of confidentiality and anonymity. Informed consent was obtained electronically before respondents proceeded with the questionnaire, and participation was entirely voluntary. The first section gathered demographic data, while the second contained statements measuring the five independent variables and the dependent variable using a five-point Likert scale. A summary of the questionnaire is presented in Table 2. A pilot test was conducted with 30 respondents to evaluate the reliability of the measurement items. The results indicated that all constructs achieved Cronbach’s Alpha values exceeding the recommended threshold of 0.70, as shown in Table 3, thereby confirming sufficient internal consistency (Ahmad *et al.*, 2024; Bujang *et al.*, 2024).

4. RESULTS

This study employed partial least squares (PLS) modeling using the SmartPLS 3.2.8 version (Ringle *et al.*, 2005) as the statistical tool to evaluate the measurement and structural model, since it does not require the normality assumption, and survey research is generally not normally distributed (Chin *et al.*, 2003). Because data was collected from a single source, we first tested for Common Method Bias by following the recommendations of Kock and Lynn (2012) and Kock (2015) through testing full collinearity. In this method, all variables are regressed against a common variable, and if the VIF ≤ 3.3 , then there is no bias from the single-source data. The analysis yielded VIF values less than 3.3, indicating that single-source bias is not a significant issue for our data.

Note: CP = Customer Perception, EA = Environmental Awareness, GR = Government Role, SN = Subjective Norm, WP = Willingness to Pay

4.1 Measurement Model

We followed the suggestions of Anderson and Gerbing (1988) to evaluate the model developed using a 2-step approach. First, we assessed the measurement model to examine the validity and reliability of the instruments used following the guidelines of Hair *et al.*, (2019) and Ramayah *et al.*, (2018); then, we ran the structural model to evaluate the hypothesis developed. For the measurement model we assessed the loadings, average variance extracted (AVE), and composite reliability (CR). The values of loadings should be ≥ 0.5 , the AVE should be ≥ 0.5 , and the CR should be ≥ 0.7 . As shown in Table 5, the AVEs are all greater than 0.5, and the CRs are all greater than 0.7. The measurement model was valid and reliable (Hair *et al.*, 2019).

In step 2, we assessed the discriminant validity using the HTMT criterion suggested by Henseler *et al.*, (2015) and updated by Franke and Sarstedt (2019). The HTMT values should be ≤ 0.85 , the stricter criterion. As shown in Table 6, the HTMT values were all lower than the stricter criterion of ≤ 0.85 ; thus, we can conclude that the respondents understood that the six constructs are distinct. Taken together, both these validity tests have shown that the

Table 2 Questionnaire Items

Variables	Items	Questions	Sources
Customer perception (CP)	CP 1	I believe sustainable packaging helps reduce environmental waste.	(Jindal, 2022; Lan <i>et al.</i> , 2023)
	CP 2	I think plastic packaging has a high negative impact on the environment.	
	CP 3	I believe that sustainable packaging is as durable as conventional packaging.	
	CP 4	Sustainable packaging involves innovative designs that are not found in conventional packaging.	
	CP 5	Products with sustainable packaging provide good quality assurance.	
	CP 6	I believe using recyclable materials makes sustainable packaging a better choice.	
Government role (GR)	GR 1	The government should apply eco-friendly laws on consumers when disposing of the packaging they purchased	(Munasinghe and Shantha, 2021; Xie <i>et al.</i> , 2021)
	GR 2	The government should subsidize research on technology for recycling packaging waste.	
	GR 3	Government policy has a good role in supervising enterprises to deal with the problem of overpackaging.	
	GR 4	Government policy has a good management effect on enterprises dealing with overpackaging.	
	GR 5	Government policy has played a role in encouraging and guiding consumers to use green packaging and reduce packaging.	
Subjective norms (SN)	SN 1	I always discuss environmental issues with my peers and family members.	(Guo <i>et al.</i> , 2023; Mongula <i>et al.</i> , 2023)
	SN 2	I learnt about packaging waste issues from my peers and family members.	
	SN 3	I learnt about sustainable packaging products from my peers and family members.	
	SN 4	Most of my closest friends advise me to purchase products with sustainable packaging.	
	SN 5	Many people around me purchase products with sustainable packaging.	
	SN 6	I am under social pressure to purchase products with sustainable packaging.	
Willingness to pay (WP)	WP 1	I agree to pay more for products with sustainable packaging.	(Duarte <i>et al.</i> , 2024; Rocha, 2021)
	WP 2	I am proud to have products with sustainable packaging in my home, even though they are more expensive than products with conventional packaging.	
	WP 3	I would be willing to pay more to buy products with packaging that is less harmful to the environment.	
	WP 4	I agree that all packaging should be sustainable, even if it requires a small price charge.	
Environmental awareness (EA)	EA 1	I feel angry and frustrated when I think about the damage that pollution does to plant and animal life.	(Duarte <i>et al.</i> , 2024; Rocha, 2021)
	EA 2	I should consider the environmental impact of the products I buy.	
	EA 3	The environment is my biggest concern.	
	EA 4	I am emotionally involved in environmental protection issues.	
	EA 5	I often think about how environmental quality can be improved.	
	EA 6	I am concerned about the deterioration in the quality of the environment.	
Intention to purchase products with sustainable packaging (IP)	IP 1	For sustainability, I will consider switching to brands that sell their products with sustainable packaging.	(Duarte <i>et al.</i> , 2024; Prakash & Pathak, 2017; Guo <i>et al.</i> , 2023)
	IP 2	In the future, I hope to buy products with sustainable packaging for their positive environmental contribution.	

Table 2 Questionnaire Items (Cont'd)

Variables	Items	Questions	Sources
	IP 3	I will consider buying products with sustainable packaging because they are less polluting.	(Jindal, 2022; Lan <i>et al.</i> , 2023)
	IP 4	I want to spend more money on products with sustainable packaging than those with conventional packaging.	
	IP 5	If I had a choice, I would buy particular products that use biodegradable plastic in packaging.	
	IP 6	I plan to buy sustainable packaged products on a regular basis.	
	IP 7	My willingness to buy products with sustainable packaging is high.	

Table 3 Reliability Test for Pilot Test

Variables	Number of Items	Cronbach's Alpha
Customer perception (CP)	6	0.780
Government role (GR)	5	0.723
Subjective norm (SN)	6	0.870
Willingness to pay (WP)	4	0.841
Environmental awareness (EA)	6	0.739
Intention to buy products with sustainable packaging (IP)	7	0.873

Table 4 Full collinearity testing

CP	EA	GR	SN	WP
1.241	1.814	1.234	1.737	1.607

Table 5 Measurement model

	Items	Loadings	AVE	CR	Cronbach's alpha
Customer Perception	CP2	0.760	0.536	0.774	0.712
	CP3	0.615			
	CP6	0.807			
Environmental Awareness	EA3	0.694	0.532	0.819	0.723
	EA4	0.802			
	EA5	0.715			
	EA6	0.700			
Government Role	GR3	0.691	0.585	0.808	0.709
	GR4	0.836			
	GR5	0.760			
Subjective Norm	SN1	0.762	0.600	0.900	0.890
	SN2	0.700			
	SN3	0.776			
	SN4	0.830			
	SN5	0.846			
	SN6	0.724			
Willingness to Pay	WP1	0.821	0.591	0.852	0.789
	WP2	0.665			
	WP3	0.786			
	WP4	0.795			
Intention to buy products with sustainable packaging	IP1	0.694	0.500	0.875	0.836
	IP2	0.650			

Table 5 Measurement model (Cont'd)

	Items	Loadings	AVE	CR	Cronbach's alpha
	IP3	0.718			
	IP4	0.611			
	IP5	0.734			
	IP6	0.746			
	IP7	0.784			

Note: To get better reliability and discriminant validity, lower loadings Item CP1, CP4, CP5, EA1, EA2, GR1, GR2 were dropped

Table 6 Discriminant Validity (HTMT)

	CP	EA	GR	IP	SN	WP
CP						
EA	0.413					
GR	0.558	0.413				
IP	0.701	0.660	0.650			
SN	0.329	0.750	0.299	0.399		
WP	0.522	0.675	0.440	0.743	0.583	

Note: CP = Customer Perception, EA = Environmental Awareness, GR = Government Role, IP = Intention to buy products with sustainable packaging, SN = Subjective Norm, WP = Willingness to Pay

measurement items are valid and reliable. Multiple linear regression analysis further confirmed that customer perception ($\beta = 0.221, p < 0.01$), government role ($\beta = 0.246, p < 0.01$), willingness to pay ($\beta = 0.260, p < 0.01$), and environmental awareness ($\beta = 0.339, p < 0.01$) were significant predictors of purchase intention. Conversely, subjective norms were found to be statistically insignificant ($\beta = -0.051, p = 0.072$). The overall model was significant ($F(5, 378) = 91.796, p < 0.01$) and explained 54.8% of the variance in purchase intention ($R^2 = 0.548$).

4.2 Structural Model

As suggested by Hair *et al.* (2017) and Cain *et al.*, (2017), we assessed the multivariate skewness and kurtosis. The results showed that the data we collected were not multivariate normal, Mardia's multivariate skewness ($\beta = 7.421, p < 0.01$), and Mardia's multivariate kurtosis ($\beta = 51.543, p < 0.01$); thus, following the suggestions of Hair *et al.*, (2019), we reported the path coefficients, standard errors, t-values, and p-values for the structural model using a 5,000-sample re-sample bootstrapping procedure (Ramayah *et al.*, 2018). Also, based on the criticism of Hahn and Ang (2017) that p-values are not a good criterion for testing the significance of hypotheses, they suggested using a combination of criteria such as p-values, confidence intervals, and effect sizes. Table 7 shows the summary of the criteria we used to test the hypotheses developed.

First, we tested the effect of the five predictors on IP; the R2 was 0.586 ($Q2 = 0.266$), which shows that all four predictors explained 58.6% of the variance in IP. Customer Perception ($\beta = 0.235, p < 0.01$), Environmental Awareness ($\beta = 0.252, p < 0.01$), Government Role ($\beta = 0.231, p < 0.01$), and Willingness to pay ($\beta = 0.351, p < 0.01$) were all positively related to IP; thus, H1, H2, H3, and H5 were supported. However, Subjective Norm ($\beta = -0.059, p > 0.01$) did not significantly influence IP; thus, H4 was rejected.

5. DISCUSSION

The results of this study emphasize the significant influence of customer perception, government role, willingness to pay, and environmental awareness on consumers' intention to purchase products with sustainable packaging in the e-commerce context. Customer perception was found to have a positive and significant effect on purchase intention, indicating that how consumers interpret information about packaging affects their purchasing behavior (Esvandiari *et al.*, 2023). As Norton *et al.*, (2018) explained, consumers' perception is shaped by the quality, innovation, and environmental message conveyed through the packaging. If consumers believe sustainable packaging contributes to environmental preservation and offers comparable durability and quality to conventional packaging, they are more likely to support such products. Furthermore, Turkcu and Tura (2023) suggest that narrowing the gap between consumer expectations and perceived packaging quality enhances trust, thus strengthening purchase intention. This finding suggests that e-commerce businesses should invest in the design and communication strategies of their packaging to positively influence consumer perception.

The government's role also showed a significant and positive relationship with consumer intention to purchase sustainable packaging, supporting previous findings by Moorthy *et al.*, (2021). Policies, regulations, and financial incentives that promote sustainable practices create an environment where both businesses and consumers are encouraged to adopt greener alternatives. Government-led awareness campaigns also help inform the public about the impact of packaging waste, thereby increasing consumer readiness to act sustainably (Doan & Nguyen, 2024). When consumers recognize the government's efforts in promoting eco-friendly consumption, it builds confidence in sustainable

Table 7 Hypothesis testing

Hypothesis	Relationship	Std Beta	Std Error	t-values	P values	BCI LL	BCI UL	f ²	VIF
H1	CP -> et aIP	0.235	0.045	5.175	0.000	0.172	0.317	0.080	1.241
H2	EA -> IP	0.252	0.055	4.626	0.000	0.179	0.360	0.132	1.814
H3	GR -> IP	0.231	0.047	4.823	0.000	0.164	0.314	0.085	1.234
H4	SN -> IP	-0.059	0.050	1.199	0.115	-0.146	0.020	0.007	1.737
H5	WP -> IP	0.351	0.051	6.977	0.000	0.272	0.436	0.111	1.607

Note: We use a 95% confidence interval with a bootstrapping of 5,000

Table 8 PLS-Predict

	Q ² predict	RMSE	MAE	RMSE	MAE	RMS	MAE
IP1	0.233	0.524	0.436	0.545	0.450	-0.021	-0.014
IP2	0.174	0.512	0.443	0.500	0.409	0.012	0.034
IP3	0.242	0.489	0.414	0.488	0.388	0.001	0.026
IP4	0.263	0.565	0.432	0.583	0.446	-0.018	-0.014
IP5	0.280	0.483	0.415	0.495	0.410	-0.012	0.005
IP6	0.321	0.495	0.404	0.513	0.404	-0.018	0.000
IP7	0.314	0.536	0.419	0.559	0.434	-0.023	-0.015

products and reinforces their purchase intentions (Chen *et al.*, 2021). This result highlights the importance of public policy in guiding sustainable consumer behavior and calls for further engagement from regulatory bodies in Malaysia to support green packaging initiatives.

Willingness to pay emerged as a strong predictor of purchase intention, confirming the findings of Al Mamun *et al.*, (2022) and Gomes *et al.*, (2023), who found that consumers aware of the environmental benefits of sustainable packaging are more inclined to pay a premium for such products. Modern consumers often associate sustainable packaging with responsible consumption and are willing to support brands that reflect their environmental values (Al Mamun *et al.*, 2018). Duarte *et al.*, (2024) also pointed out that consumers who understand the value of sustainability are less price-sensitive and more emotionally committed to environmentally friendly choices. Therefore, companies should clearly communicate the environmental benefits of their packaging and the rationale for any price premiums to justify value and strengthen trust.

Environmental awareness also significantly influenced purchase intention, reinforcing that knowledge about environmental issues motivates pro-environmental behavior (Al Mamun *et al.*, 2022; Jaiswal & Kant, 2018). As explained by Si *et al.*, (2022), environmental awareness includes both subjective knowledge (how much consumers think they know) and objective knowledge (what they actually know) about environmental issues. Consumers who are well-informed about the ecological impact of plastic waste are more likely to consider the long-term effects of their purchases. Prakash and Pathak (2017) suggest that consumers who are emotionally and cognitively engaged with environmental protection are more likely to adopt green behavior, such as choosing sustainable packaging over conventional alternatives. Thus, increasing public environmental literacy through education and marketing can be an effective approach to drive sustainable consumption.

Contrary to expectations and the predictions of TPB, subjective norms did not show a significant effect on consumer intention in this study. This finding aligns with the research of Zhao *et al.*, (2025) and Paul *et al.*, (2016), who also found that social pressure does not always translate into behavioral intention in sustainability contexts. While TPB identifies subjective norms as a core component of behavioral intention, it appears that, in the Malaysian e-commerce context, sustainability-related decisions are often personal and less influenced by peer or family expectations. Moazzam *et al.*, (2023) noted that although social influence may be relevant in face-to-face purchasing scenarios or public behaviors, it may be weaker in private online settings where packaging choices are less visible. Additionally, discussions around packaging sustainability might not be prevalent in everyday social interactions, reducing the impact of social expectations on individual decisions (Chaudhary & Bisai, 2018).

Further to that, as suggested by Shmueli *et al.*, (2019), they proposed PLSpredict, a holdout sample-based procedure that generates case-level predictions at an item or construct level using PLS-Predict with a 10-fold procedure to check for predictive relevance. Shmueli *et al.*, (2019) indicated that if all item differences (PLS-LM) were lower, there is strong predictive power; if all are higher, predictive relevance is not confirmed; if the majority are lower, there is moderate predictive power; and if the minority are then there is low predictive power. Based on Table 8, most errors of the PLS model were lower than the LM model; thus, we conclude that our model has moderate predictive power.

In summary, the findings of this study highlight the central role of individual attitudes and knowledge rather than social pressures in influencing sustainable consumption behavior in the e-commerce sector. By identifying customer perception, government role, willingness to pay, and environmental awareness as key determinants of purchase intention, this research supports the extension of the TPB framework to include environmental and economic factors.

6. RESULTS

This study provides empirical evidence that consumer perception, government involvement, willingness to pay, and environmental awareness strongly influence the intention to purchase products with sustainable packaging in the context of Malaysian e-commerce. These findings emphasize the importance of addressing environmental concerns through policy and education and ensuring that businesses engage consumers by improving the quality and appeal of sustainable packaging. From a business perspective, companies can enhance brand reputation and customer loyalty by aligning packaging strategies with these factors and by communicating the functional and environmental benefits to justify price differences. For the packaging industry, the results highlight the need for cost-effective, innovative solutions that balance sustainability and affordability. Policymakers also play a crucial role by introducing regulations, incentives, and subsidies to reduce financial barriers and assist businesses in adopting sustainable packaging. Collaboration among businesses, packaging producers, and government can speed the transition toward sustainable practices, helping to reduce plastic waste while also contributing to economic growth and job creation.

Interestingly, subjective norms did not significantly influence purchase intention, suggesting that individual values and awareness may play a more vital role than social pressure in this context. Accordingly, consumers perceive that the approval of significant others is not an important factor when purchasing green products. Friends, family members, and peer groups have not provided a strong positive influence or encouragement to motivate consumers to buy green products (Paul *et al.*, 2016). A possible explanation may lie in the cultural and contextual characteristics of consumers, where sustainable purchasing decisions appear to be shaped more strongly by personal values, awareness, and individual responsibility rather than social pressure. In a rapidly growing digital marketplace, consumers may also feel less influenced by peer norms due to the private nature of online shopping compared to physical retail, where social visibility is more prominent (Zamfirache *et al.*, 2024). This calls for a deeper investigation into cultural and contextual factors that mediate the role of social influence in sustainable consumer behavior.

Finally, it is worth mentioning that this research has some limitations. Recognizing these constraints not only clarifies the scope of the present study but also highlights opportunities for future research to build upon its findings. Although this study provides valuable insights into consumer intention toward purchasing products with sustainable packaging, it does not examine actual purchasing behavior. This limitation reflects the intention and behavior gap, where positive intentions may not always translate into real actions due to contextual, structural, or situational barriers (Rajendran *et al.*, 2019). In the Malaysian e-commerce context, such barriers may include limited availability, higher costs, or lack of awareness at the point of purchase. Recognizing this gap, future research should extend the present study by incorporating measures of actual behavior to validate whether the identified determinants of intention also drive real consumer actions. Besides that, the survey

was only in English, which may have introduced sampling bias by overrepresenting educated respondents and excluding non-English speakers. Additionally, while key factors such as perception, government role, subjective norms, willingness to pay, and environmental awareness were examined, other relevant variables (e.g., brand reputation, social media marketing) were not considered, limiting the comprehensiveness of the findings. Finally, the exclusive use of quantitative methods may have restricted the depth of insights into consumer behavior, suggesting that future studies incorporate qualitative approaches for a broader understanding. Future research could adopt a mixed-methods approach by including qualitative techniques, such as interviews or focus groups, to complement quantitative findings. Such methods would provide richer insights into the underlying factors that shape consumers' intentions to purchase products with sustainable packaging, as their experiences, opinions, and perceptions may reveal valuable perspectives on the decision-making process.

REFERENCES

- Ahmad, H., & Halim, H. (2017). Determining sample size for research activities. *Selangor Business Review*, 2(1), pp. 20–34. Retrieved from <https://sbr.journals.unisel.edu.my/ojs/index.php/sbr/article/view/12>
- Ahmad, N., Alias, F. A., Hamat, M., & Mohamed, S. A. (2024). Reliability analysis: Application of Cronbach's alpha in research. *Pioneering The Future: Delving Into E-Learning's Landscapes*, 8, 114.
- Ahmed, S. K. (2024). How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports*, 12, 100662. <https://doi.org/10.1016/j.oor.2024.100662>
- Ahnaf Chowdhury Niloy, Sultana, J., Jawad bin Alam, Ghosh, A., & Farhan, K. M. (2023). What triggers you to buy green products? Explaining through an extended TPB model. *Asia-Pacific Journal of Management Research and Innovation*, 19(1), pp. 25–39. <https://doi.org/10.1177/2319510x231171195>
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), pp. 411–423.
- Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), pp. 314–324.
- Al Mamun, A., Fazal, S., Ahmad, G., Yaacob, M., & Mohamad, Mohd. (2018). Willingness to pay for environmentally friendly products among low-income households along coastal peninsular Malaysia. *Sustainability*, 10(5), 1316. <https://doi.org/10.3390/su10051316>
- Augustine, A. A., Rindita, A. S., & Muniandy, S. L. (2019). Factors influencing the purchase behavior of sustainable fashion among millennial consumers in Kuala Lumpur. *Proceedings of the 2nd International Conference on Big Data Technologies - ICBDT2019*. <https://doi.org/10.1145/3358528.3358533>
- Bujang, M. A., Omar, E. D., Foo, D. H. P., & Hon, Y. K. (2024). Sample size determination for conducting a pilot study to assess reliability of a questionnaire. *Restorative Dentistry & Endodontics*, 49(1). <https://doi.org/10.5395/rde.2024.49.e3>
- Cain, M. K., Zhang, Z., & Yuan, K. H. (2016). Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation. *Behavior Research Methods*, 49(5), pp. 1716–1735.

- Chandwani, S. (2024, August 2). *9 Key Ecommerce Packaging Statistics to Know in 2024*. Mailmodo. <https://www.mailmodo.com/guides/ecommerce-packaging-statistics/>
- Chaudhary, R., & Bisai, S. (2018). Factors influencing green purchase behavior of millennials in India. *Management of Environmental Quality: An International Journal*, 29(5), pp. 798–812. <https://doi.org/10.1108/meq-02-2018-0023>
- Chen, H. L., Nath, T. K., Chong, S., Foo, V., Gibbins, C., & Lechner, A. M. (2021). The plastic waste problem in Malaysia: Management, recycling and disposal of local and global plastic waste. *SN Applied Sciences*, 3, pp. 1–15. <https://doi.org/10.1007/s42452-021-04234-y>
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a monte carlo simulation study and an electronic-mail emotion adoption study. *Information Systems Research*, 14(2), pp. 189–217.
- Dagher, G., Itani, O., & Kassab, A. N. (2015). The impact of environment concern and attitude on green purchasing behavior: Gender as the moderator. *Contemporary Management Research*, 11(2). <https://doi.org/10.7903/cmr.13625>
- Doan, T. M. H., & Nguyen, B. T. (2024). Promoting the use of sustainable packaging in urban areas: A regulatory policy contribution. *Journal of Governance & Regulation*, 13(4), pp. 27–34. <https://doi.org/10.22495/jgrv13i4art3>
- Duarte, P., Silva, S. C., Roza, A. S., & Dias, J. C. (2024). Enhancing consumer purchase intentions for sustainable packaging products: An in-depth analysis of key determinants and strategic insights. *Sustainable Futures*, 7, 100193. <https://doi.org/10.1016/j.sfr.2024.100193>
- Esvandiyari, M., Susan, M., Mulyaningsih, H. D., Muhardi, Oktini, D. R., & Nurhayati, N. (2023). The effect of eco-friendly packaging on purchase intention with consumer perception as an intervening variable. *International Journal of Entrepreneurship and Sustainability Studies*, 3(2), pp. 62–79. <https://doi.org/10.31098/ijeass.v3i2.1818>
- Franke, G., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: A comparison of four procedures. *Internet Research*, 29(3), pp. 430–447.
- Gomes, S., Lopes, J. M., & Nogueira, S. (2023). Willingness to pay more for green products: A critical challenge for Gen Z. *Journal of Cleaner Production*, 390, 136092. <https://doi.org/10.1016/j.jclepro.2023.136092>
- Guo, C., Ramadhan, S. F., Clarita, & Hendijani, R. B. (2023). Sustainable packaging's effect on millennial green purchase decision in Indonesia. *Open Journal of Business and Management*, 11(4), pp. 1723–1744. <https://doi.org/10.4236/ojbm.2023.114097>
- Hahn, E. D., & Ang, S. H. (2017). From the editors: New directions in the reporting of statistical results in the Journal of World Business. *Journal of World Business*, 52(2), pp. 125–126.
- Hair, J. F., Risher, J., Sarstedt, M., & Ringle, C. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), pp. 2–24.
- Hair, J. F., Thomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling* (2nd ed.). Thousand Oakes, CA: Sage.
- Henseler, J., Ringle, C., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), pp. 115–135.
- Jaiswal, D., & Kant, R. (2018). Green purchasing behaviour: A conceptual framework and empirical investigation of Indian consumers. *Journal of Retailing and Consumer Services*, 41, pp. 60–69. <https://doi.org/10.1016/j.jretconser.2017.11.008>
- Jia, Y., Nadeem, M., Hameed, I., Waris, I., & Akram, U. (2024). Towards sustainable consumption: Factors influencing energy-efficient appliance adoption in haze-affected environments. *Energy Strategy Reviews*, 53, 101416. <https://doi.org/10.1016/j.esr.2024.101416>
- Jindal, A. (2022). *Consumer awareness and perception towards sustainable packaging*. Indian Institute of Foreign Trade.
- Klein, P., & Popp, B. (2023). A comparison of the environmental sustainability of brick-and-mortar retailing and online retailing: Contrasting academic research and consumer perceptions. *Business and Society Review*, 128(4). <https://doi.org/10.1111/basr.12332>
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, 11(4), pp. 1–10.
- Kock, N., & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), pp. 546–580.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), pp. 607–610. <https://doi.org/10.1177/001316447003000308>
- Kuncoro, W., & Suriani, W. O. (2018). Achieving sustainable competitive advantage through product innovation and market driving. *Asia Pacific Management Review*, 23(3), pp. 186–192. <https://doi.org/10.1016/j.apmr.2017.07.006>
- Lai, N. Y. G., Wong, K. H., Zhu, F., Sun, T., Rivero, R., Li, Z., & Yu, L. J. (2022). Awareness and perception of the environmental sustainability of beverage packaging materials. *Lecture Notes in Mechanical Engineering*, 447–460. https://doi.org/10.1007/978-981-19-2890-1_43
- Lan, B. T. H., Phuong, T. T. L., Dat, T. T., & Truong, D. D. (2023). Factors affecting the purchase intention of products with environmentally friendly packaging of urban residents in Ho Chi Minh City, Vietnam. *Sustainability*, 15(9), 7726. <https://doi.org/10.3390/su15097726>
- Mahmoud, M. A., Tsetse, E. K. K., Tulasi, E. E., & Muddey, D. K. (2022). Green packaging, environmental awareness, willingness to pay and consumers' purchase decisions. *Sustainability*, 14(23), 16091. <https://doi.org/10.3390/su142316091>
- Meghanathan, N. (2016). Assortativity analysis of real-world network graphs based on centrality metrics. *Computer and Information Science*, 9(3), pp. 7–25. <http://doi.org/10.5539/cis.v9n3p7>
- Minton, E. A., Spielmann, N., Kahle, L. R., & Kim, C. H. (2018). The subjective norms of sustainable consumption: A cross-cultural exploration. *Journal of Business Research*, 82, pp. 400–408. <https://doi.org/10.1016/j.jbusres.2016.12.031>
- Moazzam, M., Ahmad, M., Hussain, A., & Akram, M. A. (2023). Examining the factors that shape green purchase behavior: The role of subjective norms, self-efficacy, attitude and intention. *Bulletin of Business and Economics (BBE)*, 12(3), pp. 221–232. <https://doi.org/10.61506/01.00027>
- Mokhtar, N. F., & Shamsuddin, M. S. (2024). E-commerce packaging waste in Malaysia- Where does it all end up?. *PaperASIA*, 40(4b), pp. 254–265. <https://doi.org/10.59953/paperasia.v40i4b.138>
- Mongula, A., Masnita, Y., & Kurniawati, K. (2023). Environmental concern: Does it drive green purchasing intention of sustainable packaging? *Jurnal Ekonomi Bisnis dan Kewirausahaan*, 12(3), pp. 290–308. <https://doi.org/10.26418/jebik.v12i3.67498>
- Moorthy, K., Kamarudin, A. A., Xin, L., Hui, L. M., Way, L. T., Fang, P. S., & Carmen, W. (2021). Green packaging purchase behavior: A study on Malaysian consumers. *Environment, Development and Sustainability*, 23, pp. 1–18. <https://doi.org/10.1007/s10668-021-01302-6>
- Munasinghe, P. M., & Shantha, A. A. (2021). Factors influencing the purchase intention of green packaging among millennials

- in Gampaha district of Sri Lanka. *Sri Lanka Journal of Marketing*, 7(1), pp. 117–148. <http://doi.org/10.4038/sljmuok.v7i1.59>
- Ng, C. H., Mistoh, M. A., Teo, S. H., Galassi, A., Ibrahim, A., Sipaut, C. S., Foo, J., Seay, J., Taufiq-Yap, Y. H., & Janaun, J. (2023). Plastic waste and microplastic issues in Southeast Asia. *Frontiers in Environmental Science*, 11, 1142071. <https://doi.org/10.3389/fenvs.2023.1142071>
- Ng, H.-X., Goh, Y.-N., & Lim, C.-N. (2024). Investigating factors influencing consumer intention to use online streaming services. *Malaysian Journal of Consumer and Family Economics*, 32(1), pp. 196–225. <https://doi.org/10.60016/majcafe.v32.08>
- Norton, V., Waters, C., Oloyede, O. O., & Lignou, S. (2022). Exploring consumers' understanding and perception of sustainable food packaging in the UK. *Foods*, 11(21), 3424. <https://doi.org/10.3390/foods11213424>
- Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*, 29, pp. 123–134. <https://doi.org/10.1016/j.jretconser.2015.11.006>
- Prakash, G., & Pathak, P. (2017). Intention to buy eco-friendly packaged products among young consumers of India: A study on developing nation. *Journal of Cleaner Production*, 141, pp. 385–393. <https://doi.org/10.1016/j.jclepro.2016.09.116>
- Rajendran, S. D., Wahab, S. N., & Singh, M. K. P. (2019). Malaysian consumers' preference for green packaging. *International Journal of Society Systems Science*, 11(4), 312. <https://doi.org/10.1504/ijsss.2019.103629>
- Ramayah, T., Cheah, J., Chuah, F., Ting, H., & Memon, M. A. (2018). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using Smartpls 3.0: An Updated Guide And Practical Guide To Statistical Analysis* (2nd ed.). Pearson.
- Rao, P., Balasubramanian, S., Vihari, N., Jabeen, S., Shukla, V., & Chanchaichujit, J. (2021). The e-commerce supply chain and environmental sustainability: An empirical investigation on the online retail sector. *Cogent Business & Management*, 8(1), 1938377. <https://doi.org/10.1080/23311975.2021.1938377>
- Ringle, C. M., Wende, S., & Becker, J.-M. (2015). *SmartPLS 3*. SmartPLS GmbH. <http://www.smartpls.com>
- Risher, J. J., Harrison, D. E., & LeMay, S. A. (2020). Last mile non-delivery: Consumer investment in last mile infrastructure. *Journal of Marketing Theory and Practice*, 28(4), pp. 1–13. <https://doi.org/10.1080/10696679.2020.1787846>
- Rocha, P. M. P. D. (2021). *Sustainable Packaging: Factors Influencing Consumers Purchase Intention* (Publication No. 31172936) [Master's thesis, Iscte - Instituto Universitário de Lisboa].
- Shafiquzzaman, M., Haider, H., AlSaleem, S. S., Ghumman, A. R., & Sadiq, R. (2018). Development of consumer perception index for assessing greywater reuse potential in arid environments. *Water SA*, 44(4), pp. 771–781. <https://doi.org/10.4314/wsa.v44i4.25>
- Shmueli, G., Ray, S., Velasquez Estrada, J. M., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research*, 69(10), pp. 4552–4564.
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J. H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), pp. 2322–2347.
- Si, W., Jiang, C., & Meng, L. (2022). The relationship between environmental awareness, habitat quality, and community residents' pro-environmental behavior—mediated effects model analysis based on social capital. *International Journal of Environmental Research and Public Health*, 19(20), 13253. <https://doi.org/10.3390/ijerph192013253>
- Siddharta, A. (2024, August 26). *Number of users of e-commerce in Malaysia 2019-2029*. Statista. <https://www.statista.com/statistics/1351255/malaysia-number-of-e-commerce-users/>
- Thapliyal, D., Karale, M., Diwan, V., Kumra, S., Arya, R. K., & Verros, G. D. (2024). Current status of sustainable food packaging regulations: Global perspective. *Sustainability*, 16(13), 5554. <https://doi.org/10.3390/su16135554>
- Turku, D., & Tura, N. (2023). The dark side of sustainable packaging: Battling with sustainability tensions. *Sustainable Production and Consumption*, 40, pp. 412–421. <https://doi.org/10.1016/j.spc.2023.07.007>
- Xie, G., Huang, L., Apostolidis, C., Huang, Z., Cai, W., & Li, G. (2021). Assessing consumer preference for overpackaging solutions in e-commerce. *International Journal of Environmental Research and Public Health*, 18(15), 7951. <https://doi.org/10.3390/ijerph18157951>
- Xu, Y., Du, J., Khan, M. A. S., Jin, S., Altaf, M., Anwar, F., & Sharif, I. (2022). Effects of subjective norms and environmental mechanism on green purchase behavior: An extended model of theory of planned behavior. *Frontiers in Environmental Science*, 10, 779629. <https://doi.org/10.3389/fenvs.2022.779629>
- Zamfirache, A., Nicoleta Andreea Neacșu, Madar, A., Bălășescu, S., Marius Bălășescu, & Ioana-Mădălina Purcaru. (2024). Behavioral differences and purchasing experiences through online commerce or offline within mall-based retail structures. *Electronic Commerce Research*. <https://doi.org/10.1007/s10660-024-09879-6>
- Zhao, X., Fan, L., & Xu, Y. (2024). An investigation of determinants of green consumption behavior: An extended theory of planned behavior. *Innovation and Green Development*, 4(1), 100198. <https://doi.org/10.1016/j.igd.2024.100198>

Dr Yee Jing Foo is a lecturer in the Department of Logistics Management at UCSI University. He holds a PhD in Technology, Operations and Logistics Management, along with a Master of Science and a Bachelor's degree. His research focuses on supply chain sustainability, digital technologies in supply chain and logistics, and the circular economy.

Dr Soo Xin Lin is a lecturer at the Faculty of Business and Management at UCSI University. She obtained her PhD and Master of Science in Economics, as well as a Bachelor's degree in International Economics. Her research specializes in international and financial economics, contributing to the body of knowledge in these domains through her academic publications.

Dr Leow Hon Wei serves as the Head of Programme for the Foundation in Arts at UCSI University. He earned his PhD in Applied Finance from the University of Malaya and holds both an MBA and a Bachelor of Business Administration from Universiti Kebangsaan Malaysia. With a strong focus on applied finance and investment, Dr. Leow has published research in reputable journals and maintains active profiles in financial industry