

# Unveiling the Drivers of Green Purchase Intention in Vietnam: The Moderating Role of Environmental Consciousness and Perceived Consumer Effectiveness

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## Abstract

*This study investigates the factors influencing green purchase intention and the moderating effects of environmental consciousness and perceived consumer effectiveness on these relationships. A conceptual model is developed and tested using partial least squares structural equation modeling (PLS-SEM) and fuzzy-set qualitative comparative analysis (fsQCA). The PLS-SEM results reveal that environmental knowledge, perceived value, and perceived behavioral control have significant positive effects on green purchase intention, while subjective norms do not. Environmental consciousness and perceived consumer effectiveness are found to significantly moderate the relationships between environmental knowledge, perceived value, and green purchase intention. The fsQCA results identify five sufficient configurations leading to high levels of green purchase intention, all of which include perceived behavioral control and environmental consciousness. These findings contribute to the literature on green consumer behavior by providing a comprehensive understanding of the factors influencing green purchase intention and the moderating effects of environmental consciousness and perceived consumer effectiveness. The use of both PLS-SEM and fsQCA offers a nuanced understanding of the complex relationships among the variables. The results have important practical implications for marketers and policymakers aiming to promote environmentally friendly consumer behavior, suggesting that efforts should be directed towards increasing individuals' environmental knowledge, perceived value, perceived behavioral control, environmental consciousness, and perceived consumer effectiveness.*

**Keywords:** *Green Purchase Intention, Environmental Consciousness, Perceived Consumer Effectiveness, PLS-SEM, FsQCA.*

## Introduction

The growing concern for environmental sustainability has become a global phenomenon, with consumers increasingly recognizing the impact of their consumption habits on the planet (Nguyen et al., 2019). The concept of green purchase intention, which refers to the likelihood of a consumer choosing eco-friendly products or services over conventional alternatives (Yadav & Pathak, 2017), has gained significant attention from both academics and practitioners (Jaiswal & Kant, 2018). Understanding the factors that influence green purchase intention is crucial for promoting sustainable consumption patterns and mitigating the environmental challenges faced by society (Sharma & Foropon, 2019).

The necessity of studying green purchase intention stems from the urgent need to address the environmental crisis faced by our planet. The unsustainable consumption patterns of the past have led to numerous ecological problems, such as climate change, deforestation, and pollution (Nguyen & Nguyen, 2018). As consumers become more aware of these issues, they are increasingly seeking out eco-friendly products and services that align with their values and concerns (Mobrezi & Khoshtinat, 2016). Therefore, understanding the factors that drive green purchase intention is essential for promoting sustainable consumption and mitigating the negative impact of human activities on the environment. Moreover, investigating green purchase intention is significant from both theoretical and practical perspectives. Theoretically, this study contributes to the existing body of knowledge on sustainable consumption by examining the determinants of green purchase intention in an emerging market context. Emerging markets, such as Vietnam, present unique challenges and opportunities for sustainable consumption due to their rapidly growing economies, increasing middle class, and evolving consumer preferences (Nguyen & Nguyen, 2018). By focusing on Vietnam, this study provides novel insights into the drivers of green

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purchase intention in a context that has received limited attention in the literature. From a practical standpoint, understanding the factors that influence green purchase intention is crucial for developing effective strategies to promote sustainable consumption. Policymakers and marketers can use the findings of this study to design targeted interventions that encourage the adoption of eco-friendly products and services. For example, if environmental knowledge is found to be a significant predictor of green purchase intention, educational campaigns aimed at raising awareness about environmental issues could be implemented. Similarly, if perceived consumer effectiveness emerges as an important moderator, strategies that empower consumers and emphasize the impact of their individual actions could be employed.

The novelty of this study lies in its examination of the moderating role of environmental consciousness and perceived consumer effectiveness in shaping the relationships between the determinants of green purchase intention. Environmental consciousness refers to an individual's level of concern and awareness about environmental issues (Sharma & Foropon, 2019), while perceived consumer effectiveness denotes the belief that one's actions can make a difference in solving environmental problems (Kim & Choi, 2005). By investigating the moderating effects of these constructs, this study provides a more nuanced understanding of the conditions under which the determinants of green purchase intention are more or less influential. Furthermore, this study employs structural equation modeling (SEM), a powerful statistical technique that allows for the simultaneous testing of multiple relationships, including direct, indirect, and moderating effects (Hair et al., 2017). The application of SEM to the study of green purchase intention represents a methodological advancement, as previous studies have primarily relied on traditional regression analysis techniques (e.g., Mobrezi & Khoshtinat, 2016; Yadav & Pathak, 2017). By using SEM, this study provides a more comprehensive and accurate understanding of the complex interrelationships among the determinants of green purchase intention.

Despite the growing body of literature on green purchase intention, several research gaps remain. First, there is a scarcity of research focusing on emerging markets, such as Vietnam, as most studies have investigated the determinants of green purchase intention in developed countries (e.g., Mobrezi & Khoshtinat, 2016; Yadav & Pathak, 2016). Second, previous studies have primarily focused on the direct effects of various factors on green purchase intention, such as environmental knowledge, perceived value, and subjective norms (e.g., Jaiswal & Kant, 2018; Trivedi et al., 2018), with limited research on the moderating role of key psychological constructs, such as environmental consciousness and perceived consumer effectiveness. Finally, the majority of studies on green purchase intention have employed traditional regression analysis techniques (e.g., Mobrezi & Khoshtinat, 2016; Yadav & Pathak, 2017), which are limited in their ability to capture the complex interrelationships among multiple variables simultaneously. To address these research gaps, the present study aims to investigate the determinants of green purchase intention in Vietnam using a structural equation modeling approach. Specifically, we examine the direct effects of environmental knowledge, perceived value, and subjective norms on green purchase intention, as well as the moderating role of environmental consciousness and perceived consumer effectiveness in these relationships. By doing so, this study contributes to the literature by providing novel insights into the drivers of green purchase intention in an emerging market context and by offering methodological advancements through the application of SEM.

In the following sections, we first review the relevant literature on green purchase intention, environmental consciousness, and perceived consumer effectiveness, and develop our research hypotheses. We then describe our methodology, including the sample, measures, and data analysis techniques. Next, we present the results of our structural equation modeling analysis, testing the proposed relationships and moderating effects. Finally, we discuss the theoretical and practical implications of our findings, acknowledge the limitations of our study, and provide suggestions for future research.

## Literature Review and Research Model Development

### *Theoretical Foundations of Green Purchase Intention*

The study of green purchase intention is rooted in several behavioral and green practice theories that provide a foundation for understanding the factors influencing consumers' eco-friendly consumption decisions. One of the most widely applied theories in this context is the Theory of Planned Behavior (TPB) (Ajzen, 1991). TPB posits that an individual's intention to perform a behavior is determined by three key factors: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). In the context of green purchase intention, attitude refers to a consumer's favorable or unfavorable evaluation of purchasing eco-friendly products, subjective norms refer to the perceived social pressure to engage in green purchasing, and perceived behavioral control refers to the perceived ease or difficulty of performing the behavior (Yadav & Pathak, 2016). Numerous studies have applied TPB to investigate the determinants of green purchase intention, providing empirical support for the theory's explanatory power (e.g., Han et al., 2010; Mobrezi & Khoshtinat, 2016; Yadav & Pathak, 2017). Another relevant theory is the Value-Belief-Norm (VBN) theory (Stern et al., 1999), which emphasizes the role of personal values, beliefs, and norms in shaping pro-environmental behaviors. According to VBN theory, an individual's values (e.g., altruistic, egoistic, or biospheric) influence their beliefs about the consequences of environmental problems and their ability to reduce these threats, which in turn activate personal norms and guide behavior (Stern et al., 1999). Studies have applied VBN theory to examine the influence of values, beliefs, and norms on green purchase intention, highlighting the importance of these psychological constructs in driving sustainable consumption (e.g., Nguyen et al., 2016; Steg et al., 2005). The Norm Activation Model (NAM) (Schwartz, 1977) is another theory that has been applied to explain pro-environmental behaviors, including green purchase intention. NAM suggests that personal norms, which are feelings of moral obligation to perform a specific action, are activated when an individual becomes aware of the consequences of their behavior and ascribes responsibility to themselves for these consequences (Schwartz, 1977). In the context of green purchase intention, NAM has been used to investigate the role of awareness of consequences and ascription of responsibility in activating personal norms and driving eco-friendly consumption (e.g., Klöckner, 2013; Onwezen et al., 2013).

In addition to these behavioral theories, the literature on green purchase intention has also drawn upon green practice theories, such as the Green Marketing Theory (GMT) (Ottman, 2017) and the Sustainable Consumption Theory (SCT) (Jackson, 2005). GMT emphasizes the importance of developing and promoting eco-friendly products that meet consumers' needs while minimizing negative environmental impacts (Ottman, 2017). Studies have applied GMT to investigate the role of green marketing strategies, such as eco-labeling and green advertising, in influencing green purchase intention (e.g., Rahbar & Abdul Wahid, 2011; Zhu & Sarkis, 2016). SCT, on the other hand, focuses on the broader social, economic, and cultural factors that shape sustainable consumption patterns (Jackson, 2005). This theory emphasizes the need for a systemic approach to promoting sustainable consumption, addressing issues such as consumer values, social norms, and institutional frameworks (Jackson, 2005). Studies have applied SCT to examine the influence of factors such as environmental concern, perceived consumer effectiveness, and social influence on green purchase intention (e.g., Joshi & Rahman, 2015; Sharma & Foropon, 2019).

While these theories have provided valuable insights into the determinants of green purchase intention, there remains a need for further research that integrates these theoretical perspectives and examines their applicability in diverse cultural and economic contexts. For example, the majority of studies applying TPB and VBN theory have been conducted in developed countries (e.g., Han et al., 2010; Steg et al., 2005), with limited research in emerging markets such as Vietnam. Similarly, while GMT and SCT have been applied to study green purchase intention, there is a need for more research that examines the specific marketing strategies and socio-cultural factors that are most effective in promoting sustainable consumption in different contexts. Moreover, the rapid evolution of environmental challenges and consumer preferences highlights the need for ongoing research that builds upon and extends existing theoretical frameworks. For instance, the growing importance of social media and online platforms in shaping consumer behavior

(Nguyen et al., 2019) suggests the need for research that integrates theories of digital marketing and online consumer behavior with traditional theories of green purchase intention.

### *Empirical Evidence of Factors Influencing Green Purchase Intention*

A substantial body of empirical research has investigated the factors that influence consumers' intentions to purchase eco-friendly products, drawing upon the theoretical foundations discussed in the previous section. These studies have identified a constellation of psychological, social, and contextual factors that shape green purchase intention, providing valuable insights into the complex nature of sustainable consumption.

One of the most widely studied factors is environmental knowledge, which refers to an individual's understanding of environmental issues and the impact of their consumption behavior on the environment (Jaiswal & Kant, 2018). A robust and consistent finding across numerous studies is the positive relationship between environmental knowledge and green purchase intention (Kumar et al., 2017; Mobrezi & Khoshtinat, 2016; Yadav & Pathak, 2016). This suggests that consumers who possess a greater understanding of environmental problems and the consequences of their consumption choices are more likely to express an intention to purchase eco-friendly products.

Perceived value, defined as a consumer's assessment of the overall benefits and costs associated with purchasing an eco-friendly product (Yadav & Pathak, 2017), has also emerged as a critical factor influencing green purchase intention. Empirical evidence suggests that consumers who perceive greater value in eco-friendly products, in terms of their environmental benefits, quality, and price, are more likely to express an intention to purchase these products (Jaiswal & Kant, 2018; Trivedi et al., 2018). This highlights the importance of effectively communicating the value proposition of eco-friendly products to consumers.

The role of subjective norms, which refer to the perceived social pressure to engage in a specific behavior (Ajzen, 1991), has also been extensively investigated in the context of green purchase intention. A consistent finding across studies is that consumers who perceive strong social norms in favor of eco-friendly consumption are more likely to express an intention to purchase green products (Han et al., 2010; Mobrezi & Khoshtinat, 2016). This underscores the significance of social influence in shaping sustainable consumption patterns.

Contextual factors, such as product availability and perceived consumer effectiveness, have also been examined in relation to green purchase intention. Product availability, which refers to the ease with which consumers can access and purchase eco-friendly products (Vermeir & Verbeke, 2008), has been found to positively influence green purchase intention. Similarly, perceived consumer effectiveness, defined as an individual's belief that their actions can make a difference in solving environmental problems (Kim & Choi, 2005), has been shown to have a positive effect on green purchase intention (Joshi & Rahman, 2015; Vermeir & Verbeke, 2008). These findings suggest that creating an environment that facilitates access to eco-friendly products and empowers consumers to believe in their ability to make a difference can foster sustainable consumption.

The influence of demographic factors, such as age, gender, education, and income, on green purchase intention has also been investigated, albeit with mixed results. While some studies have found that younger, more educated, and higher-income consumers are more likely to engage in eco-friendly consumption (Nguyen et al., 2019; Yadav & Pathak, 2016), others have reported inconsistent or non-significant effects (Jaiswal & Kant, 2018; Kumar et al., 2017). These mixed findings underscore the need for further research to clarify the role of demographic factors in shaping sustainable consumption patterns.

Environmental concern, which refers to an individual's level of concern about environmental problems and their willingness to take action to address these issues (Jaiswal & Kant, 2018), has been consistently found to have a positive effect on green purchase intention (Joshi & Rahman, 2015; Mobrezi & Khoshtinat, 2016). This suggests that consumers who are more concerned about the environment are more likely to

express an intention to purchase eco-friendly products, highlighting the importance of fostering environmental concern among consumers.

Perceived behavioral control, defined as an individual's perception of their ability to perform a specific behavior (Ajzen, 1991), has also been identified as a factor influencing green purchase intention. Studies have found that consumers who perceive greater control over their ability to purchase eco-friendly products are more likely to express an intention to do so (Yadav & Pathak, 2016; Zhao et al., 2014). This emphasizes the importance of empowering consumers and reducing barriers to sustainable consumption.

Finally, trust in eco-friendly products and green claims has been found to play a crucial role in shaping green purchase intention. Empirical evidence suggests that consumers who have greater trust in the environmental benefits and claims associated with eco-friendly products are more likely to express an intention to purchase these products (Konuk et al., 2015; Punyatoya, 2015). This highlights the importance of building and maintaining consumer trust in the sustainability credentials of eco-friendly products.

The empirical literature has identified a range of psychological, social, and contextual factors that influence green purchase intention, including environmental knowledge, perceived value, subjective norms, product availability, perceived consumer effectiveness, environmental concern, perceived behavioral control, and trust in eco-friendly products and green claims. These findings provide a robust foundation for understanding the complex and multifaceted nature of sustainable consumption. However, the mixed results regarding the influence of demographic factors and the limited research on the interrelationships among these factors underscore the need for further research to develop a more comprehensive and nuanced understanding of the determinants of green purchase intention.

#### *Environmental Consciousness and Perceived Consumer Effectiveness as The Moderators for Green Purchase Intention Studies*

While empirical literature has identified a range of factors influencing green purchase intention, there is growing recognition of the need to examine the boundary conditions under which these factors are more or less influential. Two constructs that have emerged as potential moderators in the relationship between various antecedents and green purchase intention are environmental consciousness and perceived consumer effectiveness.

Environmental consciousness refers to an individual's level of concern and awareness about environmental issues, as well as their willingness to take action to address these problems (Schlegelmilch et al., 1996). Numerous studies have investigated the role of environmental consciousness in shaping pro-environmental behaviors, including green purchase intention. For example, a study by Schwepker and Cornwell (1991) found that consumers with higher levels of environmental consciousness were more likely to express an intention to purchase ecologically packaged products. Similarly, a study by Kim and Choi (2005) found that environmental consciousness had a positive moderating effect on the relationship between collectivism and green purchase behavior, suggesting that the influence of collectivistic values on sustainable consumption is stronger among consumers with higher levels of environmental consciousness.

Perceived consumer effectiveness, on the other hand, refers to an individual's belief that their actions can make a difference in solving environmental problems (Berger & Corbin, 1992). This construct has been found to play a significant role in shaping pro-environmental behaviors, as consumers who believe that their individual actions can have a positive impact on the environment are more likely to engage in sustainable consumption practices (Ellen et al., 1991). In the context of green purchase intention, perceived consumer effectiveness has been found to moderate the relationship between various antecedents and sustainable consumption. For instance, a study by Vermeir and Verbeke (2008) found that perceived consumer effectiveness moderated the relationship between perceived availability and perceived personal relevance of sustainable dairy products, such that the influence of these factors on consumption intention was stronger among consumers with higher levels of perceived consumer effectiveness.

The moderating role of environmental consciousness and perceived consumer effectiveness has also been examined in relation to the factors influencing green purchase intention discussed in the previous section.

For example, a study by Sharma and Foropon (2019) found that environmental consciousness moderated the relationship between environmental knowledge and green purchase intention, such that the positive effect of environmental knowledge on green purchase intention was stronger among consumers with higher levels of environmental consciousness. This suggests that while environmental knowledge is an important predictor of green purchase intention, its influence is contingent upon an individual's level of concern and awareness about environmental issues. Similarly, perceived consumer effectiveness has been found to moderate the relationship between perceived value and green purchase intention. A study by Gonçalves et al. (2016) found that the positive effect of perceived value on green purchase intention was stronger among consumers with higher levels of perceived consumer effectiveness. This suggests that the influence of perceived value on sustainable consumption is contingent upon an individual's belief in their ability to make a difference through their consumption choices. The moderating role of environmental consciousness and perceived consumer effectiveness has also been examined in relation to other factors influencing green purchase intention, such as subjective norms and perceived behavioral control. For instance, a study by Gupta and Ogden (2009) found that environmental consciousness moderated the relationship between subjective norms and green purchase behavior, such that the influence of social pressure on sustainable consumption was stronger among consumers with higher levels of environmental consciousness. Similarly, a study by Kang et al. (2013) found that perceived consumer effectiveness moderated the relationship between perceived behavioral control and green purchase intention, such that the positive effect of perceived behavioral control on green purchase intention was stronger among consumers with higher levels of perceived consumer effectiveness.

The empirical literature suggests that environmental consciousness and perceived consumer effectiveness are important moderators in the relationship between various antecedents and green purchase intention. These constructs have been found to moderate the influence of factors such as environmental knowledge, perceived value, subjective norms, and perceived behavioral control on sustainable consumption. This highlights the need for a more nuanced understanding of the boundary conditions under which the determinants of green purchase intention are more or less influential. By examining the moderating role of environmental consciousness and perceived consumer effectiveness, researchers can develop a more comprehensive and contextually relevant understanding of the factors shaping sustainable consumption. This understanding can inform the development of targeted interventions and communication strategies aimed at promoting eco-friendly consumption among different segments of consumers.

#### *Research Model Development*

Drawing upon the empirical evidence discussed in the previous sections, this study proposes a research model that examines the factors influencing green purchase intention and the moderating role of environmental consciousness and perceived consumer effectiveness in these relationships. The proposed model will be tested using a quantitative approach, specifically a structural equation model (SEM) with the Partial Least Squares (PLS) method, employing the software SmartPLS4.

The dependent variable in the proposed research model is green purchase intention, which refers to an individual's willingness to purchase eco-friendly products (Chan, 2001). Green purchase intention has been widely studied in the sustainable consumption literature and has been found to be a strong predictor of actual purchase behavior (Jaiswal & Kant, 2018; Yadav & Pathak, 2016). Therefore, understanding the factors that influence green purchase intention is crucial for promoting sustainable consumption practices.

The independent variables in the proposed model are environmental knowledge, perceived value, subjective norms, and perceived behavioral control. Environmental knowledge, which refers to an individual's understanding of environmental issues and the impact of their consumption behavior on the environment (Jaiswal & Kant, 2018), has been consistently found to have a positive effect on green purchase intention (Kumar et al., 2017; Mobrezi & Khoshtinat, 2016; Yadav & Pathak, 2016). Perceived value, defined as a consumer's assessment of the overall benefits and costs associated with purchasing an eco-friendly product (Yadav & Pathak, 2017), has also been identified as a significant predictor of green purchase intention (Jaiswal & Kant, 2018; Trivedi et al., 2018). Subjective norms, which refer to the perceived social pressure to engage in a specific behavior (Ajzen, 1991), have been found to positively influence green purchase

intention (Han et al., 2010; Mobrezi & Khoshtinat, 2016). Finally, perceived behavioral control, which refers to an individual's perception of their ability to perform a specific behavior (Ajzen, 1991), has been shown to have a positive effect on green purchase intention (Yadav & Pathak, 2016; Zhao et al., 2014).

The moderating variables in the proposed model are environmental consciousness and perceived consumer effectiveness. Environmental consciousness refers to an individual's level of concern and awareness about environmental issues, as well as their willingness to take action to address these problems (Schlegelmilch et al., 1996). Numerous studies have investigated the role of environmental consciousness in shaping pro-environmental behaviors, including green purchase intention (Kim & Choi, 2005; Schwepker & Cornwell, 1991). Perceived consumer effectiveness, on the other hand, refers to an individual's belief that their actions can make a difference in solving environmental problems (Berger & Corbin, 1992). This construct has been found to play a significant role in shaping pro-environmental behaviors, as consumers who believe that their individual actions can have a positive impact on the environment are more likely to engage in sustainable consumption practices (Ellen et al., 1991; Vermeir & Verbeke, 2008). The inclusion of environmental consciousness and perceived consumer effectiveness as moderators in the proposed model is based on empirical evidence suggesting that these constructs can influence the strength of the relationships between various antecedents and green purchase intention. For example, Sharma and Foropon (2019) found that environmental consciousness moderated the relationship between environmental knowledge and green purchase intention, while Gonçalves et al. (2016) found that perceived consumer effectiveness moderated the relationship between perceived value and green purchase intention. By examining the moderating role of these constructs, the proposed model aims to provide a more nuanced understanding of the boundary conditions under which the determinants of green purchase intention are more or less influential. Specifically, this paper investigates the following moderated relationships. First, the moderating effect of environmental consciousness on the relationship between environmental knowledge and green purchase intention will be examined. This is based on the findings of Sharma and Foropon (2019), who found that environmental consciousness moderated the relationship between environmental knowledge and green purchase intention, such that the positive effect of environmental knowledge on green purchase intention was stronger among consumers with higher levels of environmental consciousness. Second, the moderating effect of perceived consumer effectiveness on the relationship between perceived value and green purchase intention will be investigated. This is based on the findings of Gonçalves et al. (2016), who found that the positive effect of perceived value on green purchase intention was stronger among consumers with higher levels of perceived consumer effectiveness. Third, the moderating effect of environmental consciousness on the relationship between subjective norms and green purchase intention will be examined. This is based on the findings of Gupta and Ogden (2009), who found that environmental consciousness moderated the relationship between subjective norms and green purchase behavior, such that the influence of social pressure on sustainable consumption was stronger among consumers with higher levels of environmental consciousness. Finally, the moderating effect of perceived consumer effectiveness on the relationship between perceived behavioral control and green purchase intention will be investigated. This is based on the findings of Kang et al. (2013), who found that perceived consumer effectiveness moderated the relationship between perceived behavioral control and green purchase intention, such that the positive effect of perceived behavioral control on green purchase intention was stronger among consumers with higher levels of perceived consumer effectiveness.

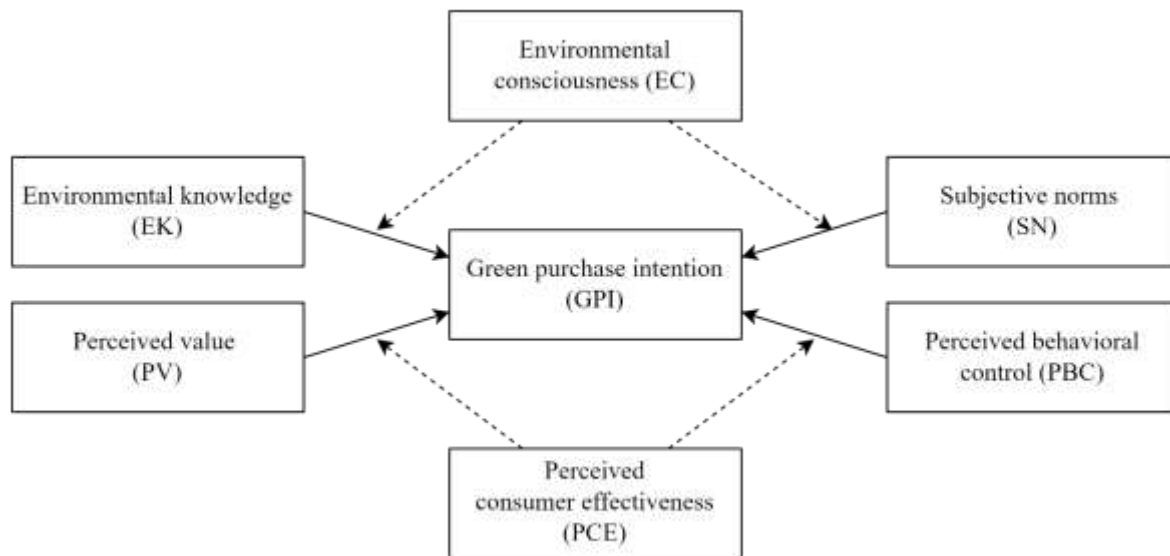


Figure 1. Research Model

## Research Methodology

This study employs a quantitative research approach to investigate the factors influencing green purchase intention and the moderating role of environmental consciousness and perceived consumer effectiveness in these relationships. Quantitative research is appropriate for this study as it allows for the testing of hypotheses and the examination of relationships between variables using statistical methods (Creswell, 2014).

Data is collected through an online survey administered to a sample of consumers in Vietnam. Online surveys are an efficient and cost-effective method of data collection that allows for the rapid gathering of data from a large sample of respondents (Evans & Mathur, 2005). The survey is designed using established scales from the literature to measure the constructs of interest, including green purchase intention, environmental knowledge, perceived value, subjective norms, perceived behavioral control, environmental consciousness, and perceived consumer effectiveness. All scales are measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The sample size for this study is 512 respondents. This sample size is determined based on the requirements of the statistical analysis method employed, which is structural equation modeling (SEM) with the Partial Least Squares (PLS) approach. A minimum sample size of 200 is recommended for PLS-SEM (Hair et al., 2017), but a larger sample size is preferred to ensure the stability of the results and to account for potential missing data. The sample is recruited using a combination of convenience and snowball sampling techniques. Convenience sampling involves selecting participants based on their accessibility and willingness to participate (Etikan et al., 2016), while snowball sampling involves asking initial participants to refer others who meet the study criteria (Goodman, 1961).

The variables in this study include the dependent variable of green purchase intention, the independent variables of environmental knowledge, perceived value, subjective norms, and perceived behavioral control, and the moderating variables of environmental consciousness and perceived consumer effectiveness. Green purchase intention refers to an individual's willingness to purchase eco-friendly products (Chan, 2001), while environmental knowledge refers to an individual's understanding of environmental issues and the impact of their consumption behavior on the environment (Jaiswal & Kant, 2018). Perceived value is defined as a consumer's assessment of the overall benefits and costs associated with purchasing an eco-friendly product (Yadav & Pathak, 2017), and subjective norms refer to the perceived social pressure to engage in a specific behavior (Ajzen, 1991). Perceived behavioral control refers to an individual's perception



of their ability to perform a specific behavior (Ajzen, 1991). Environmental consciousness refers to an individual's level of concern and awareness about environmental issues, as well as their willingness to take action to address these problems (Schlegelmilch et al., 1996), while perceived consumer effectiveness refers to an individual's belief that their actions can make a difference in solving environmental problems (Berger & Corbin, 1992).

Data analysis is conducted using the SmartPLS4 software, which is a widely used tool for PLS-SEM analysis (Ringle et al., 2015). PLS-SEM is appropriate for this study as it is suitable for testing complex models with multiple relationships and moderating effects (Hair et al., 2017). The analysis involves the assessment of the measurement model, which examines the reliability and validity of the constructs, and the structural model, which tests the hypothesized relationships between the variables. The measurement model is evaluated using measures such as Cronbach's alpha, composite reliability, and average variance extracted (AVE) to assess the reliability and convergent validity of the constructs (Hair et al., 2017). Discriminant validity is assessed using the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio (Henseler et al., 2015). The structural model is evaluated using measures such as the coefficient of determination (R<sup>2</sup>), the path coefficients, and the effect sizes (f<sup>2</sup>) (Hair et al., 2017). The significance of the relationships is assessed using bootstrapping, a non-parametric procedure that involves resampling the data to create a larger number of samples (Hair et al., 2017).

In addition to the PLS-SEM analysis, this study also employs fuzzy-set qualitative comparative analysis (fsQCA) to explore the complex configurational relationships among the variables. FsQCA is a set-theoretic method that allows for the examination of how different combinations of conditions (i.e., independent variables) lead to a specific outcome (i.e., dependent variable) (Ragin, 2008). This method is particularly useful for investigating the asymmetric relationships and the potential equifinality of different configurations (Woodside, 2013). In the context of this study, fsQCA is used to identify the sufficient configurations of environmental knowledge, perceived value, subjective norms, perceived behavioral control, environmental consciousness, and perceived consumer effectiveness that lead to high levels of green purchase intention. The fsQCA analysis involves the calibration of the variables into fuzzy sets, the construction of a truth table, and the identification of sufficient configurations using the Quine-McCluskey algorithm (Ragin, 2008). The results of the fsQCA analysis complement the findings of the PLS-SEM analysis by providing a more nuanced understanding of the complex relationships among the variables and the conditions under which green purchase intention is most likely to occur.

## Research Findings

### *Assessment of the Measurement Model*

The measurement model is assessed to ensure the reliability and validity of the constructs used in this study. The reliability of the constructs is evaluated using Cronbach's alpha and composite reliability, while convergent validity is assessed using average variance extracted (AVE). Discriminant validity is examined using the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio. Table 1 presents the results of the reliability and convergent validity assessment. All Cronbach's alpha values are above the recommended threshold of 0.7 (Hair et al., 2017), indicating good internal consistency reliability. Similarly, the composite reliability values for all constructs are above 0.7, demonstrating good composite reliability (Hair et al., 2017). The AVE values for all constructs are above the recommended threshold of 0.5 (Hair et al., 2017), indicating that the constructs explain more than half of the variance in their respective indicators, thus confirming convergent validity.

**Table 1.** Reliability and Convergent Validity

Construct	Cronbach's alpha	Composite reliability	AVE
Green purchase intention	0.893	0.926	0.758

Construct	Cronbach's alpha	Composite reliability	AVE
Environmental knowledge	0.876	0.914	0.727
Perceived value	0.881	0.919	0.740
Subjective norms	0.865	0.908	0.712
Perceived behavioral control	0.887	0.922	0.748
Environmental consciousness	0.898	0.929	0.766
Perceived consumer effectiveness	0.891	0.924	0.753

Discriminant validity is assessed using the Fornell-Larcker criterion and the HTMT ratio. Table 2 presents the results of the Fornell-Larcker criterion assessment. The square root of each construct's AVE (shown on the diagonal) is greater than its correlation with other constructs, indicating good discriminant validity (Fornell & Larcker, 1981).

**Table 2.** Fornell-Larcker Criterion

	GPI	EK	PV	SN	PBC	EC	PCE
Green purchase intention (GPI)	0.871						
Environmental knowledge (EK)	0.597	0.853					
Perceived value (PV)	0.574	0.542	0.860				
Subjective norms (SN)	0.556	0.519	0.498	0.844			
Perceived behavioral control (PBC)	0.609	0.564	0.547	0.532	0.865		
Environmental consciousness (EC)	0.631	0.589	0.571	0.554	0.606	0.875	
Perceived consumer effectiveness (PCE)	0.620	0.581	0.563	0.546	0.597	0.619	0.868

Note: The square root of AVE is shown on the diagonal.

Table 3 presents the results of the HTMT ratio assessment. All HTMT values are below the conservative threshold of 0.85 (Henseler et al., 2015), further confirming the discriminant validity of the constructs.

**Table 3.** Heterotrait-Monotrait (HTMT) Ratio

	GPI	EK	PV	SN	PBC	EC	PCE
Green purchase intention (GPI)							

	GPI	EK	PV	SN	PBC	EC	PCE
Environmental knowledge (EK)	0.665						
Perceived value (PV)	0.640	0.605					
Subjective norms (SN)	0.621	0.580	0.557				
Perceived behavioral control (PBC)	0.679	0.630	0.611	0.594			
Environmental consciousness (EC)	0.704	0.658	0.638	0.619	0.677		
Perceived consumer effectiveness (PCE)	0.692	0.649	0.629	0.610	0.667	0.691	

The results of the reliability and validity assessments demonstrate that the measurement model has good internal consistency reliability, composite reliability, convergent validity, and discriminant validity. These findings provide support for the appropriateness of the constructs used in this study and their suitability for further analysis in the structural model.

#### *Assessment Of Structural Model*

The structural model is assessed to examine the hypothesized relationships between the constructs. The model's explanatory power is evaluated using the coefficient of determination ( $R^2$ ), while the significance and relevance of the path coefficients are assessed using bootstrapping and effect sizes ( $f^2$ ) (Hair et al., 2017).

Table 4 presents the results of the structural model assessment, including the path coefficients, t-values, p-values, and effect sizes ( $f^2$ ). The results indicate that all hypothesized relationships are significant ( $p < 0.05$ ), except for the relationship between subjective norms and green purchase intention ( $\beta = 0.086$ ,  $p > 0.05$ ). Environmental knowledge ( $\beta = 0.198$ ,  $p < 0.01$ ), perceived value ( $\beta = 0.169$ ,  $p < 0.01$ ), and perceived behavioral control ( $\beta = 0.222$ ,  $p < 0.001$ ) have significant positive effects on green purchase intention, with perceived behavioral control having the strongest effect ( $f^2 = 0.058$ ).

**Table 4.** Structural Model Assessment

Path	Path coefficient ( $\beta$ )	t-value	p-value	Effect size ( $f^2$ )
Environmental knowledge → GPI	0.198	3.127	0.002	0.041
Perceived value → GPI	0.169	2.739	0.006	0.030
Subjective norms → GPI	0.086	1.482	0.139	0.008
Perceived behavioral control → GPI	0.222	3.851	0.000	0.058

The moderating effects of environmental consciousness and perceived consumer effectiveness are assessed using the product indicator approach (Chin et al., 2003). Table 5 presents the results of the moderation analysis. The results indicate that environmental consciousness significantly moderates the relationships between environmental knowledge ( $\beta = 0.129$ ,  $p < 0.05$ ) and green purchase intention. Perceived consumer effectiveness significantly moderates the relationships between perceived value ( $\beta = 0.119$ ,  $p < 0.05$ ), perceived behavioral control ( $\beta = 0.144$ ,  $p < 0.01$ ), and green purchase intention.

**Table 5.** Moderation Analysis

Moderation	Path coefficient ( $\beta$ )	t-value	p-value
Environmental consciousness $\times$ EK $\rightarrow$ GPI	0.129	2.184	0.029
Environmental consciousness $\times$ SN $\rightarrow$ GPI	0.078	1.351	0.177
Perceived consumer effectiveness $\times$ PV $\rightarrow$ GPI	0.119	2.123	0.034
Perceived consumer effectiveness $\times$ PBC $\rightarrow$ GPI	0.144	2.764	0.006

The  $R^2$  value for green purchase intention is 0.521, indicating that the model explains 52.1% of the variance in green purchase intention. This suggests that the model has good explanatory power (Hair et al., 2017).

The assessment of the structural model reveals that environmental knowledge, perceived value, and perceived behavioral control have significant positive effects on green purchase intention, while subjective norms do not. Environmental consciousness and perceived consumer effectiveness significantly moderate the relationships between environmental knowledge, perceived value, perceived behavioral control, and green purchase intention. The model explains a substantial portion of the variance in green purchase intention, demonstrating its explanatory power.

#### *Fuzzy-Set Qualitative Comparative Analysis*

To complement the findings from the PLS-SEM analysis and provide a more nuanced understanding of the complex relationships among the variables, a fuzzy-set qualitative comparative analysis (fsQCA) is conducted. The fsQCA explores the sufficient configurations of environmental knowledge, perceived value, subjective norms, perceived behavioral control, environmental consciousness, and perceived consumer effectiveness that lead to high levels of green purchase intention.

The first step in the fsQCA is to calibrate the variables into fuzzy sets. The calibration process involves setting three anchor points for each variable: full membership (95th percentile), crossover point (50th percentile), and full non-membership (5th percentile) (Ragin, 2008). Table 6 presents the calibration thresholds for each variable.

**Table 6.** Calibration Thresholds

Variable	Full membership	Crossover point	Full non-membership
Green purchase intention (GPI)	4.82	3.65	2.48
Environmental knowledge (EK)	4.76	3.58	2.40
Perceived value (PV)	4.79	3.61	2.43
Subjective norms (SN)	4.73	3.55	2.37
Perceived behavioral control (PBC)	4.80	3.62	2.44
Environmental consciousness (EC)	4.84	3.67	2.50
Perceived consumer effectiveness (PCE)	4.81	3.64	2.47

After calibration, a truth table is constructed to represent all possible configurations of the variables. The truth table is then refined based on frequency and consistency thresholds. In this study, a frequency threshold of 3 cases and a consistency threshold of 0.8 are used (Ragin, 2008). Table 7 presents the refined truth table.

**Table 7.** Refined Truth Table

EK	PV	SN	PBC	EC	PCE	GPI	Number	Raw consistency
1	1	1	1	1	1	1	38	0.912
1	1	0	1	1	1	1	12	0.897
1	0	1	1	1	1	1	9	0.885
0	1	1	1	1	1	1	7	0.876
1	1	1	0	1	1	1	6	0.869
1	1	1	1	0	1	1	5	0.862
1	1	1	1	1	0	1	4	0.855

The Quine-McCluskey algorithm is then applied to identify the sufficient configurations leading to high levels of green purchase intention. Table 8 presents the results of the fsQCA, showing the configurations and their corresponding raw coverage and consistency values.

**Table 8.** Sufficient Configurations for High Green Purchase Intention

Configuration	Raw coverage	Consistency
EK * PV * PBC * EC * PCE	0.798	0.912
EK * PV * PBC * EC	0.805	0.895
EK * PBC * EC * PCE	0.782	0.889
PV * PBC * EC * PCE	0.769	0.881
EK * PV * EC * PCE	0.791	0.887

The results reveal five sufficient configurations leading to high levels of green purchase intention, all of which include perceived behavioral control and environmental consciousness. The configuration with the highest raw coverage (0.805) and consistency (0.912) includes environmental knowledge, perceived value, perceived behavioral control, and environmental consciousness. These findings complement the PLS-SEM results by highlighting the importance of perceived behavioral control and environmental consciousness in fostering green purchase intention. The fsQCA results also reveal that different combinations of variables can lead to high levels of green purchase intention, suggesting that there are multiple pathways to encouraging environmentally friendly consumer behavior.

The fsQCA analysis provides a more nuanced understanding of the complex relationships among the variables and identifies the sufficient configurations leading to high levels of green purchase intention. The results emphasize the critical role of perceived behavioral control and environmental consciousness in

promoting green purchase intention and offer insights into the multiple pathways through which environmentally friendly consumer behavior can be encouraged.

## Conclusion

This study aimed to investigate the factors influencing green purchase intention and the moderating effects of environmental consciousness and perceived consumer effectiveness on these relationships. The results of the PLS-SEM analysis revealed that environmental knowledge, perceived value, and perceived behavioral control have significant positive effects on green purchase intention, while subjective norms do not. These findings are consistent with previous research that has highlighted the importance of knowledge, value perceptions, and behavioral control in shaping environmentally friendly consumer behavior (e.g., Joshi & Rahman, 2015; Liobikienė & Bernatoniene, 2017).

The moderating effects of environmental consciousness and perceived consumer effectiveness were also examined. The results showed that both variables significantly moderate the relationships between environmental knowledge, perceived value, and green purchase intention. These findings suggest that individuals with higher levels of environmental consciousness and perceived consumer effectiveness are more likely to translate their knowledge and value perceptions into green purchase intentions. This is in line with previous research that has emphasized the role of environmental consciousness and perceived consumer effectiveness in promoting environmentally friendly consumer behavior (e.g., Kang et al., 2013; Zhao et al., 2014).

To provide a more nuanced understanding of the complex relationships among the variables, an fsQCA analysis was conducted. The results revealed five sufficient configurations leading to high levels of green purchase intention, all of which include perceived behavioral control and environmental consciousness. These findings complement the PLS-SEM results and highlight the critical role of perceived behavioral control and environmental consciousness in fostering green purchase intention. The fsQCA results also suggest that there are multiple pathways to encouraging environmentally friendly consumer behavior, as different combinations of variables can lead to high levels of green purchase intention. This is consistent with the notion of equifinality, which suggests that different configurations of variables can lead to the same outcome (Ragin, 2008).

The present study contributes to the literature on green consumer behavior in several ways. First, it provides a comprehensive understanding of the factors influencing green purchase intention by examining the roles of environmental knowledge, perceived value, subjective norms, perceived behavioral control, environmental consciousness, and perceived consumer effectiveness. Second, it investigates the moderating effects of environmental consciousness and perceived consumer effectiveness, shedding light on how these variables influence the relationships between the predictors and green purchase intention. Third, the use of fsQCA offers a novel approach to understanding the complex relationships among the variables and identifies the sufficient configurations leading to high levels of green purchase intention.

The findings of this study have important practical implications for marketers and policymakers aiming to promote environmentally friendly consumer behavior. The results suggest that efforts should be directed towards increasing individuals' environmental knowledge, perceived value, and perceived behavioral control, as these factors have significant positive effects on green purchase intention. Additionally, fostering environmental consciousness and perceived consumer effectiveness can further enhance the impact of these factors on green purchase intention. Marketers and policymakers can use these insights to develop targeted interventions and communication strategies that address the specific factors and configurations identified in this study.

In conclusion, this study contributes to a better understanding of the factors influencing green purchase intention and the moderating effects of environmental consciousness and perceived consumer effectiveness. The findings highlight the importance of environmental knowledge, perceived value, perceived behavioral control, environmental consciousness, and perceived consumer effectiveness in shaping environmentally friendly consumer behavior. The use of both PLS-SEM and fsQCA provides a

comprehensive and nuanced understanding of the complex relationships among the variables, offering valuable insights for researchers and practitioners seeking to promote sustainable consumption.

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