




“Impacts of environmental awareness on enterprise behaviors in Vietnam”

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IMPACTS OF ENVIRONMENTAL AWARENESS ON ENTERPRISE BEHAVIORS IN VIETNAM

Abstract

With the rise in environmental awareness, enterprises are increasingly adopting environmentally responsible practices. This study aims to examine the influence of environmental awareness on the actual environmental behavior of enterprises in Vietnam, using an extended theory of planned behavior (TPB) framework that includes willingness to pay as an additional construct. Data were collected from 206 enterprise leaders across Vietnam and analyzed using structural equation modeling (SEM). The results show that environmental awareness positively influences attitude, subjective norms, perceived behavioral control, and willingness to pay ($\beta = 0.722$, $p < 0.001$ for all). Attitude ($\beta = 0.979$, $p < 0.001$), subjective norms ($\beta = 0.582$, $p < 0.001$), and willingness to pay ($\beta = 0.776$, $p < 0.001$) significantly impact environmental behavior, while perceived behavioral control ($\beta = 0.164$, $p > 0.05$) has no significant effect. Among mediators, willingness to pay exhibits the strongest indirect effect on the relationship between environmental awareness and behavior. These findings highlight the importance of integrating financial and social mechanisms into environmental strategies, suggesting that policies enhancing awareness and access to green financing can effectively promote sustainable behavior among enterprises in emerging economies.

Keywords

planned behavior, environmental awareness, willingness to pay, environmental protection, enterprise behavior

JEL Classification

D09, D21, M14

INTRODUCTION

Environmental awareness plays a key role in driving corporate sustainable development, shifting firms from passive compliance to proactive environmental practices (Dyllick & Hockerts, 2002; Zhou & Jin, 2023). In Vietnam, although legal frameworks like the Law on Environmental Protection (2020) promote environmental responsibility, regulatory compliance alone is not enough. Enterprises must develop internal awareness and meet both legal and consumer expectations (Cohen, 2022). Since the 1980s, green consumerism has supported businesses adopting sustainable practices (Butler, 2018).

Environmentally aware enterprises gain competitive advantages through innovation, efficiency, and brand credibility, with many improving performance through sustainability integration (McKinsey & Company, 2011). Additionally, modern FTAs with environmental commitments require firms to align with international standards or risk being excluded from global markets (Petts, 1998).

Vietnam's goals for high-income status by 2045 and net-zero emissions by 2050 highlight the role of its more 860,000 businesses (World Bank, 2022). However, green practices remain limited, and empirical research on corporate environmental behavior is still scarce. To fill this gap, this study extends the TPB (Ajzen, 1991) model by incorporating environmental awareness and willingness to pay for environ-

mental protection, two constructs that reflect internal values and external economic commitment. This extended framework is applied to investigate the determinants of actual environmental protection behavior among enterprises in Vietnam, providing insights for both academic research and policymaking.

1. LITERATURE REVIEW AND HYPOTHESES

The relationship between environmental awareness and pro-environmental behavior has been extensively studied across various contexts worldwide. A high level of environmental awareness often leads to changes in attitudes, intentions, and actions aimed at reducing negative impacts on ecosystems and natural resources.

Ajzen (1991) developed the theory of planned behavior (TPB), which has become one of the most widely used models for predicting individual behavioral intentions and actions (Zahedi et al., 2019). Subsequent research has applied TPB to environmental contexts, examining how environmental awareness influences green purchasing behavior (Chen & Tung, 2014). Wang et al. (2016) concluded that environmental awareness does not directly affect behavior but instead exerts influence through the mediating variables of attitude, subjective norms, and perceived behavioral control. Bamberg (2003) provided empirical support for this indirect pathway in a survey of 380 university students, revealing that environmental awareness significantly shaped behavioral intention via these three mediators.

From the enterprise perspective, environmental awareness promotes not only compliance with environmental laws but also proactive behavior such as the development of internal environmental policies and programs (Bansal & Roth, 2000; Simpson et al., 2004; Williamson et al., 2006). Salimi (2019) and Ruslim et al. (2022) have asserted that environmental awareness has a positive impact on attitude, subjective norms, and perceived behavioral control in organizational settings. In extended versions of TPB, environmental awareness has also been shown to significantly influence willingness to pay for green solutions (Gao et al., 2017; Shen, 2012).

In a study of Indian microenterprises, it was found by Mor et al. (2020) that sustainability is more

strongly influenced by entrepreneurial experience and investment capacity than by education level or gender. Taken together, these findings suggest that environmental awareness should be regarded as a critical antecedent to pro-environmental intentions and behaviors at both individual and organizational levels. As a result, the integration of environmental awareness into the Theory of Planned Behavior (TPB) is considered a comprehensive approach for analyzing environmentally responsible business conduct. Therefore, the TPB model is appropriately extended in the investigation of enterprise-level environmental behavior.

In the current environmental context, businesses face increasing pressure to comply not only with regulatory frameworks but also with consumer expectations for environmentally friendly practices. These external pressures are conceptualized within the TPB as subjective norms, which numerous studies have found to positively influence firms' environmental behavior (Chen & Tung, 2014; Verma & Chandra, 2018). Perceived behavioral control is another crucial determinant and has similarly been shown to affect environmental protection behavior (Chen & Tung, 2014). Suppliers and customers often serve as key sources of environmental information, capable of encouraging firms to adopt greener practices. Moreover, the environmental commitment of business leaders is often reflected in the allocation of time and resources to environmental initiatives (Naffziger et al., 2003). Even in the absence of regulatory requirements, environmentally aware businesses often voluntarily adopt eco-friendly processes, driven by both market logic and internal values (Bansal & Roth, 2000). This suggests that businesses are not only reactive but also proactive in their environmental efforts, shaped by social influences and internal beliefs. Consequently, subjective norms and perceived behavioral control are essential mechanisms that translate environmental awareness into concrete business actions. Their inclusion in behavioral models is crucial to understanding the full spectrum of enterprise environmental responsibility.

A strong willingness to pay (WTP) for environmentally responsible products and technologies has been consistently linked to positive environmental behavior in both consumer and business contexts (Kang et al., 2012; Moser, 2015; Yadav & Pathak, 2017). However, in the context of small and medium-sized enterprises (SMEs), the translation of willingness into action is often constrained by limited financial resources. According to the Australian Bureau of Statistics (2003), the cost of implementing environmental management systems presents a significant barrier for many SMEs. While many SMEs may have the intent and motivation to engage in environmental practices, they often lack the financial autonomy or investment capacity to do so. This disparity between behavioral intention and actual behavior calls attention to the moderating role of perceived financial control in the TPB framework. Therefore, understanding the financial constraints faced by SMEs is critical for designing policies and incentives that bridge the gap between intention and action. Further empirical research is needed to explore how perceived control over resources interacts with willingness to pay to influence environmental behavior among enterprises.

In summary, the existing literature confirms that environmental awareness, attitude, subjective norms, perceived behavioral control, and willingness to pay are essential factors influencing pro-environmental behavior in both individuals and enterprises. Extending the TPB framework to in-

corporate these variables provides a robust theoretical foundation for examining environmentally responsible actions at the enterprise level.

This study aims to investigate how environmental awareness influences the actual environmental behavior of enterprises in Vietnam. Building upon the extended theory of planned behavior proposed by Xu et al. (2020), the study examines the mediating roles of attitude, subjective norms, perceived behavioral control, and willingness to pay in this relationship (Figure 1). The following hypotheses are proposed:

- H1: Environmental awareness has a positive effect on attitude toward environmental behavior.*
- H2: Environmental awareness has a positive effect on subjective norms.*
- H3: Environmental awareness has a positive effect on perceived behavioral control.*
- H4: Environmental awareness has a positive effect on willingness to pay for environmental protection.*
- H5: Attitude positively influences the actual environmental behavior of enterprises.*
- H6: Subjective norms positively influence the actual environmental behavior of enterprises.*

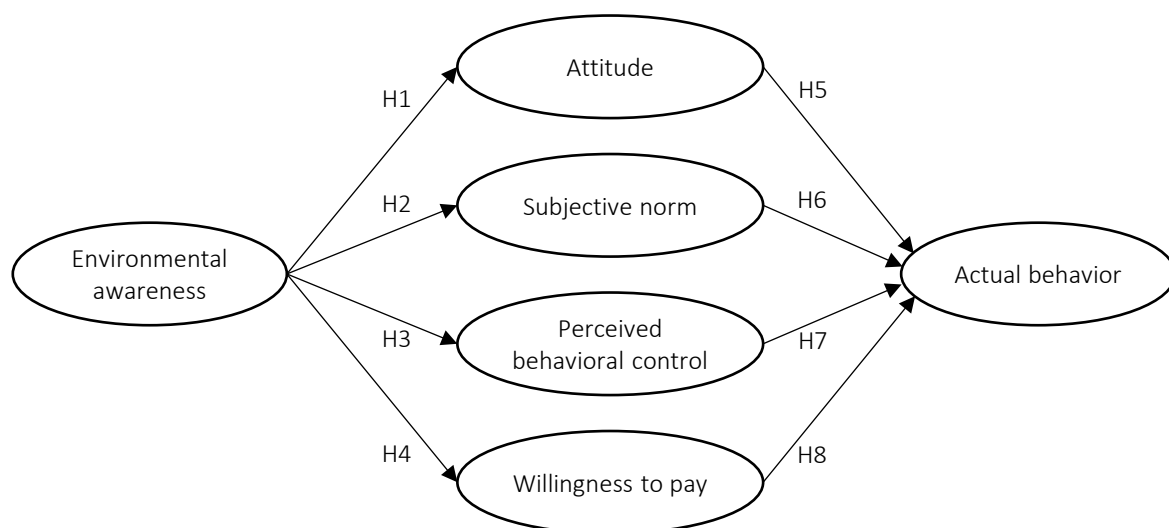


Figure 1. Research model

- H7: *Perceived behavioral control positively influences the actual environmental behavior of enterprises.*
- H8: *Willingness to pay positively influences the actual environmental behavior of enterprises.*
- H9: *Environmental awareness indirectly influences actual environmental behavior through the mediating roles of attitude, subjective norms, perceived behavioral control, and willingness to pay.*

2. METHODS

2.1. Data

The analysis was conducted through a survey administered via Google Forms, a method commonly employed by scholars for online data collection (Raju & Harinarayana, 2016). The research participants were leaders of enterprises in Vietnam, with a concentration in three main areas: the North, the South, and the Central region. According to data from the General Statistics Office of Vietnam (2022), the distribution rate of small and medium enterprises in Vietnam accounts for a large proportion in these three regions.

This convenient sampling was chosen as the mode of participant selection for this study due to its relative advantages in terms of time and cost compared to other sampling methods (Etikan et al., 2016). The research process followed the principles of ethical and professional conduct. Before taking part, all participants gave informed verbal consent in accordance with the necessary requirements.

The data were collected from July 18, 2023, to September 19, 2023. A total of 210 questionnaires were returned, of which 206 met the criteria and were deemed valid for analysis. According to Hair et al. (1998), the number of samples selected must be five times the observed variables. The study has 22 observed variables, so the sample size of 206 businesses satisfies the theoretical basis. The demographic data are presented in Table 1.

Table 1. Descriptive statistics

Factor	Quantity	Percentage
Gender		
Male	116	56.31%
Female	90	43.69%
Business field		
Education	23	11.17%
Commerce and services	37	17.96%
Production and business	66	32.04%
Construction	25	12.14%
Agriculture, forestry, and fisheries	49	23.79%
Other	6	2.91%
Business area		
Binh Duong	10	4.85%
Northern provinces	49	23.79%
Southern provinces	44	21.36%
Central provinces	35	16.99%
Hanoi	32	15.53%
Ho Chi Minh City	36	17.48%
Age of the business		
< 5 years old	65	31.55%
> 10 years old	90	43.69%
5–10 years old	51	24.76%
Registered capital (unit: million VND)		
Under 500	36	17.48%
Over 10,000	57	27.67%
1,000–5,000	51	24.76%
5,000–10,000	25	12.14%
500–1,000	37	17.96%
Annual revenue of the business (unit: million VND)		
Under 100	30	14.56%
Over 10,000	65	31.55%
1,000–5,000	25	12.14%
100–500	32	15.53%
5,000–10,000	22	10.68%
500–1,000	32	15.53%

According in Table 1, 56.31% of business leaders surveyed were male, and the most common business field was production and business with 31.07%. The survey was conducted evenly across all provinces and cities, with major economic centers in Hanoi (15.53%) and Ho Chi Minh City (17.48%). By region, the North accounted for 39% and the South accounted for 43.69%. Approximately 43.69% of the surveyed enterprises are over 10 years old, 27.67% of the businesses have a charter capital exceeding 10 billion VND, and the majority of them (31.55%) have a turnover of over 10 billion VND. According to the data from the General Statistics Office of Vietnam (2022), the total number of enterprises in the Northern region account-

ed for 36.13%, the South for 47.93%, and industrial and construction enterprises for 32% of the total number of businesses in the country in 2022. The number of businesses with registered capital of over 10 billion VND accounted for 30% of the total number of businesses. Therefore, the survey sample is in line with the current situation of enterprises in Vietnam.

After collection, the research data were coded and tested using the SEM model with the support of the Stata software. The Stata software is fully suitable for SEM analysis, as demonstrated by Cain (2021).

2.2. Measurement

The scales used in this study were based on and adopted from Xu et al. (2020). In addition, subjective norm, perceived behavioral control, and actual behavior were assessed using the scale developed by Liston-Heyes and Brust (2014). The scales were adjusted to be appropriate for research on the environmental behavior of businesses in Vietnam. With the goal of economic growth, Vietnamese businesses focus more on production output than on green, environmentally friendly products. Therefore, the scales on environmental awareness, attitude, and subjective norms are only based on the requirements of law, customers, market, etc. The internal strength of a business has not yet been fully assessed. In addition, resource constraints are also a major obstacle for businesses in Vietnam, making it impossible to measure willingness to pay with specific numbers. All variables were measured using a 5-point Likert scale with 1 as Strongly disagree and 5 as Strongly agree. This means that the higher the score, the more positive the measurement factor.

3. RESULTS

A structural reliability analysis was conducted, followed by a factor analysis, based on guidelines provided by Hair et al. (1998) and Verma and Chandra (2018); loading was proposed on the benchmark of 0.70. Structural reliability is often assessed using composite reliability and Cronbach's alpha. The results of the Cronbach's alpha index to assess the suitability of the scale are presented in Table 2.

Table 2. Reliability test

Items	Definitions	Loading
Environmental awareness (EA): Cronbach's alpha = 0.9559		
EA1	Businesses need to comply with environmental regulations	0.9430
EA2	Businesses engage in environmental protection to meet market requirements and customer demands	0.9387
EA3	Businesses are concerned about current environmental issues and are committed to sustainable development	0.9401
EA4	Businesses build their brands and increase their competitiveness	0.9547
EA5	Businesses engage in environmental protection to reduce costs and increase benefits (investing in technology, using fuel efficiently, and conserving resources)	0.9508
Attitude toward behavior (ATT): Cronbach's alpha = 0.9657		
ATT1	Businesses engaging in environmental protection demonstrate their social responsibility	0.9636
ATT2	Businesses engaging in environmental protection have a positive impact on customers and partners	0.9429
ATT3	Businesses engaging in environmental protection have a positive impact on their brands	0.9414
Subjective norm (SJN): Cronbach's alpha = 0.9041		
SJN1	Businesses are under pressure from environmental regulations, such as fines or closures	0.8932
SJN2	Businesses are under pressure from the market, such as demands for green, environmentally friendly products	0.8159
SJN3	Businesses are under pressure to improve their competitiveness	0.8759
Perceived behavioral control (PBC): Cronbach's alpha = 0.8828		
PBC1	Businesses have the resources they need to protect the environment	0.8200
PBC2	Businesses are committed to sustainable development	0.8197
PBC3	Businesses engage in environmental protection to gain access to green credit and financial resources	0.8626
Willingness to pay (WTP): Cronbach's alpha = 0.9588		
WTP1	Businesses have WTP the cost of producing green, environmentally friendly products	0.9477
WTP2	Businesses have WTP the cost of adopting environmentally friendly technologies	0.9416
WTP3	Businesses have WTP the cost of adopting environmental management systems	0.9364

Table 2 (cont.). Reliability test

Items	Definitions	Loading
WTP4	Businesses have WTP the cost of pursuing environmental protection strategies	0.9573
Actual behavior (ACT): Cronbach's alpha = 0.9467		
ACT1	Businesses are implementing environmental management systems	0.9213
ACT2	Businesses are implementing environmentally friendly technologies	0.9271
ACT3	Businesses are conducting annual environmental impact assessments	0.9275
ACT4	Businesses are investing in research and development and producing environmentally friendly products	0.9451

According to Table 2, all Cronbach's alpha indicators were greater than 0.8. The factor loadings of the component variables are all smaller than the factor loadings of the factor group, and there is no case of deleting any observed variables that can make the Cronbach's alpha of each scale greater than the group factor. Therefore, all observed variables were accepted and used in the subsequent analysis.

The results of factor analysis showed that six factors were created; the total extracted variance was

0.8145, which was equal to 81.45% of the data variation. This is consistent with the expected factor division in the research model.

The analysis of the EFA matrix resulted in all factor loadings satisfying greater than 0.5, and there was no case of any variable loading on both factors with similar factor loadings greater than 0.5. The factors met the conditions of convergence and distinction in the EFA analysis; there was no factor confusion, and the model variable expectations were met (Fornell & Larcker, 1981).

The KMO test for the KMO coefficient = 0.9716 > 0.5; therefore, the data for analysis were completely appropriate. Bartlett's test has a *p*-value of 0.000; thus, it is satisfactory for analysis.

Figure 2 presents the Stata results for the SEM model. The results of the CFA were based on the model fit analysis method of Hu and Bentler (1999), which included the following indicators: *p*-value = 0.000; CFI = 0.951 > 0.8; TLI = 0.942 > 0.9; RMSEA = 0.076 < 0.8. All the indicators met the requirements; therefore, the model was suitable for the research data.

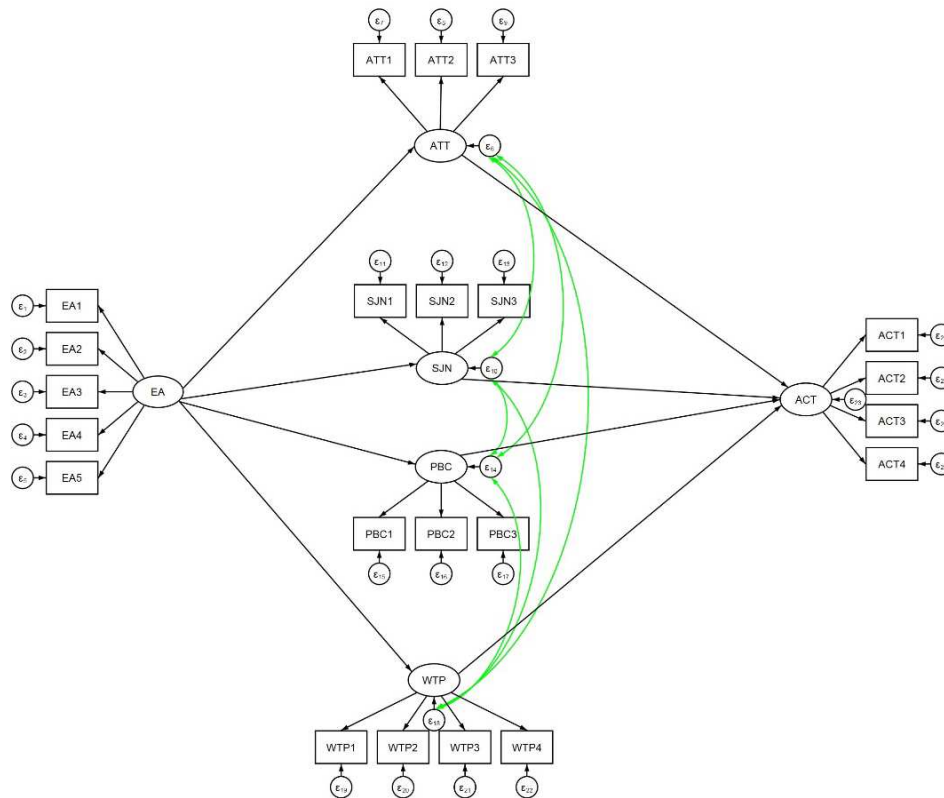


Figure 2. SEM research model

Table 3. SEM model estimation

Independent variables	Dependent variables	Coef.	Expectation	Results
ATT	EA	0.536***	+	Adequate
SJN	EA	0.580***	+	Adequate
PBC	EA	0.792***	+	Adequate
WTP	EA	0.772***	+	Adequate
ACT	ATT	0.547***	+	Adequate
	SJN	0.232***	+	Adequate
	PBC	-0.109	+	Inadequate
	WTP	0.532***	+	Adequate

Note: *** $p < 0.001$.

ATT reflects their corporate social responsibility, fosters positive perceptions among customers and partners, and contributes to enhancing brand image and reputation; SJN is measured by the extent to which businesses perceive multidimensional external pressures to adopt environmentally responsible practices, including regulatory pressure, market pressure, and competitive pressure; PBC is measured by the extent to which businesses believe they have the resources, commitment, and financial access needed to implement environmentally responsible practices; WTP refers to the extent to which businesses are willing to incur costs to implement environmentally friendly practices; ACT refers to the extent to which businesses take concrete actions to protect the environment.

The research results in Table 3 show that environmental awareness had a positive impact on all four factors: attitude, subjective norm, perceived behavioral control, and willingness to pay. Therefore, hypotheses *H1*, *H2*, *H3*, and *H4* were supported, which is consistent with the findings of previous studies (Wang et al., 2018; Xu et al., 2020). When enterprises increase their environmental awareness, they will have better attitudes and judgments of objective factors and subsequently have a willingness to pay more money for environmental protection.

Actual behavior is affected by attitude, subjective norms, and willingness to pay in the same direction. Hypotheses *H5*, *H6*, and *H8* are supported; thus the findings are consistent with the research results of Wang et al. (2016), Ru et al. (2019), Chen and Tung (2014), Verma and Chandra (2018), Moser (2015), and Yadav and Pathak (2017). Meanwhile, perceived behavioral control was found to have no significant effect, suggesting that actual envi-

ronmental behavior among businesses is less influenced by factors such as human resources or access to financing. This finding contrasts with the results of Yadav and Pathak (2017). These scholars indicate that attitude and willingness to pay have a greater impact than subjective norms.

Improved business attitudes increased external pressure, while businesses' willingness to invest in environmental protection improved their environmental protection behavior. Hence, it is necessary to raise the awareness of businesses regarding environmental protection. With better awareness, businesses will understand and invest appropriately, thus leading to increasingly positive behavior. This result is shown in Figure 3.

The results show that environmental awareness has a positive impact on attitudes toward environmental protection, subjective norms, and willingness to pay. Attitude toward behavior, subjective norms, and willingness to pay were mediating factors affecting the actual behavior of environmental protection. Environmental awareness is a significant element affecting environmental protection activities. An increase in environmental awareness may not directly induce an increase in environmental protection activities. Environmental protection activities may depend on the combined influence of environmental awareness and the four components of the TPB extension model. Therefore, it is essential to analyze the mediating effects of these variables.

The mediating effect was examined using the two-step analysis method outlined by Xu et al. (2020), which involved evaluating the impact of the mediating factor and the independent variable on actual behavior, and assessing whether the mediat-

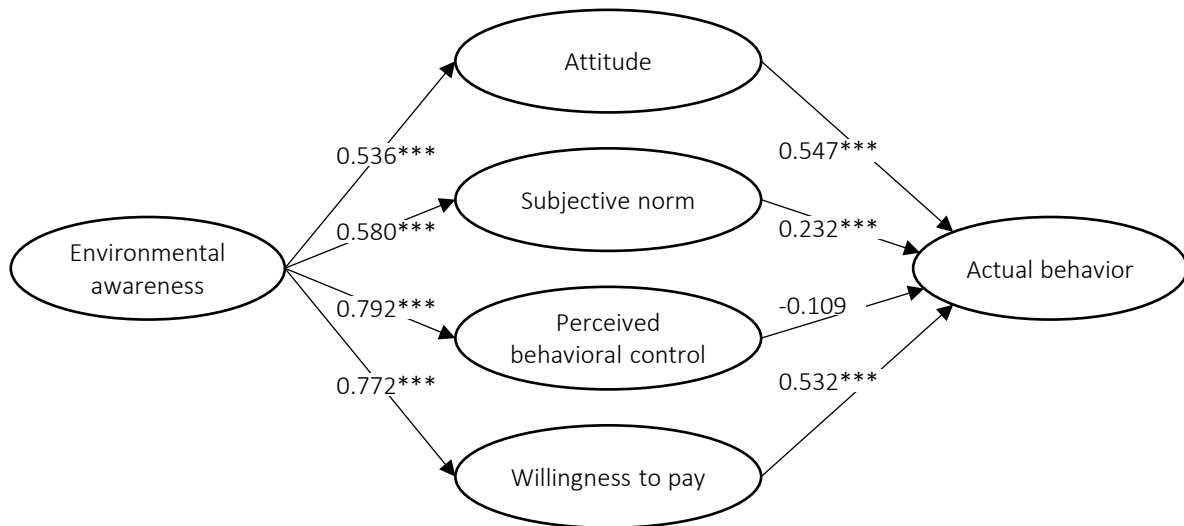


Figure 3. Results of the research model

Table 4. Regression analysis

IV	M	DV	IV-DV	IV-M	M-DV	Mediating effect
EA	ATT	ACT	0.722***	0.979***	0.350***	Partial
EA	SJN	ACT	0.722***	0.582***	0.211***	Partial
EA	PBC	ACT	0.722***	0.778***	0.164	Partial
EA	WTP	ACT	0.722***	0.776***	0.639***	Partial

Note: *** $p < 0.001$; IV: independent variable, M: mediator, DV: dependent variable, EA means environmental awareness.

ing effect actually existed through the impact analyzed in step 1. Table 4 presents the results of the regression analysis of the variables.

The research findings indicate that mediating variables play a significant role in influencing the environmental protection behavior of enterprises. Both the independent variable of environmental protection awareness and the mediating variable have proven to be influential, so raising awareness of environmental protection for enterprises is an important factor, but it does not directly increase the environmental protection behavior of enterprises. The driving factors were integrated to create the actual behavior of enterprises.

4. DISCUSSION

The results of this study show that environmental awareness has a positive impact on all four factors: attitude toward behavior, subjective norms, perceived behavioral control, and willingness to pay, satisfying hypotheses H1, H2, H3, and H4. In practice, the environmental aware-

ness of Vietnamese enterprises is receiving increasing attention. The proportion of facilities violating environmental laws has tended to decrease significantly: from 65.6% in 2015 to 24.9% in 2020, a decrease of 2.6 times compared to 2015 (Nam, 2021). However, the environmental awareness of enterprises has the most significant impact on perceived behavioral control, which is in line with the practice in Vietnam. Vietnamese enterprises have been and are ready to seize opportunities to move toward the goal of sustainable development by investing in production and business activities that aim to achieve this goal, or by innovating production technologies, processes, and management methods to meet the requirements of environmental protection laws (Nguyen, 2023). The attitude toward the environmental behavior of Vietnamese enterprises in recent times has achieved high results. Anh et al. (2019) show that the corporate environmental responsibility and Environmental Performance Index of 220,064 Vietnamese enterprises are both high. This again confirms the hypothesis that enterprises' environmental awareness has a positive impact on their behavior.

In the extended TPB model, the results show that attitudes toward behavior, subjective norms, and willingness to pay have a positive impact on the actual behavior of Vietnamese enterprises, which is in line with hypotheses *H5*, *H6*, and *H8*. Indeed, the actual behavior of Vietnamese enterprises has increased in terms of both quality and quantity. Some rapidly developing areas include solid waste collection and transportation, solid waste treatment facilities, the collection and transportation of hazardous solid waste, centralized treatment of domestic wastewater, and the treatment of small-scale, dispersed domestic wastewater. Along with the increase in attitude toward behavior, subjective norms, as manifested through environmental standards for goods and the growing market demand for green and environmentally friendly products, have consistently improved environmental activities. Compliance with environmental laws is not only a “must-do” obligation for enterprises, but has gradually become a “driving force for sustainable profit” for enterprises. A typical example is in the fields of organic agriculture and clean agriculture, where many large enterprises have shifted their investment and business direction, such as TH true-milk, Vinamilk, VinGroup, and Organic Da Lat Company, which have invested in waste collection and treatment systems and have participated in supporting programs for environmental protection. In particular, businesses in the field of environmental supply and services have begun to become a highly attractive field, with many types of businesses being invested in and developed by organizations and individuals, and the environmental field from many sources of capital initially forms a system of environmental services outside of public utilities (Chinh & Manh, 2021). Some enterprises, including Toyota Vietnam Automobile Company, Panasonic Vietnam Co., Ltd., and Friesland Campina Vietnam Co., Ltd., have implemented actual environmental protection behavior. They have cooperated with other enterprises such as Vinamilk, Panasonic, Toyota Vietnam, Honda Vietnam, Unilever Vietnam, ABBank, Viettinbank, and Heiniken to actively implement activities such as planting trees, building green chemistry roads, environmental protection activities, responding to climate change, preventing drought, and saltwater intrusion throughout the country (Dung, 2023).

The willingness to pay has a significant impact on the actual behavior of enterprises in Vietnam, supporting the theory of Moser (2015) and Xu et al. (2020). Indeed, enterprises’ investments in technology for environmental protection and climate change adaptation are becoming increasingly diverse and abundant. Environmental protection activities, the application of renewable energy sources, and greenhouse gas emission reduction have been paid attention to and widely applied in many sectors by enterprises. The activities of greening production, ensuring the principles of environmental friendliness, investing in the development of natural capital, and actively preventing and treating pollution have been emphasized. Awareness of the role of green growth has been raised, creating a wave of green investment such as wind, solar, and waste-to-energy (Dung, 2023).

However, besides enterprises with awareness and actions on environmental protection in the production and business processes, there are still enterprises that have not turned awareness into action. Many enterprises are still limited in investment in environmental protection; environmental protection activities are not carried out regularly, and have not become actual actions, but are coping and seasonal. Research on recent cases of environmental law violations in Vietnam shows that investment in environmental protection in some enterprises has not been given due attention, and some enterprises have invested in waste and wastewater treatment systems that are not qualified to operate (Ministry of Justice & the Association of Small and Medium Enterprises, 2022). This shows the gap between awareness, behavioral control, attitude, and actual behavior. Although the environmental awareness of enterprises has a positive impact on behavioral control attitude, Vietnamese enterprises still face many limitations in terms of resources, such as capital, human resources, and technology. Enterprises can be transferred to advanced and modern technologies, but the human factors and ability levels are still not maintained. The above contradiction means that enterprises are hesitant to produce green, sustainable products, instead focusing solely on profit goals. In addition, high initial investment costs have a significant impact on access to green technologies. According to a survey on the green development trends of enterprises under the project of Ho Chi

Minh City University of Technology, up to 70% of enterprises surveyed have not heard of the Green Label Vietnam certification, more than 50% of enterprises are not concerned about climate change, 60% of enterprises are not willing to invest in green products (Nguyen, 2015). The biggest difficulty for enterprises, especially small and medium-sized enterprises, is the contradiction between two goals: profit and green growth. Most small and medium-sized enterprises lack the capital to invest in the development of green products (Thuy, 2022). Thus, the research results reject hypothesis H7, which

is consistent with the reality of enterprises in Vietnam. However, this result does not support the findings of Yadav and Pathak (2017) and Xu et al. (2020).

In addition, the survey results also show that Vietnamese enterprises engage in various practical activities to protect the environment, such as planting trees, environmental charity, using environmentally friendly materials, limiting and reusing plastic bags, educating students about environmental protection, conserving natural resources, and utilizing renewable energy.

CONCLUSION

This study aimed to examine the factors influencing actual environmental protection behavior among Vietnamese enterprises by employing an extended Theory of Planned Behavior (TPB) framework. The model was expanded to include environmental awareness and willingness to pay for environmental protection. The empirical results indicate that attitude and willingness to pay positively influence actual environmental protection behavior, while perceived behavioral control does not exhibit a significant effect. Additionally, environmental awareness was found to indirectly affect actual behavior through the four mediating variables of the extended TPB model: attitude, subjective norms, perceived behavioral control, and willingness to pay. These findings highlight that an increase in environmental awareness does not directly translate into behavioral change unless it is mediated by psychological and motivational factors.

Based on these results, several policy and managerial implications can be drawn. For policymakers, especially the Vietnamese government, it is essential to formulate and implement targeted policies that provide both financial and technical support to enterprises, enabling them to engage more effectively in environmental protection activities. Since perceived behavioral control was found to be insignificant, this suggests that enterprises currently face substantial barriers, particularly in terms of limited access to green finance and resource constraints. Therefore, expanding access to green credit lines, offering capacity-building programs, and creating incentives for eco-innovation are crucial.

For enterprises, the findings suggest that internal efforts to strengthen environmental attitudes and raise organizational willingness to invest in green initiatives are key drivers of behavioral change. Enterprises should proactively invest in developing their human capital and enhancing financial planning to support sustainability transitions.

Despite its contributions, this study is subject to several limitations. First, data collection relied solely on online surveys, which may limit the generalizability of the findings. Future research could incorporate in-depth case studies or mixed-method approaches to provide richer contextual insights. Second, the current model does not account for potentially influential variables such as competitive advantage, ethical orientation, or organizational culture. Incorporating these factors may offer a more nuanced understanding of enterprise behavior. Third, environmental behavior was considered as a broad construct; future studies should disaggregate this into specific practices such as green production, eco-innovation, or the implementation of environmental management systems to capture more precise behavioral dynamics.

This study highlights the significance of psychological constructs, specifically attitudes and willingness to pay, in translating environmental awareness into practical behavior. A multi-level approach that combines supportive public policy with enterprise-level transformation is essential to foster substantial and sustainable environmental practices among businesses in Vietnam.

AUTHOR CONTRIBUTIONS

Conceptualization: Thanh Huyen Nguyen Thi, Hoi Quoc Le.
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 Resources: Thanh Huyen Nguyen Thi, Hoi Quoc Le.
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