FACTORS INFLUENCING INDIVIDUAL CUSTOMERS' GREEN BANKING PRODUCT USAGE BEHAVIOR IN VIETNAM: AN EXTENDED THEORY OF PLANNED BEHAVIOR (TPB) APPROACH

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ABSTRACT

This study aims to identify and measure the key factors influencing individual customers' intentions and actual behavior regarding green banking product usage in the specific context of Thu Duc City, Ho Chi Minh City. Given the modest uptake of green financial products in Vietnam despite supportive government policies, this research seeks to bridge the gap between sustainable policy and consumer action. The research adopts a mixed-methods approach. Following a qualitative phase with nine experts to refine the measurement scales, a quantitative survey was conducted among 495 individual customers using digital banking services. The conceptual framework extends the Theory of Planned Behavior (TPB) by integrating Green Product Knowledge and Environmental Concern. Data were analyzed using Cronbach's Alpha, Exploratory Factor Analysis (EFA), and Structural Equation Modeling (SEM). The empirical results confirm that all proposed hypotheses are supported. Environmental Attitude emerged as the strongest predictor of usage intention (beta = 0.568), followed by Environmental Awareness (beta = 0.276) and Perceived Behavioral Control (beta = 0.192). Notably, Usage Intention acts as a powerful mediator, significantly driving actual Usage Behavior (beta = 0.667). In contrast, Green Product Knowledge and Subjective Norms showed positive but relatively weaker impacts. This research contributes to the literature by providing a comprehensive empirical model for green banking adoption in an emerging market. By extending the TPB with context-specific variables like green knowledge and awareness, it offers actionable management implications for Vietnamese commercial banks to develop effective marketing strategies and environmentally friendly digital services.

Keyword: Green Products, Green Banking, Theory of Planned Behavior (TPB), Structural Equation Modeling (SEM), Vietnam.

1. INTRODUCTION

Global climate change and escalating environmental crises have forced the international community to transition toward sustainable development models. In this context, the finance and banking sector is recognized as a central driver in shifting resources toward a green economy. Following international frameworks such as the Paris Agreement (COP21) and ESG (Environmental, Social, and Governance) standards, financial institutions are increasingly integrating environmental factors into their core business strategies. Vietnam has demonstrated a strong commitment to this trend through the National Green Growth Strategy and specific directives from the State Bank of Vietnam, such as

Circular 17/2022/TT-NHNN, aimed at promoting green credit and managing social-environmental risks.

Individual customers (ICs) play a pivotal role in the success of green banking initiatives. While institutional credit often dominates the discourse, the collective behavior of ICs regarding eco-friendly digital services and green savings products significantly impacts a bank's environmental performance and long-term stability. In Vietnam, although green credit reached approximately 680,000 billion VND by mid-2024, it only accounts for about 4.5% of total outstanding debt. This suggests that the adoption of green products by individual consumers

remains modest and has not yet met expectations despite proactive government policies.

Despite the growing body of literature on green banking, a significant research gap remains within the Vietnamese context. Most existing studies focus on macro-level policies or organizational perspectives, often overlooking the internal psychological drivers of individual consumers. Furthermore, while the Theory of Planned Behavior (TPB) is a common framework for analyzing green consumption, many studies fail to account for the unique characteristics of intangible financial services. Specifically, the role of "Green Product Knowledge", the ability to understand complex green financial structures, and "Environmental Concern" as integrated predictors of behavior has not been comprehensively explored for ICs in rapidly urbanizing areas like Thu Duc City.

This study aims to address these gaps by developing an extended TPB model to investigate the factors influencing green product usage behavior among ICs. By integrating green knowledge and environmental awareness into the traditional framework, the research seeks to answer: Which factors most significantly drive ICs toward green banking, and how can these insights be leveraged to refine marketing and product development strategies? The findings are expected to provide a robust theoretical foundation and practical management implications for commercial banks to foster sustainable financial growth in Vietnam

2. LITERATURE REVIEW & HYPOTHESES

2.1. Theoretical Framework: Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB), developed by Ajzen (1991), serves as the foundational framework for this study. TPB posits that an individual's behavior is driven by their Behavioral Intention, which is determined by three core components: Attitude (ATT), Subjective Norm (SN), and Perceived Behavioral Control (PBC). In the context of green banking, TPB has been widely validated as a robust model for predicting sustainable consumption. However, to enhance the explanatory power in the financial services sector, this study extends the original model by integrating two context-specific variables: Green Product Knowledge (GPK) and Environmental Concern (EC).

2.2. Hypotheses Development

Environmental Attitude (ATT) and Usage Intention Attitude reflects the degree to which a person has a favorable or unfavorable evaluation of a specific behavior. In green banking, when customers perceive that using eco-friendly services contributes to environmental protection, they develop a positive intention to adopt them. Following Yadav & Pathak (2016), who found that attitude is the strongest predictor of green purchase intention in emerging markets, we propose:

- **H1:** *Environmental Attitude has a positive impact on the Intention to use green banking products.*

Subjective Norm (SN) and Usage Intention Subjective norm refers to the perceived social pressure to perform or not perform the behavior. If an individual believes that "significant others" (family, friends, or colleagues) value environmental sustainability, they are more likely to adopt green banking. This aligns with findings by Paul et al. (2016) regarding green product consumption.

- **H2:** *Subjective Norm has a positive impact on the Intention to use green banking products.*

Perceived Behavioral Control (PBC) and Usage Intention PBC represents the perceived ease or difficulty of performing a behavior, based on past experience and anticipated obstacles (e.g., technology access, transaction costs). In digital green banking, higher self-efficacy in using banking apps increases usage intention.

- **H3:** *Perceived Behavioral Control has a positive impact on the Intention to use green banking products.*

Green Product Knowledge (GPK) and Usage Intention Knowledge about green financial products (such as green credit or eco-gift cards) reduces information asymmetry and increases consumer confidence. According to Wang et al. (2014), knowledge is a prerequisite for forming sustainable intentions.

- **H4:** *Green Product Knowledge has a positive impact on the Intention to use green banking products.*

Environmental Concern (EC) and Usage Intention Environmental concern is the degree to which people are aware of environmental problems and support efforts to solve them. Individuals with high environmental awareness tend to prioritize "green" choices to align with their values.

- **H5:** *Environmental Concern has a positive impact on the Intention to use green banking products.*

Intention and Actual Usage Behavior According to Ajzen's original TPB model, intention is the immediate antecedent of behavior. The stronger the intention to engage in green banking, the more likely the actual adoption will occur.

- **H6:** *Usage Intention has a positive impact on the actual Usage Behavior of green banking products.*

2.3. Research Model

Based on the hypotheses above, the proposed conceptual framework is illustrated as follows:
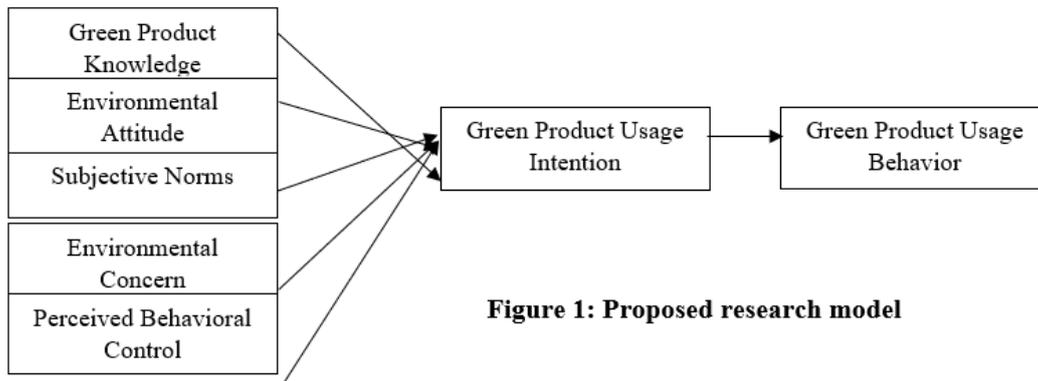

Figure 1: Proposed research model

Source: Author's proposal

3. RESEARCH METHODOLOGY

3.1. Measurement and Operationalization

The measurement scales for the constructs in this study were adapted from validated instruments in existing literature to ensure content validity. All items were measured using a 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").

- Green Product Knowledge (GPK): Adapted from Cheah & Phau (2011) and Schlegelmilch et al. (1996), focusing on the understanding of digital banking benefits such as carbon reduction and paperless processes.

- Environmental Attitude (ATT): Derived from Tanner & Kast (2003), measuring the individual's sense of responsibility toward environmental protection.

- Subjective Norm (SN): Based on the original conceptualization by Ajzen (1991), assessing social pressure from family, friends, and colleagues.

- Environmental Concern (EC): Adapted from Bamberg & Moser (2007) to measure awareness of climate change and human impact on nature.

- Perceived Behavioral Control (PBC): Derived from Paul, Modi & Patel (2016) and Chan & Lau (2004), evaluating the ease of access and self-efficacy in using green services.

- Intention and Behavior (INT & BEH): Adapted from Ajzen (1991) and Sheeran (2002), focusing on future usage plans and the frequency of digital banking adoption.

3.2. Sampling and Data Collection

The study utilized a convenience sampling method targeting individual customers in Thu Duc City, a major urban and technological hub in Vietnam.

- Sample Size: Following the rule of thumb by Nguyen Dinh Tho (2013), the minimum sample size required was 125 (5 times the 25 observed variables). To increase reliability, the study initially targeted 550 respondents.

- Data Collection: Data was collected between May 2025 and June 2025 through an online Google Forms survey.

- Final Sample: Out of 527 responses, 32 were excluded due to invalidity (incomplete or straight-lining), resulting in 495 valid responses for final analysis.

3.3. Data Analysis Procedure

The data were processed using SPSS 27.0 and AMOS 24 software following a rigorous multi-step analytical procedure:

1. Descriptive Statistics: To summarize the demographic profile of the respondents.

2. Reliability Analysis: Utilizing Cronbach's Alpha to ensure internal consistency (threshold > 0.7).

3. Exploratory Factor Analysis (EFA): To explore the underlying structure of the data and group variables into factors.

4. Confirmatory Factor Analysis (CFA): To validate the measurement model, testing for convergent validity (AVE > 0.5, CR > 0.7) and discriminant validity.

5. Structural Equation Modeling (SEM): To test the proposed hypotheses and evaluate the overall model fit using indices such as CMIN/df, GFI, CFI, and RMSEA.

4. RESULTS

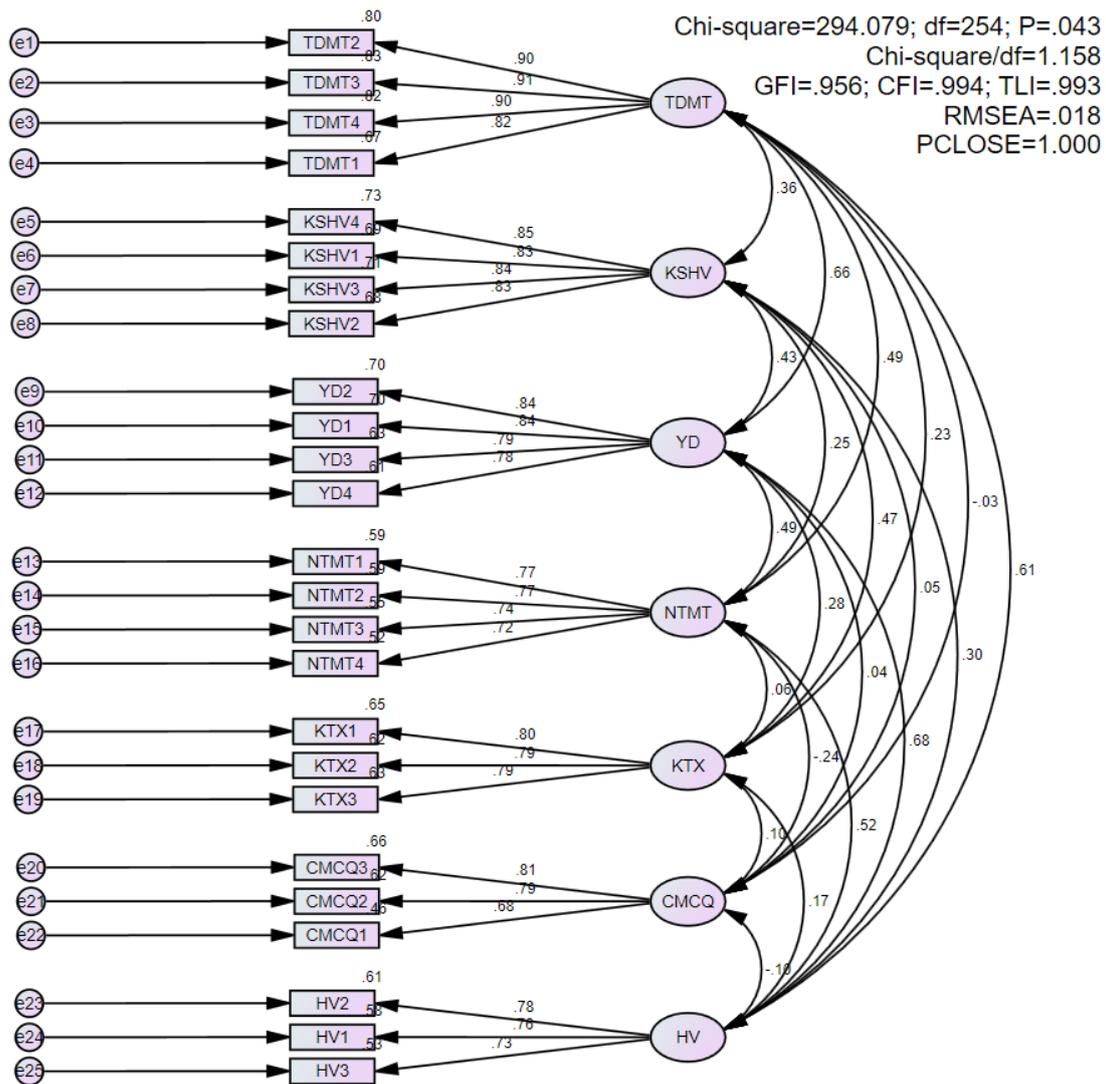### 4.1. Descriptive Statistics

The demographic analysis of 495 valid responses reveals a diverse profile of individual customers in Thu Duc City.

- Gender: Female respondents represent the majority at 62.4% (309 participants), compared to 37.6% (186 participants) for males.

- Age: The dominant age group is 29 to 36 years old, accounting for 70.3% of the sample, reflecting a segment with stable careers and high digital banking engagement.

- Education: Over 75% of the participants possess a college or university degree, indicating a high level of financial literacy and receptiveness to complex products like green banking.

- Usage Frequency: Approximately 52.3% of respondents interact with banking services daily, while 45.3% engage several times per week.

4.2. Measurement Model: CFA Results

The Confirmatory Factor Analysis (CFA) was conducted to verify the reliability and validity of the measurement scales.

- Reliability: All constructs achieved a Cronbach's Alpha between 0.799 and 0.933. The Composite Reliability (CR) for all factors exceeded 0.80, well above the 0.7 threshold.

- Convergent Validity: All Standardized Loading Estimates were above 0.678. The Average Variance Extracted (AVE) for all constructs ranged from 0.564 to 0.780, exceeding the required 0.5 limit.

- Discriminant Validity: The correlations between constructs were significantly different from 1.0 ($p < 0.05$), confirming that the scales are distinct from one another.

Chi-square=294.079; df=254; P=.043
Chi-square/df=1.158
GFI=.956; CFI=.994; TLI=.993
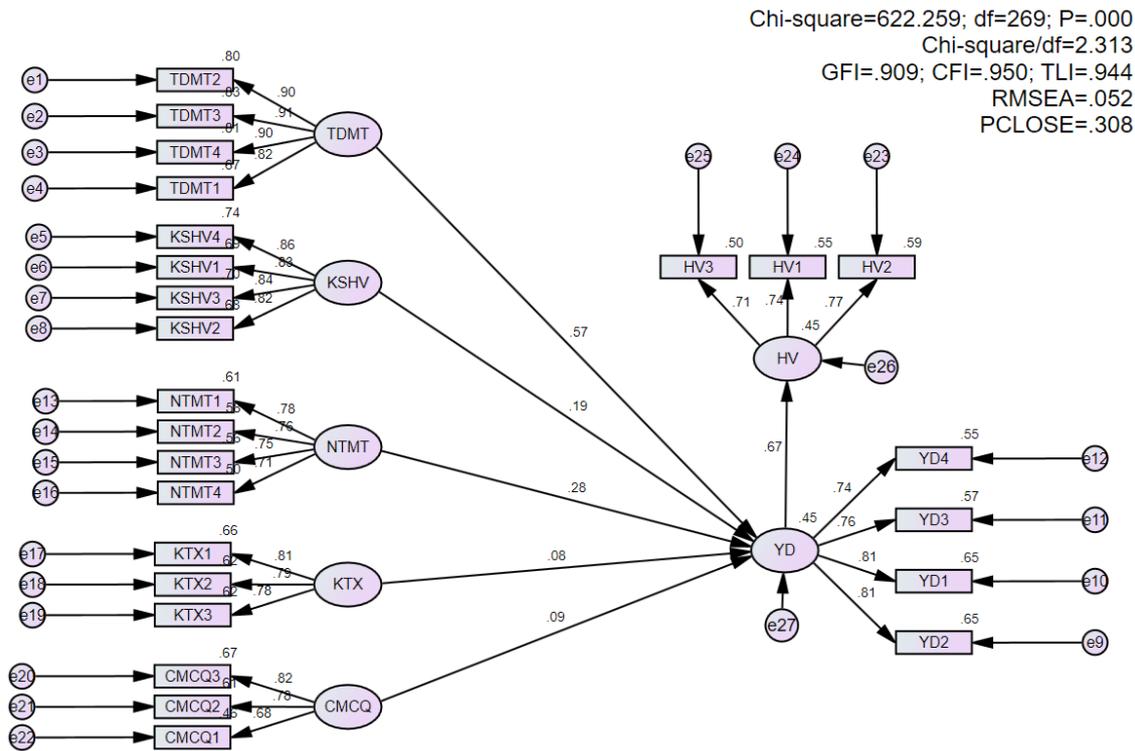RMSEA=.018
PCLOSE=1.000

4.3. Structural Model: SEM Fit Indices

The Structural Equation Modeling (SEM) results demonstrate that the proposed model fits the empirical data exceptionally well.

- Relative Chi-square (CMIN/df): 2.313, which is below the acceptable threshold of 3.0.

- Model Fit Indices: GFI = 0.909, CFI = 0.950, and TLI = 0.944, all of which meet or exceed the 0.9 benchmark for a good fit.

- Error Index: RMSEA = 0.052, falling well within the "good fit" range of below 0.08.

Chi-square=622.259; df=269; P=.000
Chi-square/df=2.313
GFI=.909; CFI=.950; TLI=.944
RMSEA=.052
PCLOSE=.308

4.4. Hypothesis Testing

The SEM analysis confirms that all six hypotheses are statistically significant and supported (p < 0.05).

Hypothesis	Path	β (Std.)	P-value	Result
H1	Green Product Knowledge -> Intention	0.084	0.000	Supported
H2	Environmental Attitude -> Intention	0.568	0.000	Supported
H3	Subjective Norm -> Intention	0.085	0.000	Supported
H4	Environmental Awareness -> Intention	0.276	0.000	Supported
H5	Perceived Behavioral Control -> Intention	0.192	0.000	Supported
H6	Usage Intention -> Usage Behavior	0.667	0.000	Supported

The results indicate that Environmental Attitude (beta = 0.568) is the most influential driver of intention, while Usage Intention acts as a powerful predictor for actual Usage Behavior (beta = 0.667).

5. DISCUSSION

The empirical results provide a comprehensive understanding of the psychological and cognitive drivers behind green banking adoption among individual customers in Thu Duc City.

The Dominant Role of Environmental Attitude

Consistent with the findings of Yadav & Pathak (2016), this study confirms that Environmental Attitude (ATT) is the most significant predictor of usage intention (beta = 0.568). This suggests that when customers develop a pro-environmental mindset, perceiving green banking not just as a financial service but as a tool for environmental preservation, their willingness to adopt these services increases exponentially. In the specific context of Vietnam, this strong correlation reflects a growing "green awareness" among the urban middle class, who are increasingly conscious of climate change impacts on their daily lives.

Knowledge and Social Influence

The positive impact of Green Product Knowledge (GPK) (beta = 0.084) aligns with Wang et al. (2014), reinforcing the idea that "to use, one must first understand." However, the relatively low path coefficient compared to Attitude suggests that while knowledge is a necessary "entry barrier," it is not the primary motivator. Similarly,

the influence of Subjective Norm (SN) (beta = 0.085) mirrors the results of Paul et al. (2016), indicating that social pressure from family and peers still plays a role in Vietnamese culture, which is characterized by high collectivism.

Perceived Control and the Intention-Behavior Gap

The significant relationship between Perceived Behavioral Control (PBC) and Intention (beta = 0.192) indicates that the ease of use of digital banking platforms in Vietnam is a crucial facilitator. Furthermore, the strong link between Intention and Usage Behavior (beta = 0.667) proves that for green banking, the "intention-behavior gap" is relatively narrow. Once a Vietnamese customer is convinced of the benefits and feels competent using the technology, they are highly likely to convert that intention into actual, frequent usage.

Contextual Differences in the Vietnamese Market

A key distinction of this study compared to Western-centric research is the heightened impact of Environmental Concern (EC) (beta = 0.276). In developing markets like Vietnam, environmental issues are often viewed through the lens of direct health impacts (air quality, water pollution). Therefore, green banking products that are marketed as part of a "sustainable lifestyle" or "responsible citizenship" resonate more deeply than those marketed solely on abstract global climate goals. Unlike developed markets where green banking is mature, the Vietnamese market is in a "transitional phase" where digital transformation and green growth are merging, making the role of technology (PBC) and education (GPK) more critical than in established economies.

6. CONCLUSION & IMPLICATIONS

6.1. Conclusion

This research successfully identified and measured the factors influencing green banking product usage among individual customers in Vietnam, specifically in the urban context of Thu Duc City. The empirical results confirm that Environmental Attitude is the most powerful driver of intention, followed by Environmental Awareness and Perceived Behavioral Control. While Green Product Knowledge and Subjective

Norms also play significant roles, their impact is comparatively moderate. Crucially, the study demonstrates that a strong Usage Intention is a vital prerequisite that directly translates into actual Usage Behavior, such as the adoption of paperless transactions and digital banking services.

6.2. Theoretical Implications

This study provides several key contributions to the existing body of knowledge:

- Extension of the TPB Model: By successfully integrating "Green Product Knowledge" and "Environmental Awareness" into the Theory of Planned Behavior, the research offers a more comprehensive framework for understanding behavior toward intangible financial services rather than just physical green goods.

- Contextualization for Emerging Markets: It fills a significant literature gap by providing empirical evidence from Vietnam, clarifying how cultural and developmental factors, such as the transition to a digital economy, shape green consumption in a developing financial sector.

- Systematization of Green Banking Theory: The research systematizes foundational theories (TRA and TPB) and applies them specifically to modern banking initiatives like eco-friendly digital services and non-financial green campaigns.

6.3. Managerial Implications

Based on the empirical findings, the following strategies are recommended for Vietnamese commercial banks:

- Enhance Product Knowledge through Transparency: Banks should simplify complex green financial concepts and use diverse channels (apps, social media, and in-person consultations) to clearly explain the environmental benefits of digital services, such as CO_2 reduction from e-statements.

- Foster Emotional and Value-Based Branding: Since attitude is the primary driver, marketing campaigns should focus on building emotional connections by highlighting how a customer's individual financial choices contribute to

tangible community goals, like reforestation or clean energy funding.

- Prioritize Seamless User Experience (PBC): To improve customers' perceived control, banks must simplify the registration and usage processes for green products, ensuring they are seamlessly integrated into existing mobile banking platforms without technical or cost barriers.

- Educate on the "Environmental Impact of Finance": Banks should proactively educate the public on how the financial sector affects climate change, helping customers link their daily transactions to larger environmental consequences.

- Leverage Social Influence and Communities: Banks can activate social norms by collaborating with eco-influencers (KOLs) or organizing community events that encourage users to share their "green journey" with peers and family.

By implementing these multifaceted strategies, commercial banks can not only improve their environmental performance but also secure a competitive edge in the rapidly evolving sustainable finance market.

7. LIMITATIONS & FUTURE RESEARCH

7.1. Research Limitations

Despite achieving its primary objectives, this study possesses several limitations that should be considered when interpreting the findings:

- Geographical and Sampling Constraints: The scope of the survey was restricted to individual customers in Thu Duc City, Ho Chi Minh City. While this area represents a dynamic urban and technological hub, the results may not be fully representative of the diverse consumer behaviors across other regions of Vietnam, particularly in rural or less digitally developed areas.

- Methodological Scope: The research utilized a convenience sampling method, which may introduce certain selection biases compared to probability-based sampling. Additionally, while the extended Theory of Planned Behavior (TPB) model provided high explanatory power, it did not investigate more complex relationships, such as the role of

moderating variables like income, age, or educational level.

- Measurement of Intangible Services: Developing precise scales for green financial products remains challenging due to the intangible nature of banking services. Although the scales were adapted from reputable international sources and refined by experts, they may not yet capture the most recent and nuanced innovations in the Vietnamese green finance market.

7.2. Directions for Future Research

To address the aforementioned limitations and further enrich the understanding of green banking, the following research directions are proposed:

- Expanding Geographical Reach: Future studies should expand their scope to include a broader range of provinces and cities across Vietnam to enhance the generalizability of the findings. A comparative analysis between major urban centers and emerging rural markets could reveal significant cultural and economic disparities in green consumption.

- Integrating Comparative Institutional Perspectives: It would be highly valuable to conduct comparative studies between domestic commercial banks and foreign-invested banks in Vietnam. This could highlight how different corporate cultures and global ESG standards influence the effectiveness of green product marketing.

- Exploring Advanced Theoretical Variables: Subsequent research could integrate additional factors such as "Green Trust," "Perceived Value," or the influence of government incentive policies as moderating or mediating variables.

- Utilizing Longitudinal and Qualitative Methods: Moving beyond cross-sectional quantitative surveys, future researchers could adopt longitudinal designs or in-depth qualitative interviews to track how customer behavior evolves over time as the green banking sector matures.

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