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Delivery Services' Impact on Customer Loyalty in Vietnamese Cross-Border Fashion E-Commerce

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Abstract

Purpose: This study investigates the impact of delivery services (DS) on customer loyalty (CL) in Vietnamese cross-border fashion e-commerce (CBEC), focusing on the dual mediating roles of customer satisfaction (CS) and trust (CT). **Design/Methodology/Approach:** We conducted a quantitative survey of 668 Vietnamese consumers who purchased fashion products via CBEC platforms in the past 12 months. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0. **Findings:** DS significantly influenced CS ($\beta = 0.677$, $p < 0.001$) and CT ($\beta = 0.702$, $p < 0.001$). CS exhibited a stronger direct effect on CL ($\beta = 0.581$) than CT ($\beta = 0.264$), with both mediating the DS-CL relationship (CS: $\beta = 0.393$; CT: $\beta = 0.185$). The model explained 62.3% of the CL variance ($R^2 = 0.623$), revealing a satisfaction-dominant loyalty pathway unique to Vietnamese consumers. **Originality/Value:** This is the first study to validate a dual-mediation model in Vietnamese CBEC, contributing to the consumer behavior theory in emerging markets. **Practical Implications:** Retailers and platforms should prioritize delivery speed and reliability to enhance satisfaction and trust, driving customer retention in Vietnam's growing CBEC market.

Keywords: Cross-border E-commerce, Delivery Services, Customer Satisfaction, Customer Trust, Customer Loyalty

JEL Classification Code: L81, M31, F23, O33, L87

1. Introduction

Cross-Border E-commerce (CBEC) has emerged as a transformative force in global retail, fundamentally reshaping consumer purchasing habits and market dynamics. The fashion industry, in particular, has experienced explosive growth in this domain, driven by technological advancements, globalized supply chains, and evolving consumer preferences for international brands (Taplin et al., 2014). Vietnam, with its rapidly expanding middle class, high Internet penetration rate (over 70%), and youthful, digitally savvy population, represents a key emerging

market with immense potential for international fashion retailers. According to a 2024 report by the Vietnam E-commerce Association, the CBEC market in Vietnam is projected to reach \$7 billion by 2026, with fashion being one of the largest and fastest-growing categories.

Within this dynamic landscape, delivery services have evolved from a mere logistical function to a critical determinant of customer experience and a cornerstone of competitive strategy (Hwang & Lee, 2012). Unlike domestic e-commerce, cross-border transactions introduce significant complexities, including extended delivery timeframes, intricate customs procedures, higher shipping costs and

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heightened consumer uncertainty. These factors amplify the role of delivery services as a primary touchpoint that profoundly shapes customer perceptions, satisfaction, trust, and ultimately loyalty (Liu et al., 2023). Consequently, for retailers aiming to capture a sustainable market share in Vietnam, understanding the precise mechanisms through which delivery performance impacts long-term customer relationships is not just beneficial, but paramount.

Despite the growing recognition of the importance of delivery services, significant gaps persist in the academic literature. First, much of the existing research focuses on domestic e-commerce contexts, with limited attention paid to the unique logistical and cultural challenges inherent in cross-border transactions, especially in emerging markets such as Vietnam (Chotisarn & Phuthong, 2025). Second, while prior studies have acknowledged the roles of customer satisfaction and trust, they often examine these factors in isolation as single mediators. This overlooks the complex interplay and potentially simultaneous influence of both cognitive-based satisfaction and affect-based trust on shaping loyalty. A comprehensive framework integrating both pathways is notably absent. Third, the Vietnamese market, with its distinct cultural characteristics, such as high uncertainty avoidance and sensitivity to service reliability, remains underexplored in the CBEC literature (Chiou et al., 2002).

This study addresses these critical gaps by developing and empirically testing a dual mediation model. We investigated the relationships among delivery services, customer satisfaction, customer trust, and customer loyalty within the specific context of Vietnamese fashion CBEC. Our research aims to (1) investigate the direct effects of delivery services on both customer satisfaction and customer trust; (2) evaluate the simultaneous mediating roles of customer satisfaction and customer trust in the relationship between delivery services and customer loyalty; and (3) validate a comprehensive structural model that integrates these relationships to provide actionable insights for the Vietnamese market.

The theoretical underpinning of this study synthesizes three established frameworks. Expectation-Confirmation Theory (ECT) provides a lens to understand how delivery performance shapes satisfaction. Social Exchange Theory (SET) explains the reciprocal nature of loyalty formation resulting from positive service encounters. Finally, Commitment-Trust Theory (CTT) elucidates the crucial role of trust in building and maintaining long-term relationships in high-risk settings. By integrating these theories, this study offers a robust and nuanced understanding of the mechanisms that drive customer loyalty in CBEC.

Theoretically, this study contributes the first empirically validated dual-mediation model in the Vietnamese CBEC context, advancing the literature beyond single-mediator

frameworks. Practically, it provides retailers, platform operators, and logistics providers with a clear, evidence-based roadmap for optimizing customer retention strategies tailored to the unique characteristics of the Vietnamese market.

2. Literature Review and Theoretical Framework

2.1. Literature Review

Delivery Services in Cross-Border E-Commerce

DS plays a central role in the e-commerce value chain, encompassing key aspects such as delivery speed, packaging quality, and communication during the fulfillment process (Hwang & Lee, 2012). In CBEC, DS becomes even more critical because of longer shipping distances, complex customs processes, and increased consumer concerns over international transactions. Existing studies indicate that effective delivery significantly shapes consumer perceptions of service quality, particularly through factors such as reliability, timeliness, and the condition of products upon arrival (Liu et al., 2023). Within CBEC, the fashion industry faces distinct delivery challenges, as fashion items often require careful handling to maintain quality and accurate sizing and are associated with higher return rates than other product categories (Chotisarn & Phuthong, 2025). These complexities highlight the importance of DS as a differentiating factor in competitive CBEC markets.

Customer Trust and Satisfaction as Mediating Factors

CS, understood as the overall evaluation of consumption experiences against expectations, has been widely recognized as a key link between service performance and customer loyalty in e-commerce. Similarly, CT, defined as the belief in a retailer's honesty and reliability, is identified as another crucial factor influencing customer behavior, especially in high-risk contexts like CBEC, where concerns over product quality, delivery reliability, and after-sales support are prevalent (Morgan and Hunt 1994). Research suggests that both satisfaction and trust play mediating roles in connecting service experiences, such as delivery performance, to loyalty outcomes, though their specific impacts vary across different e-commerce settings.

The Dual-Mediation Framework and Research Gaps

Although prior studies have explored satisfaction and trust as individual mediators between service factors and loyalty, research on their combined effects within integrated frameworks is lacking. Current literature often examines these mediators separately, with limited empirical evidence

on how they interact or complement each other in influencing customer behavior (Theodorakopoulos et al., 2024). Furthermore, much of the research on DS and customer relationships focuses on domestic e-commerce in developed markets, paying insufficient attention to the unique logistical and cultural challenges of CBEC, especially in emerging economies (Chotisarn & Phuthong,

2025). This gap in the literature calls for further investigation into how satisfaction and trust jointly mediate the impact of DS on loyalty in diverse and underexplored markets. Table 1 summarizes key studies on the relationships among DS, satisfaction, trust, and loyalty in e-commerce, highlighting the limited focus on dual-mediation frameworks and applications in less-studied regions.

Table 1: Summary of Key Studies on DS and Customer Relationships

Study	Context	Key Variables	Findings	Limitations
Rodríguez et al. (2020)	Domestic e-commerce	DS → CS → CL	Strong mediation effect	Single mediator
Bazi et al. (2023)	CBEC General	DS → CT → CL	Trust mediates the relationship	Limited to the trust pathway
Nofrizal et al. (2023)	Fashion E-commerce	DS → CS, CT	Direct effects confirmed	No loyalty outcomes
Mahadevan & Joshi, 2022	Multi-country	CS, CT → CL	Both predict loyalty	No delivery service focus
Li & Chen (2024)	Fashion CBEC	DS → CL	Direct relationship	No mediation analysis

2.2. Theoretical Framework and Hypothesis Development

Building on the literature reviewed in Section 2.1, which highlights the critical role of DS, CS, and CT in e-commerce, this section establishes a theoretical foundation to explain the mechanisms underlying these relationships in the context of Vietnamese fashion CBEC.

2.2.1. Theoretical Foundation

This study integrates three complementary theoretical frameworks to elucidate the intricate relationships among DS, CS, CT, and CL in the context of Vietnamese fashion CBEC. These frameworks provide a robust foundation for understanding the mechanisms through which delivery performance influences customer perceptions and behaviors in high-uncertainty online environments.

ECT, proposed by Oliver (1980), serves as the primary lens for examining the relationship between DS and CS. ECT posits that satisfaction arises from a cognitive process in which consumers compare their pre-purchase expectations with the perceived performance of a product or service. This process involves several stages: (1) formation of initial expectations based on prior experiences or information; (2) evaluation of actual performance post-purchase; (3) confirmation or disconfirmation of expectations; and (4) resultant satisfaction or dissatisfaction, which influences future behavioral intentions (Oliver, 1980). In the context of CBEC, delivery speed, product condition upon arrival, and communication transparency are critical performance indicators that shape satisfaction. For instance, when Vietnamese consumers experience timely and reliable deliveries that align with or exceed their expectations, positive confirmation occurs, enhancing their satisfaction levels (Hwang & Lee, 2012). However, the ECT has been critiqued for its focus on cognitive evaluations, often overlooking affective dimensions such as emotional

attachment, which are particularly relevant in fashion e-commerce (Bhattacharjee, 2001). This study addresses this limitation by integrating complementary theories that account for emotional and relational factors.

SET, rooted in the work of Homans (1958) and Blau (1986), provides a framework for understanding how positive service delivery experiences foster reciprocal loyalty behaviors. SET suggests that social interactions are governed by a cost-benefit analysis in which individuals engage in relationships that maximize perceived value and mutual benefit. In the CBEC context, effective DS creates value for customers through reliability and convenience, prompting reciprocal actions, such as repeat purchases and positive word-of-mouth. For Vietnamese consumers, who often prioritize relational harmony and mutual benefit due to cultural influences, satisfactory delivery experiences can strengthen emotional bonds with retailers, fostering long-term loyalty (Mai et al., 2003). Unlike ECT, SET emphasizes the relational and reciprocal nature of interactions and offers a broader perspective on loyalty formation. However, SET has been criticized for its assumption of rational decision-making, which may not fully capture the impulsive or hedonic behaviors common in fashion purchases (Cropanzano & Mitchell, 2005).

CTT, developed by Morgan and Hunt (1994), explains the pivotal role of trust in sustaining long-term customer relationships, particularly in high-uncertainty environments such as CBEC. CTT posits that trust and commitment are central mediators in relationship marketing, with trust acting as a precursor to both commitment and loyalty. Trust is built through consistent positive interactions that demonstrate retailer reliability, benevolence, and competence—qualities often signaled by dependable DS (Morgan & Hunt, 1994). In Vietnamese fashion CBEC, where physical distance and cross-border risks amplify uncertainty, reliable DS serve as trust-building mechanisms by reducing perceived risks and showcasing operational excellence (Chotisarn & Phuthong,

2025). CTT highlights specific antecedents of trust, such as shared values, communication, and the absence of opportunistic behavior, which are particularly relevant in cross-border settings where cultural and logistical barriers exist (Hwang and Lee, 2012). However, CTT has been critiqued for its limited focus on situational factors, such as technological or market-specific challenges in CBEC, which this study aims to address by contextualizing trust in the Vietnamese market.

Rationale for Framework Selection and Comparison with Alternatives: The integration of ECT, SET, and CTT was chosen over alternative frameworks such as the Technology Acceptance Model (TAM) or SERVQUAL because of their specific relevance to the relational and experiential aspects of CBEC. While TAM focuses on technology adoption and perceived ease of use, it lacks depth in explaining post-purchase behaviors such as satisfaction and loyalty (Davis, 1989). Similarly, SERVQUAL emphasizes service quality dimensions but does not adequately address trust and relational dynamics, which are critical in cross-border contexts (Parasuraman et al., 1988). In contrast, ECT, SET, and CTT collectively provide a comprehensive lens for exploring the cognitive (satisfaction), relational (reciprocal loyalty), and affective (trust) dimensions of customer behavior. Moreover, prior studies in Vietnam have successfully applied these theories to e-commerce contexts, reinforcing their applicability (Mukherjee et al., 2007). For example, Nguyen et al. (2012) demonstrated that ECT effectively explains satisfaction in Vietnamese online retail, while Le et al. (2023) highlighted the role of trust (via CTT) in mitigating CBEC risks.

By combining these frameworks, this study offers a nuanced understanding of how DS influences CS, CT, and CL in Vietnamese fashion CBEC, addressing both cognitive and affective pathways while accounting for cultural and contextual factors unique to the market.

2.2.2. Research Model and Hypotheses

The proposed research model investigates both direct and indirect relationships among four key constructs: DS, CS, CT, and CL. Figure 1 illustrates the conceptual framework, positioning CS and CT as dual mediators between DS and CL.

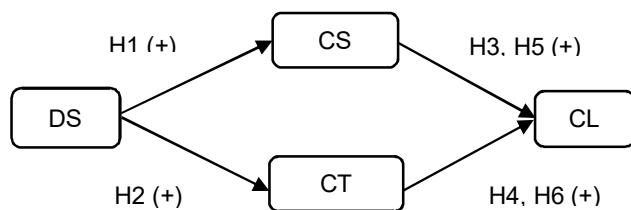


Figure 1: Conceptual Research Model

2.2.3. Immediate Impacts of Delivery Services on Customer Satisfaction and Trust

Impact on Customer Satisfaction: Drawing directly from Expectation-Confirmation Theory (ECT), this study posits that customer satisfaction is a function of comparing pre-purchase expectations with perceived service performance. In the CBEC context, when delivery services (e.g., speed, package condition) meet or exceed consumer expectations, a positive confirmation occurs, directly enhancing satisfaction (Oliver, 1980). This relationship is particularly salient among Vietnamese consumers, who exhibit high sensitivity to service quality variations (Lin et al., 2007). Therefore, we hypothesize:

H1: Delivery services exert a positive direct influence on customer satisfaction in the Vietnamese fashion CBEC.

Impact on Customer Trust: In line with Commitment-Trust Theory (CTT), trust is cultivated through consistent and reliable interactions that reduce uncertainty and demonstrate a partner's dependability (Morgan & Hunt, 1994). In the high-risk environment of CBEC, dependable delivery services act as a powerful signal of the retailer's competence and benevolence. By consistently fulfilling promises, retailers build the trust necessary for customers to engage in future transactions despite the inherent risks (Chotisarn & Phuthong, 2025). Thus, we propose:

H2: Delivery services have a positive direct influence on customer trust in Vietnamese fashion CBEC.

2.2.4. The Impact of Satisfaction and Trust on Loyalty

Impact of Customer Satisfaction on Loyalty: Based on Social Exchange Theory (SET), when customers receive benefits (i.e., a satisfying experience) from a relationship, they feel obligated to reciprocate. In a commercial context, this reciprocation manifests as loyalty behaviors, such as repeat purchases and positive word-of-mouth (Homans, 1958). A satisfying delivery experience is a significant benefit that fosters favorable attitudes and strengthens the customer's intention to continue the relationship. Accordingly, we hypothesized that:

H3: Customer satisfaction has a direct positive influence on customer loyalty in the Vietnamese fashion CBEC.

Impact of Customer Trust on Loyalty: Commitment-Trust Theory (CTT) explicitly states that trust is the cornerstone of relational commitment, which in turn leads to loyalty. Trust mitigates perceived risk and creates confidence in the retailer's future performance, making the customer willing to remain in the relationship (Morgan & Hunt, 1994). In the uncertain context of CBEC, trust is essential for overcoming barriers and fostering long-term loyalty to the brand. Therefore, we hypothesize that:

H4: Customer trust positively influences customer loyalty in the context of Vietnamese fashion CBEC.

2.2.5. The Dual-Mediation Effects of Customer Satisfaction and Customer Trust

Mediation Role of Customer Satisfaction: Integrating ECT and SET, we argue that the effect of delivery services on loyalty is not just direct but is channeled through satisfaction. A positive delivery experience (performance) leads to satisfaction (cognitive/affective evaluation), which fosters loyalty (reciprocal behavior). Therefore, satisfaction is a crucial mechanism that translates a positive operational outcome into a relational one.

H5: Customer satisfaction mediates the relationship between delivery services and customer loyalty in Vietnamese fashion CBEC.

Mediation Role of Customer Trust: Similarly, drawing from CTT, reliable delivery services are an antecedent to trust, and trust is an antecedent of loyalty. Therefore, trust is a critical mediator. Dependable delivery builds customer confidence (trust), and this trust ultimately solidifies a long-term loyal relationship, especially in a high-risk setting like CBEC.

H6: Customer trust mediates the relationship between delivery service and customer loyalty in Vietnamese fashion CBEC.

2.2.6. Research Gap, Summary of Hypotheses, and Expected Findings

As identified in Section 2.1, key gaps exist in the literature regarding the dual-mediation effects of CS and CT in CBEC, especially in emerging markets and specific industries, such as fashion. This study addresses these gaps by proposing a dual-mediation model tailored to the Vietnamese fashion CBEC context, as reflected in the hypotheses (H1-H6) summarized below.

Despite the growing body of literature on CBEC, significant gaps remain in our understanding of the interplay between DS, CS, CT, and CL within specific cultural and industry contexts. First, while DS has been widely studied in domestic e-commerce, its role in shaping customer perceptions in CBEC—where logistical and cultural complexities are amplified—remains underexplored, particularly in emerging markets such as Vietnam (Hwang & Lee, 2012). Second, the dual mediation effects of CS and CT in linking DS to CL have received limited attention, with most studies focusing on direct effects or single mediators, thus overlooking the combined cognitive and affective pathways (Punyatoya et al., 2018). Third, the fashion sector, characterized by hedonic and experiential consumption, faces specific difficulties and opportunities in CBEC.

However, few studies have examined these dynamics in the Vietnamese context, where cultural values and consumer expectations differ markedly from those in Western markets. This study addresses these gaps by proposing a comprehensive dual-mediation model tailored to Vietnamese fashion CBEC, contributing to both theoretical and practical understanding of customer behavior in cross-border settings.

This study anticipates several key findings regarding the interrelationships among DS, CS, CT, and CL in Vietnamese CBEC. First, DS is expected to have significant positive direct effects on both CS (H1) and CT (H2), with a stronger impact on satisfaction due to the immediate experiential nature of delivery interactions, as supported by ECT (Hwang & Lee, 2012). Second, both CS (H3) and CT (H4) are predicted to exert positive direct influences on CL, with trust likely having a more substantial effect in cross-border settings because of its role in reducing uncertainty, consistent with CTT (Chotisarn & Phuthong, 2025). Third, the mediation analyses are expected to reveal that CS (H5) and CT (H6) significantly mediate the relationship between DS and CL, with satisfaction demonstrating partial mediation and trust exhibiting complementary mediation effects, reflecting both cognitive and affective mechanisms (Dahiyat et al., 2011).

The dual-mediation model is anticipated to explain a substantial proportion of the variance in CL ($R^2 > 0.60$), emphasizing the value of both cognitive and affective pathways in Vietnamese fashion CBEC scenarios. This expectation is grounded in prior studies in Asian markets, where integrated models of satisfaction and trust have consistently accounted for high explanatory power in loyalty outcomes (Rane et al., 2024). Additionally, this study posits that the satisfaction-mediated pathway may be more prominent for the hedonic aspects of fashion products, driven by emotional gratification, while the trust-mediated pathway could be more critical for the utilitarian elements of DS, such as reliability and risk reduction. Vietnamese cultural traits, such as high uncertainty avoidance and collectivism, likely influence these differential effects by prioritizing trust in transactions (Hwang & Lee, 2012). By testing these predictions, this study aims to offer nuanced insights into the mechanisms driving loyalty in CBEC, addressing inconsistencies in prior research and providing actionable implications for retailers targeting the Vietnamese market.

3. Research Methodology

3.1. Research Design and Approach

This study adopts a quantitative research design

employing a cross-sectional survey methodology to investigate the relationships among DS, CS, CT, and CL in the context of Vietnamese fashion CBEC. The quantitative approach was selected for its ability to facilitate statistical testing of the proposed hypotheses (H1-H6) and to generate generalizable findings regarding the dual-mediation framework involving CS and CT. This methodological choice aligns with prior studies in e-commerce that have successfully utilized quantitative designs to validate the theoretical models (Rodríguez et al., 2020). Additionally, a cross-sectional data collection strategy was employed, which allowed for an efficient examination of the relationships among constructs at a specific point in time. This approach is deemed appropriate for testing the proposed theoretical model, as it captures the snapshot perceptions and behaviors of Vietnamese CBEC consumers, although it may limit the ability to infer causality over time (Saunders et al., 2016). To mitigate this limitation, the study focuses on recent purchase experiences to enhance the relevance and accuracy of responses.

3.2. Population and Sampling

The target population for this study consists of Vietnamese consumers who have purchased fashion products through CBEC platforms within the past 12 months. This timeframe is chosen to ensure that respondents' experiences are recent enough for accurate recall while maintaining relevance to current CBEC trends and delivery practices. A 12-month period also aligns with prior research on consumer behavior in online retail, balancing memory accuracy with sufficient sample eligibility (Bazi et al., 2023).

To select participants, the study employs a combination of purposive sampling and snowball sampling techniques. Purposive sampling is used to identify respondents who meet specific criteria relevant to the research context, ensuring that participants have direct experience with cross-border fashion purchases. Snowball sampling is subsequently applied to expand the sample size by leveraging referrals from initial respondents, which is particularly effective in reaching digitally active CBEC consumers through social networks (Hair et al., 2019). Based on the requirements of structural equation modeling (SEM) and adhering to Hair et al.'s (2019) guidelines for a minimum sample size of 10-15 respondents per parameter, the study sets a minimum sample size of 300 respondents. However, a target of 400 respondents is established to ensure adequate statistical power and to account for potential incomplete or invalid responses.

The sampling criteria were as follows: (1) Vietnamese nationality and current residence in Vietnam, ensuring cultural and contextual relevance; (2) aged 18 years or older, to comply with ethical considerations and legal consent requirements; (3) having made at least one fashion product purchase from an international online retailer via CBEC

platforms within the past 12 months, to confirm relevant experience; and (4) willingness to participate voluntarily, adhering to ethical research standards (Mahadevan & Joshi, 2022). These criteria collectively ensure that the sample is representative of the target population and relevant to the study's objectives while maintaining ethical integrity.

3.3. Data Collection Procedure

Data were collected through an online survey administered using Google Forms, a widely accessible and user-friendly platform. The survey was distributed via multiple channels, including social media platforms (e.g., Facebook and Zalo), e-commerce forums, and university student and alumni networks in Vietnam. The online approach is particularly suitable for this study because Vietnamese CBEC consumers are typically digitally active and accustomed to online interactions, which enhances response rates and accessibility (Suhartanto et al., 2019). The survey distribution was planned for four weeks to allow sufficient time to achieve the target sample size and ensure demographic diversity in terms of age, gender, and geographic location within Vietnam.

The survey instrument was designed with two main sections: (1) screening questions to verify respondent eligibility based on the defined sampling criteria and (2) measurement scales for the four key constructs (DS, CS, CT, and CL). To improve the accuracy and specificity of the responses, respondents were instructed to reflect on their most recent cross-border fashion purchase experience when completing the questionnaire. This approach minimizes recall bias by anchoring responses to a specific, memorable transaction rather than general perceptions, a method supported by previous studies in consumer behavior (Bazi et al., 2023). Additionally, to encourage participation and ensure data quality, the survey is kept concise (estimated completion time of 10-15 minutes), and anonymity is assured to address privacy concerns.

3.4. Measurement Scales

All constructs in this study were measured using established scales adapted from prior research, with modifications to ensure relevance to the Vietnamese fashion CBEC context. The scales were selected based on their proven reliability and validity in similar e-commerce studies and tailored to reflect cultural nuances and specific aspects of cross-border transactions.

DS: Measured using a 3-item scale adapted from Rodríguez et al. (2020), focusing on key dimensions such as delivery speed, product condition upon arrival, communication transparency, tracking availability, on-time

delivery, and overall reliability. These items capture the multifaceted nature of DS in CBEC, which is critical in high-uncertainty environments.

CS: Assessed using a 3-item scale adapted from Fornell (1992), covering overall satisfaction, fulfillment of expectations, comparison to ideal service, and emotional contentment with the purchase experience. This scale aligns with the ECT framework employed in this study.

CT: Evaluated using a 5-item scale from Rita et al. (2019), addressing perceptions of retailer reliability, confidence in transaction security, benevolence, integrity, and dependability. These items reflect the trust-building mechanisms central to the CTT in cross-border settings.

CL: Measured using a 4-item scale adapted from Li and Chen (2024), focusing on behavioral intentions such as repurchase likelihood, willingness to recommend the retailer, positive word-of-mouth, and preference over competitors. This scale captures both the attitudinal and behavioral dimensions of loyalty.

All measurement items were rated on a 7-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7), allowing for sufficient variation in responses and enabling nuanced statistical analysis. To ensure linguistic equivalence and cultural appropriateness for Vietnamese respondents, the survey items were translated from English to Vietnamese using a back-translation procedure. This process involved initial translation by a bilingual expert, followed by independent back-translation to English by another expert and reconciliation of discrepancies to ensure accuracy and cultural fit (Nofrizal et al., 2023). A pilot test with 30 respondents is also conducted before full-scale data collection to refine question wording, assess comprehension, and confirm scale reliability.

3.5. Data Analysis Plan

Data analysis followed a systematic two-stage approach using SPSS 28.0 and SmartPLS 3.0 software, selected for their robust capabilities in handling survey data and SEM. In the first stage, preliminary analyses were conducted using SPSS 28.0 to evaluate data quality. This included descriptive statistics to summarize respondent demographics and construct scores, as well as checks for normality (using skewness and kurtosis), outliers (using Mahalanobis distance), and missing data (handled via mean substitution or listwise deletion if minimal). The reliability and validity of the measurement scales were assessed using Cronbach's alpha (target > 0.7), composite reliability (CR > 0.7), and average variance extracted (AVE > 0.5) to ensure internal consistency and convergent validity (Hair et al.,

2019).

In the second stage, PLS-SEM was employed using SmartPLS 3.0 to simultaneously test the measurement model (confirming construct validity) and the structural model (testing hypothesized relationships). PLS-SEM was chosen over covariance-based SEM because of its suitability for exploratory research, flexibility with smaller sample sizes, non-normal data distributions, and ability to handle complex models with multiple mediators (Hair et al., 2019). This approach is particularly appropriate for this study, given the dual mediation framework and the emerging nature of CBEC research in Vietnam. Hypothesis testing for direct effects (H1-H4) and mediation relationships (H5-H6) was conducted using bootstrapping procedures with 5,000 subsamples to generate robust confidence intervals and p-values for statistical inference. Mediation effects were assessed using the Variance Accounted For (VAF) approach, where VAF values above 20% indicate partial mediation and values above 80% suggest full mediation (Hair et al., 2019). Additionally, the study evaluates the model's explanatory power through R² values for endogenous constructs (CS, CT, CL) and predictive relevance via Q² values using blindfolding procedures.

To ensure robustness, potential common method bias (CMB) was addressed by incorporating procedural remedies (e.g., anonymity assurance and temporal separation of constructs in the survey) and statistical checks (e.g., Harman's single-factor test and marker variable technique) during the analysis (Podsakoff et al., 2003). These steps collectively enhance the validity and reliability of the findings, ensuring that the results accurately reflect the relationships among DS, CS, CT, and CL in the Vietnamese fashion CBEC context.

4. Research Results

This section presents the findings derived from the empirical data analysis conducted using PLS-SEM with SmartPLS software (version 3.0) (Ringle et al., 2015). The analysis followed the two-step procedure recommended by Hair et al. (2017), beginning with the measurement model assessment, followed by the structural model evaluation.

4.1. Sample Characteristics

A total of 742 responses were collected, of which 668 were retained after data cleaning and quality checks (response rate: 90.0%). Table 2 presents the demographic profiles of the final sample population.

Table 2: Sample Demographics (N = 668)

Characteristic	Category	Frequency	Percentage
Gender	Male	267	40.0%
	Female	401	60.0%
Age	18-25	198	29.6%
	26-30	201	30.1%
	31-35	156	23.4%
	36-45	113	16.9%
Education	High School	89	13.3%
	Bachelor's	445	66.6%
	Master's/PhD	134	20.1%
Monthly Income (USD)	<\$300	134	20.1%
	\$300-\$600	267	40.0%
	\$600-\$1000	178	26.6%
	>\$1000	89	13.3%
Location	Ho Chi Minh City	267	40.0%
	Hanoi	201	30.1%
	Other major cities	134	20.1%
	Rural areas	66	9.8%
CBEC Platform	Shopee	517	77.4%
	TikTok Shop	105	15.7%
	Lazada	46	6.9%
Shopping Frequency	Monthly	334	50.0%
	Quarterly	234	35.0%
	Semi-annually	100	15.0%

A total of 742 responses were collected, of which 668 were retained following data cleaning and quality assurance procedures, yielding a 90.0% response rate. The final sample demonstrated balanced demographic characteristics representative of the Vietnamese CBEC fashion consumer segment. Sex distribution revealed a female majority (60.0%) compared to males (40.0%), while the age distribution was predominantly within the 18-35 years cohort (83.1%). The educational attainment is primarily at the tertiary level, with 66.6% holding bachelor's degrees, and the income distribution centers around the middle-income bracket (\$300-\$600 USD monthly, 40.0%). Geographic concentration was evident in major metropolitan areas, including Ho Chi Minh City (40.0%) and Hanoi (30.1%). Platform preference analysis indicated Shopee's market dominance (77.4%), with purchasing frequency patterns indicating regular engagement through monthly transactions (50.0%). These demographic characteristics align with the established profiles of Vietnamese e-commerce consumers, comprising young, educated, middle-income individuals with frequent online shopping behaviors, thereby validating the sample's representativeness for cross-border fashion retail research.

4.2. Measurement Model Evaluation

The initial phase involved a rigorous assessment of the psychometric properties of the measurement model,

including indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

Indicator Reliability: Assessed via outer loadings (Table 3), all individual item loadings surpassed the recommended threshold of 0.70 (Hair et al., 2017). The loadings ranged from 0.844 (CT2) to 0.895 (DS1), confirming that each indicator reliably measured its intended latent construct.

Table 3: Outer Loadings

Indicator	CL	CS	CT	DS
CL1	0.889			
CL2	0.894			
CL3	0.882			
CS1		0.880		
CS2		0.866		
CS3		0.887		
CT1			0.875	
CT2			0.844	
CT3			0.870	
CT4			0.872	
CT5			0.858	
DS1				0.895
DS2				0.872
DS3				0.879

Internal Consistency Reliability: Evaluated using Cronbach's Alpha and Composite Reliability (CR), the results (Table 4) demonstrated strong internal consistency for all constructs. Cronbach's alpha values ranged from 0.851 (CS) to 0.915 (CT), and CR scores ranged from 0.910 (CS) to 0.936 (CT). All values exceeded the 0.70 benchmark (Hair et al., 2017; Nunnally & Bernstein, 1994), confirming the scale's reliability.

Convergent Validity: Confirmed by examining the AVE (Table 4). The AVE values for CL, 0.771 for CS, 0.746 for CT, and DS were 0.789, 0.771, 0.746, and 0.778 for DS. As all the values substantially surpassed the minimum threshold of 0.50 (Fornell, adequate convergent validity was established (Hair et al. 2017; Fornell and Larcker 1981).

Table 4: Construct Reliability and Validity

Latent variable	Cronbach's Alpha	rho_A	Composite reliability	AVE
CL	0.867	0.867	0.918	0.789
CS	0.851	0.851	0.910	0.771
CT	0.915	0.915	0.936	0.746
DS	0.857	0.859	0.913	0.778

Discriminant Validity: Assessed to ensure that each construct was empirically distinct. The Fornell-Larcker criterion (Table 5) showed that the square root of the AVE for each construct (diagonal values) was greater than its correlation with any other construct (off-diagonal values), satisfying this criterion.

Table 5: Fornell-Larcker Criterion

	CL	CS	CT	DS
CL	0.888			
CS	0.767	0.878		
CT	0.674	0.706	0.864	
DS	0.638	0.677	0.702	0.882

Note: Diagonal values are the square roots of AVE.

4.3. Structural Model Evaluation

Following the validation of the measurement model, the structural model was assessed to test the hypothesized relationships and evaluate the model's predictive capabilities.

Collinearity Assessment: Potential multicollinearity among the predictor constructs was examined using the Variance Inflation Factor (VIF). All VIF values ranged from 1.960 (CS2) to 2.783 (CT1). As all values were substantially below the common threshold of 5 (Hair et al., 2017), multicollinearity was not a concern.

Explanatory Power (R²): The coefficient of determination (R²) was assessed to determine the variance explained by the endogenous constructs (Table 6). DS explained 45.9% of the variance in CS (R² = 0.459) and 49.3% of the variance in CT (R² = 0.493). Collectively, DS, CS, and CT accounted for 62.3% of the variance in CL (R² = 0.623).

Table 6: Coefficient of Determination (R² and Adjusted R²)

Endogenous Construct	R ²	Adjusted R ²
CS	0.459	0.457
CT	0.493	0.491
CL	0.623	0.621

Hypothesis Testing (Path Coefficients): A bootstrapping procedure with 5,000 resamples was performed to assess the significance of the hypothesized paths. Table 7 presents the results of the direct effects.

Table 7: Results of Hypothesis Testing (Direct Effects)

Hypothesis	Path	β	t-value	p-value	f ²	Effect Size	Support
H1	DS → CS	0.677	21.114	0.000	0.848	Large	Supported
H2	DS → CT	0.702	23.375	0.000	0.972	Large	Supported
H3	CS → CL	0.581	11.994	0.000	0.448	Large	Supported
H4	CT → CL	0.264	5.510	0.000	0.092	Small to Medium	Supported

Mediation Analysis: The mediating roles of CS (H5) and CT (H6) were investigated by examining the significance of

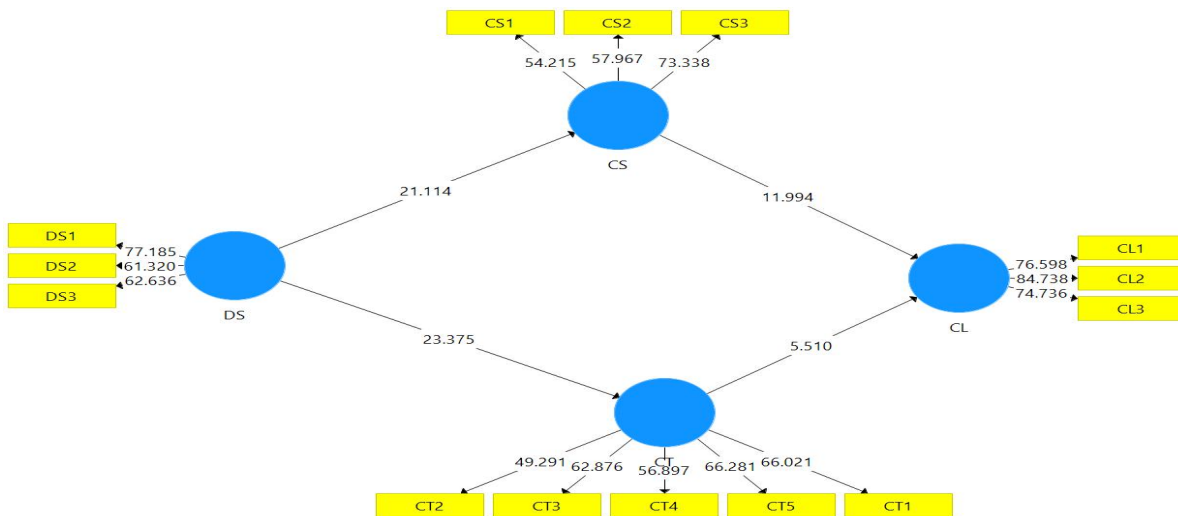
specific indirect effects via bootstrapping. The results are presented in Table 8.

Table 8: Mediation Analysis Results (Indirect Effects)

Hypothesis	Indirect Path	β	t-value	p-value	95% BC Bootstrap CI	Mediation Supported
H5	DS → CS → CL	0.393	9.395	0.000	[0.301, 0.465]	Yes
H6	DS → CT → CL	0.185	5.046	0.000	[0.119, 0.267]	Yes

The significant total indirect effect ($\beta = 0.578, p < 0.001$) underscores that the influence of DS on CL is substantially

channeled through both CS and CT. The results of the complete structural model are shown in Figure 2.



Note: Significance level: *** $p < 0.001$

Figure 2: Research Model with PLS-SEM Results

4.4. Model Fit Assessment

Although PLS-SEM does not provide traditional goodness-of-fit indices, such as covariance-based SEM, several criteria have been employed to assess model quality. The Standardized Root Mean Square Residual (SRMR) value of 0.061 was below the threshold of 0.08, indicating an acceptable model fit (Henseler et al., 2014). The Normed Fit Index (NFI) of 0.847 approached the recommended value of 0.90, suggesting a reasonable model fit given the complexity of structural relationships.

Predictive Relevance (Q^2): The Stone-Geisser's Q^2 values were calculated using the blindfolding procedure to assess the model's predictive relevance. All endogenous constructs demonstrated positive Q^2 values: CS ($Q^2 = 0.347$), CT ($Q^2 = 0.361$), and CL ($Q^2 = 0.481$), confirming that the model had satisfactory predictive relevance (Hair et al., 2017).

The results confirm all six hypotheses, demonstrating that DS significantly influences CS and CT, which in turn mediate the relationship with CL in Vietnamese fashion CBEC. Notably, CS exhibits a stronger direct and mediating effect on loyalty compared to trust, suggesting a unique satisfaction-dominant pathway. The structural model explains 62.3% of the variance in CL ($R^2 = 0.623$), indicating strong predictive power. These findings lay the foundation for a detailed discussion of the theoretical and practical implications in the following section.

5. Discussion and Implications

5.1. Key Findings and Interpretations

The empirical results of this study provide strong support for the proposed dual-mediation model, confirming all six hypotheses (H1-H6) concerning the relationships among DS, CS, CT, and CL within the Vietnamese CBEC context for fashion products. Specifically, DS exhibited significant positive direct effects on both CS ($\beta = 0.677$, $p < 0.001$) and CT ($\beta = 0.702$, $p < 0.001$), thereby validating H1 and H2, respectively. These findings are consistent with prior research that underscores the critical role of delivery performance in shaping customer perceptions of online shopping environments (Rodríguez et al., 2020; Bazi et al., 2023). The slightly stronger effect of DS on CT than that of CS suggests that Vietnamese consumers may prioritize reliability and risk mitigation in cross-border transactions. This difference could be attributed to cultural characteristics, such as high uncertainty avoidance, which drives a greater need for dependable delivery to reduce perceived risks in international purchases (Hofstede, 2001).

Moreover, CS demonstrated a more pronounced direct effect on CL ($\beta = 0.581$, $p < 0.001$) than CT ($\beta = 0.264$, $p < 0.001$), supporting H3 and H4 and revealing a satisfaction-dominant pathway to loyalty among Vietnamese CBEC consumers. This result diverges from findings in other CBEC contexts, where trust often plays a more dominant role due to heightened perceived risks associated with cross-border transactions (Mahadevan & Joshi, 2022). The prominence of satisfaction in driving loyalty in this study can likely be attributed to the hedonic nature of fashion purchases, where immediate experiential fulfillment—such as receiving products in excellent condition and on time—outweighs the inability to physically evaluate items before purchase (Yulian et al., 2022). This suggests that Vietnamese consumers may prioritize emotional and functional satisfaction over trust when forming loyalty to CBEC retailers.

The mediation analysis further substantiated the significant indirect effects of both CS ($\beta = 0.393$, $p < 0.001$) and CT ($\beta = 0.185$, $p < 0.001$) on the relationship between DS and CL, thereby confirming H5 and H6. The strong mediating role of satisfaction highlights its pivotal function in translating positive delivery experiences into sustained loyalty outcomes. Collectively, CS and CT mediated 62.3% of the total effect of DS on CL, with the structural model demonstrating substantial explanatory power ($R^2 = 0.623$). This dual mediation effect validates the integrated theoretical framework proposed in this study and underscores the nuanced interplay between cognitive (satisfaction) and affective (trust) pathways in fostering loyalty in emerging market CBEC contexts such as Vietnam. Compared to prior studies that often adopt single-mediator models (e.g., Rodríguez et al., 2020), these findings offer a more comprehensive perspective on how DS influences long-term customer relationships in the Vietnamese fashion CBEC market.

5.2. Theoretical Contributions

This study makes several noteworthy theoretical contributions to the literature.

First, and most significantly, it advances the customer relationship literature by proposing and empirically validating a dual-mediation framework in the CBEC context. By demonstrating the simultaneous and complementary roles of customer satisfaction (a cognitive-affective evaluation) and customer trust (a relational belief), this study moves beyond the more simplistic single-mediator models that have dominated prior studies (e.g., Bazi et al., 2023; Rodríguez et al., 2020). Our findings provide a more holistic and nuanced understanding of the mechanisms through which operational performance translates to customer loyalty.

Second, this study enriches the application of

foundational theories (ECT, SET, CTT) to the complex, high-uncertainty environment of CBEC in emerging markets. This confirms that ECT is robust in explaining satisfaction formation via delivery performance, whereas SET effectively frames loyalty as a reciprocal response to satisfying experiences. Crucially, it reinforces CTT by highlighting reliable delivery as a potent trust-building mechanism that mitigates the perceived risks inherent in cross-border transactions.

Third, it contributes Vietnamese-specific insights into consumer behavior, challenging the Western-centric assumptions prevalent in much e-commerce literature. The key finding of a satisfaction-dominant pathway to loyalty (where satisfaction's effect on loyalty is substantially stronger than that of trust) suggests that for hedonic products such as fashion, Vietnamese consumers may prioritize immediate experiential gratification over the more abstract, long-term assurance of trust. This underscores the importance of contextualizing consumer behavior models within specific cultural and market settings.

5.3. Practical Implications

The findings of this study offer clear and actionable insights for retailers, platform operators, and logistics providers operating in or targeting the Vietnamese CBEC market.

Prioritize "Last-Mile" Delivery as a Core Strategic Weapon: The strong influence of delivery services on both satisfaction and trust confirms that logistics should not be viewed as a cost center but as a primary driver of customer retention. The finding that satisfaction is a more powerful driver of loyalty than trust has critical strategic implications: managers should allocate resources to what customers experience directly and immediately. This means prioritizing investments in delivery speed, ensuring that products arrive in perfect condition, providing transparent and accurate tracking, and offering proactive communication. For a tangible goal, retailers should aim for on-time delivery rates exceeding 95% and consider premium packaging, as these tangible elements directly fuel the satisfaction that leads to repeat purchases.

Adopt a Dual-Pronged Strategy for Building Relationships. Although satisfaction is dominant, trust remains a significant factor. Therefore, a dual strategy is optimal.

To Drive Satisfaction: Focus on operational excellence. This includes partnering with reliable logistics providers, optimizing warehouse-to-customer workflows, and ensuring a positive unboxing experience. These actions create immediate positive feelings among the participants.

To Build Trust: Focus on reliability and risk reduction. This involves offering clear and fair return policies,

providing delivery guarantees (e.g., compensation for significant delays), and having a responsive customer service to handle issues. These actions build a long-term sense of security in the community.

Tailor Strategies to the Vietnamese Context: Retailers on dominant platforms, such as Shopee and Lazada, must understand local expectations. This includes offering cash-on-delivery (COD) where feasible, providing customer support in Vietnamese, and being sensitive to regional logistics challenges. The satisfaction-dominant finding suggests that marketing campaigns emphasizing "fast, guaranteed, perfect delivery" may be more effective in driving loyalty than campaigns focused solely on brand heritage or abstract promises of trustworthiness.

For Logistics Providers: Positioning as a Value-Added Partner. Logistics firms should leverage these insights to offer services beyond basic transportation. By providing retailers with detailed performance analytics, real-time tracking APIs, and flexible delivery options, they can position themselves as strategic partners who directly contribute to their clients' customer loyalty and bottom line.

5.4. Limitations and Future Research

Although this study provides valuable insights, it is not without limitations. First, its cross-sectional design captures a snapshot in time and limits the ability to definitively infer causality. Future research could employ a longitudinal design to track how customer perceptions and loyalty evolve across multiple transactions. Second, this study focused on the fashion category; the relative importance of satisfaction and trust might differ for other product categories, such as electronics or high-value goods, which requires further investigation. Finally, while we focused on delivery services, other factors such as website usability, product quality, and price also influence loyalty. Future studies could integrate these variables into a more comprehensive model to explore their interactive effects.

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