

INVESTIGATING CUSTOMERS' CASH-ON-DELIVERY PAYMENT ADOPTION FOR ONLINE PURCHASES IN VIETNAM: THE MEDIATING ROLE OF PERCEIVED SECURITY

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Abstract: *This study investigates the factors influencing the adoption of the Cash on Delivery (COD) payment method among Vietnamese online shoppers. Utilizing the Technology Acceptance Model (TAM) as the theoretical framework, the research incorporates perceived trust, privacy issues avoidance, financial risk avoidance, and perceived security to understand their impact on COD adoption. Data was collected from 395 online purchasers in Vietnam through a self-administered questionnaire. The findings reveal that perceived security significantly mediates the relationship between perceived trust, privacy issues avoidance, financial risk avoidance, and the adoption of COD. These insights provide valuable implications for e-commerce businesses, policymakers, and researchers aiming to enhance consumer trust and security in online transactions.*

• Keywords: *perceived trust, privacy issues avoidance, financial risk avoidance, perceived security, cash-on-delivery.*

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1. Introduction

The e-commerce sector in Vietnam has experienced remarkable growth in recent years, particularly during the COVID-19 pandemic, driven by expanding internet infrastructure and the influx of domestic and foreign e-commerce companies. E-commerce, encompassing activities like product discovery, ordering, payment processing, and relationship building through digital technologies, has flourished due to internet commercialization (Michie, 2020; Le & Lam, 2021). The cash on delivery (COD) payment method has emerged as a key driver of this growth in Vietnam, aligning with cultural preferences for tangible transactions and addressing concerns about online payment fraud, privacy issues, and financial risks (Nguyen et al., 2020). Despite efforts by the Vietnamese government and e-commerce enterprises to promote electronic payment systems through apps and portals, many consumers still prefer COD due to its perceived security and simplicity (Le & Lam, 2021).

This study investigates the factors influencing Vietnamese online shoppers' adoption of COD, utilizing the Technology Acceptance Model (TAM) as its theoretical framework, extended to include perceived trust, privacy issues avoidance, financial risk avoidance,

and perceived security (Davis, 1986; Hien, 2023). Prior research highlights trust, perceived risk, security, privacy, and ease of use as critical determinants of payment method adoption in e-commerce (Jana, 2017; Anjum & Chai, 2020; Ilieva et al., 2022). Given Vietnam's unique socioeconomic, cultural, and governmental context, models developed in Western countries require validation in this setting. By examining how perceived security mediates the relationship between trust, privacy, and financial risk concerns and COD adoption, this study aims to provide actionable insights for e-commerce businesses, policymakers, and researchers to enhance consumer trust and security in online transactions.

2. Literature review

2.1. Theoretical framework

The theoretical framework for this study is grounded in the Technology Acceptance Model (TAM), which was developed by Davis (1986) to explain and predict user acceptance of new technologies. TAM posits that perceived ease of use and perceived usefulness are primary determinants of technology adoption (Davis, 1986). This model has been extensively utilized in various contexts, including e-commerce, to understand consumer behavior and

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adoption intentions (Hien, 2024). Additionally, this study incorporates elements of perceived security, trust, privacy issues avoidance, and financial risk avoidance into the TAM framework to better capture the factors influencing the adoption of the Cash on Delivery (COD) payment method in the context of online shopping in Vietnam. The integration of these variables is based on prior research indicating their significant impact on consumer behavior in e-commerce settings (Michie, 2020; Le & Lam, 2021; Hien 2024). This extended TAM framework provides a comprehensive model for analyzing how these factors collectively influence Vietnamese consumers' intentions to adopt COD as a payment method.

2.2. Hypotheses development

Perceived trust, privacy issues avoidance, financial risks avoidance, and perceived security are critical determinants shaping Vietnamese online shoppers' adoption of the Cash on Delivery (COD) payment method. Perceived trust reflects customers' belief that an e-commerce platform will fulfill its promises and protect their personal and financial information, thereby enhancing their sense of security and reducing concerns about fraud and privacy breaches (Ilieva et al., 2022). This trust encourages the adoption of COD, as it provides tangible assurance of product receipt before payment, aligning with consumer preferences for secure transactions (Anjum & Chai, 2020). Therefore, we propose:

H1: Perceived Trust has a positive impact on Perceived Security among customers toward online shopping behavior.

H2: Perceived Trust has a positive impact on the adoption of COD among customers toward online shopping behavior.

Privacy issues avoidance significantly influences perceived security and COD adoption. As customers become increasingly aware of risks associated with sharing personal and financial information online, their efforts to avoid privacy-compromising situations enhance their sense of stalking behavior (Ilieva et al., 2022). COD addresses these concerns by eliminating the need to share sensitive data online, allowing payment upon delivery and making it an attractive option for privacy-conscious consumers (Le & Lam, 2021). Thus, we hypothesize:

H3: Privacy Issues Avoidance has a positive impact on Perceived Security among customers toward online shopping behavior.

H4: Privacy Issues Avoidance has a positive impact on the adoption of COD among customers toward online shopping behavior.

Financial risks avoidance is another key factor, as customers seek to mitigate potential losses from fraudulent activities, receiving substandard goods, or hacking incidents (Ilieva et al., 2022). By avoiding these risks, consumers enhance their perceived security, and COD further supports this by allowing product verification before payment, reducing financial uncertainties (Nguyen et al., 2020). Accordingly, we propose:

H5: Financial Risks Avoidance has a positive impact on Perceived Security among customers toward online shopping behavior.

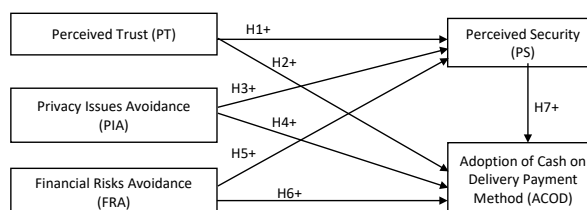
H6: Financial Risks Avoidance has a positive impact on the adoption of COD among customers toward online shopping behavior.

Perceived security, encompassing confidence in the protection of personal and financial information and the reliability of transaction processes, is pivotal in driving COD adoption, particularly in Vietnam, where concerns about online payment fraud and data breaches are prevalent (Nguyen et al., 2020). COD's structure, which allows inspection of goods before payment, minimizes financial risks and boosts trust in the transaction process (Le & Lam, 2021; Hien, 2023). Perceived security thus mediates the effects of trust, privacy concerns, and financial risks on COD adoption. We hypothesize:

H7: Perceived Security has a positive impact on the adoption of COD among customers toward online shopping behavior.

These hypotheses collectively form the research model, as depicted in Figure 1, to examine the direct and mediated effects of these factors on COD adoption among Vietnamese online shoppers.

Figure 1. Research model



3. Data and research method

3.1. Data collection and sampling

This study used a self-administered questionnaire to collect data on Cash on Delivery (COD) uptake. The questionnaire was sent to Vietnamese online buyers via Zalo, Viber, Facebook, and email to ensure broad reach and ease. Due to its efficiency and usefulness in getting data from a diverse sample quickly, convenience sampling was used (Hien, 2024; Hair et al., 2020). The demographic poll includes measures

for perceived trust, privacy issues avoidance, financial risk avoidance, perceived security, and adoption of COD. Ten online buyers pre-tested the questionnaire to guarantee clarity and relevancy, resulting in small changes for better comprehension. Between May and June, 395 surveys were completed. Based on structural equation modeling recommendations of 10 units per latent variable, this sample size was sufficient (Hair et al., 2020). SmartPLS 4 structural equation modeling (SEM) provided robust insights into Vietnam's COD adoption factors.

3.2. Data analysis

Table 1. Demographic information of the respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	202	51.1
	Female	193	48.9
Age	18-25	66	16.7
	26-35	122	30.9
	36-45	104	26.3
	46-55	90	22.8
	Over 55	13	3.3
Education Level	High school/Intermediate	50	12.7
	Undergraduation	237	60.0
	Higher Education	108	27.3
	Other	0	0.0
Monthly Income	Less than 10 milVND	68	17.2
	From 10 to less than 15 milVND	87	22.0
	From 15 to less than 20 milVND	118	29.9
	From 20 to less than 30 milVND	101	25.6
	30 milVND or above	21	5.3
TOTAL		395	100

Source: From the authors' data analysis results

This study's 395 respondents were 51.1% male and 48.9% female. The majority of responses are 26-35 years old (30.9%), followed by 36-45 (26.3%), 46-55 (22.8%), 18-25 (16.7%), and a minor percentage over 55 (3.3%). Educationally, 60.0% of respondents have an undergraduate degree, 27.3% have higher education, and 12.7% have high school or intermediate education. Monthly income, the largest group of respondents earns 15 to less than 20 million VND (29.9%), followed by 20 to less than 30 million (25.6%), 10 to less than 15 million (22.0%), less than 10 million (17.2%), and 30 million or more (5.3%). This study's Vietnamese internet shoppers' socioeconomic variety provides a complete picture.

Table 2. Reliability and discriminant validity tests

	α	CR (rho_a)	CR (rho_c)	AVE	ACOD	FRA	PIA	PS	PT
ACOD	0.925	0.927	0.944	0.771					
FRA	0.923	0.923	0.942	0.764	0.814				
PIA	0.937	0.943	0.952	0.799	0.604	0.425			
PS	0.918	0.922	0.939	0.753	0.693	0.523	0.459		
PT	0.940	0.941	0.954	0.806	0.684	0.582	0.446	0.495	

Source: From the authors' data analysis results

Table 2 shows study concept reliability and discriminant validity results. All constructs ACOD, FRA, PIA, PS, and PT had Cronbach's alpha values between 0.918 and 0.940, showing strong internal consistency and dependability. These constructions' composite

reliability values (ρ_a and ρ_c) exceeded the necessary 0.70, proving their reliability. All constructs' Average Variance Extracted (AVE) values were over 0.50, meeting convergent validity standards, ranging from 0.753 to 0.806. Discriminant validity was also indicated by each construct's square root of AVE being larger than correlations with other components. These findings show that the study's measuring scales are trustworthy and valid for analyzing Vietnamese online shoppers' Cash on Delivery payment method adoption.

3.3. Structural equation modelling

Table 3. Path coefficients

Hypothesis	Relationship	Original sample	Mean	STDEV	T statistics	P values	Result
H1	PT → PS	0.214	0.214	0.05	4.273	0	Accepted
H2	PT → ACOD	0.2	0.2	0.036	5.613	0	Accepted
H3	PIA → PS	0.231	0.231	0.04	5.721	0	Accepted
H4	PIA → ACOD	0.197	0.195	0.033	5.95	0	Accepted
H5	FRA → PS	0.276	0.278	0.046	5.952	0	Accepted
H6	FRA → ACOD	0.445	0.446	0.034	13.158	0	Accepted
H7	PS → ACOD	0.247	0.247	0.036	6.851	0	Accepted

Source: From the authors' data analysis results

Table 3 presents the coefficients of the routes, which indicate the intensity and importance of the relationships between the constructs postulated in the study. Every hypothesis has a statistically significant correlation with p-values that are less than 0.05. The relationship between Perceived Trust (PT) and Perceived Security (PS) is positive, with a path coefficient of 0.214 and a t-value of 4.273. The adoption of ACOD is favorably influenced by Perceived Trust (PT), as indicated by a path coefficient of 0.200 and a t-value of 5.613. Privacy Issues Avoidance (PIA) favorably influences Adoption of COD (ACOD) and significantly effects Perceived Security (PS) with a path coefficient of 0.231 and a t-value of 5.721. Financial Risks Avoidance (FRA) positively affects Perceived Security (PS) with a path coefficient of 0.276 and a t-value of 5.952, and it significantly affects Adoption of COD (ACOD) with 0.445 and 13.158. Perceived Security (PS) has a favorable impact on the adoption of ACOD, as indicated by a path coefficient of 0.247 and a t-value of 6.851. These findings validate all predictions, showing strong and favorable connections between Vietnamese online buyers' COD payment adoption and perceived trust, privacy concerns avoidance, financial risks avoidance, and security.

Table 4. Specific indirect effects

Relationship	Original sample	Sample mean	STDEV	T statistics	P values
PIA → PS → ACOD	0.057	0.057	0.014	3.956	0.000
FRA → PS → ACOD	0.068	0.068	0.014	4.810	0.000
PT → PS → ACOD	0.053	0.053	0.016	3.333	0.001

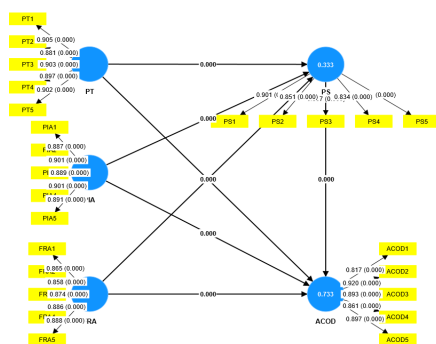
Source: From the authors' data analysis results

Table 4 provides a detailed overview of the indirect effects, emphasizing the mediation roles within the model. The correlation between PIA and ACOD through PS) is statistically significant, with

an indirect impact coefficient of 0.057 and a t-value of 3.956 ($p < 0.001$). FRA has an indirect effect on ACOD through PS, with a coefficient of 0.068 and a t-value of 4.810 ($p < 0.001$). Furthermore, the impact of PT on ACOD is mediated by PS, with an indirect effect coefficient of 0.053 and a t-value of 3.333 ($p < 0.001$).

Figure 2 depicts the route coefficients of the structural model, which were derived using Partial Least Squares Structural Equation Modeling (PLS-SEM). The diagram clearly illustrates the direct and indirect connections between the elements, verifying that all proposed pathways are both significant and positive. The diagram illustrates that Perceived Security (PS) plays a vital role as a mediating factor, amplifying the impact of Perceived Trust (PT), Privacy Issues Avoidance (PIA), and Financial Risks Avoidance (FRA) on the Adoption of COD (ACOD). These findings highlight the significance of perceived security in influencing the impact of trust, privacy, and financial risk factors on the choice for cash on delivery (COD) among Vietnamese online customers. This contributes to a thorough comprehension of the elements that drive the adoption of COD.

Figure 2. Result of PLS-SEM structural model path coefficient



Source: From the authors' data analysis results

4. Findings discussion

This study confirms that perceived security significantly mediates the adoption of the Cash on Delivery (COD) payment method among Vietnamese online shoppers. Perceived trust positively influences perceived security (path coefficient = 0.214) and COD adoption (0.200), indicating that trust in e-commerce platforms enhances security perceptions, encouraging COD use (Halaweh, 2017; Anjum & Chai, 2020). Privacy issues avoidance (PIA) and financial risks avoidance (FRA) also positively impact perceived security (path coefficients = 0.231 and 0.276, respectively) and directly affect COD adoption (0.197 and 0.445), as COD allows product inspection before payment, alleviating privacy and financial concerns (Le

& Lam, 2021; Nguyen et al., 2020). Perceived security directly drives COD adoption (0.247), underscoring its pivotal role in Vietnam's context, where online fraud concerns are prevalent. Mediation analysis reveals significant indirect effects of PIA (0.057), FRA (0.068), and perceived trust (0.053) on COD adoption through perceived security, emphasizing its mediating role. These findings provide actionable insights for e-commerce platforms to enhance trust and security, promoting COD adoption in Vietnam.

5. Implications

This study's findings highlight the critical role of perceived security in driving Cash on Delivery (COD) adoption, offering key implications for e-commerce platforms, policymakers, and researchers. E-commerce businesses should enhance consumer trust by implementing robust data protection, transparent transaction processes, and reliable customer service, alongside features like product inspection before payment and clear return policies to boost COD adoption in Vietnam's developing digital payment landscape. Policymakers should establish stringent e-commerce regulations to mitigate privacy and financial risks, mandating clear data use disclosures and fraud protections, while promoting digital literacy to empower consumers. Researchers can extend the Technology Acceptance Model (TAM) to explore additional factors like cultural influences or technological advancements affecting payment preferences, using longitudinal or comparative studies to deepen insights into secure e-commerce practices globally.

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