

Factors Influencing Cash-On-Delivery Adoption 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 users. This study utilizes the Technology Acceptance Model (TAM) as its theoretical framework, incorporating perceived trust, avoidance of privacy issues, avoidance of financial risk, and perceived security to examine their impact on the adoption of Cash on Delivery (COD). Data were collected from 395 online shoppers in Vietnam through a self-administered questionnaire. The findings demonstrate that felt security significantly mediates the relationship between perceived trust, avoidance of privacy concerns, avoidance of financial risk, and the adoption of cash on delivery (COD). These findings have substantial implications for e-commerce businesses, governmental entities, and researchers aiming to enhance customer trust and security in digital transactions.*

Keywords: *Perceived Trust, Privacy Issues Avoidance, Financial Risk Avoidance, Perceived Security, Cash-on-Delivery.*

1. INTRODUCTION

The e-commerce sector in Vietnam has experienced significant growth in recent years, particularly during the COVID-19 pandemic. The enhancement of Vietnam's internet infrastructure has drawn several domestic and foreign e-commerce companies. E-commerce, or electronic commerce, refers to the commercial process of doing transactions only through digital information technology and electronic communication. This includes activities such as product research, ordering, payment processing, and relationship development (Michie, 2020). The commercialization of the internet has led to the widespread growth of electronic commerce (Le & Lam, 2021).

Previous research by Jana (2017) and Anjum and Chai (2020) has identified trust, perceived risk, security, privacy, ease of ordering, and satisfaction as essential determinants affecting the adoption of payment methods in e-commerce. Initial studies investigate consumer behavior about technology adoption through diverse models and theories. Hien (2023) enhances the Technology Acceptance Model (TAM) in e-commerce by incorporating trust and perceived risk as variables to assess their influence on system adoption. Researchers have implemented the TAM model across diverse technical areas, including e-learning, mobile commerce, logistics, online ticketing, and online shopping (Le & Lam, 2021). Numerous studies have been conducted to examine the implementation of e-commerce payment systems in Western Europe and the United States (Ilieva et al., 2022). The principal reason driving the rise of online shopping in Vietnam, as shown by prior e-commerce research, is the cash on delivery (COD) payment system (Michie, 2020; Le & Lam, 2021). Vietnam demonstrates considerable variation in its socioeconomic, cultural, and political dimensions. Models established in Western nations require validation within the Vietnamese context.

Despite the efforts of the Vietnam government and e-commerce enterprises to encourage e-payment through the provision of payment apps and portals, the majority of individuals still favor using cash for their purchases. A recent study has discovered that the perception of security plays a crucial role in determining the willingness to utilize electronic payment systems for online purchasing. Research is needed to establish the correlation between perceived security and the adoption of cash on delivery (ACOD) with simplicity of use. This study aims to examine and analyze the key behavioral factors that influence e-purchasers' willingness to adopt the COD payment method. This study will help marketers gain a deeper understanding of the payment behaviors of Vietnamese internet consumers, enabling them to develop more effective tactics, regulations, and technology.

2. LITERATURE REVIEW

2.1. Review of related studies

A significant aspect of this research is the role of perceived trust, privacy, and security in shaping customers' payment behaviors. Halaweh's studies emphasize that perceived security, privacy, and trust are critical determinants influencing customers' intentions to adopt cash-on-delivery (COD) payment systems in e-commerce transactions (Halaweh, 2017). This aligns with findings from Raza et al., who highlight that trust, privacy, and security are essential factors affecting customer satisfaction and adoption of online banking services, which can be extrapolated to e-commerce contexts (Raza et al., 2015). Furthermore, Al-Adwan et al. discuss how signaling theory can be applied to enhance perceived trust and reduce uncertainty in high-uncertainty-avoidance societies, suggesting that COD can serve as a signal of reliability for consumers (Al-Adwan et al., 2022).

In addition to trust, the literature identifies various psychological and social factors that influence the adoption of COD. Özkan et al. provide a theoretical framework that incorporates constructs from the technology acceptance model and the theory of reasoned action, indicating that social influences and perceived ease of use significantly affect the adoption of e-payment systems (Özkan et al., 2010). Vandiny et al. further elaborate on this by identifying personal, social, and promotional factors as crucial in determining the choice of COD as a payment method, with personal factors being particularly dominant (Vandiny et al., 2022). This suggests that understanding the socio-cultural context of Vietnamese consumers is vital for comprehending their payment behavior.

Moreover, the literature indicates that COD is often preferred in regions where consumers exhibit high levels of uncertainty avoidance, as it mitigates perceived risks associated with online purchases. For instance, Nampira and Chairy demonstrate that COD serves as a moderating variable that influences the relationship between perceived value and perceived risk in online purchase intentions (Nampira & Chairy, 2022). Similarly, Halaweh's research indicates that the assurance of privacy and security associated with COD significantly impacts consumer purchasing decisions (Halaweh, 2018). This is particularly relevant in Vietnam, where concerns about online fraud and product quality can deter consumers from using other payment methods.

The role of demographic factors, such as gender, is also noteworthy. Hossain's research suggests that gender may moderate the relationship between security perception and the adoption of mobile payment systems, indicating that demographic variables could influence payment behavior in the context of COD as well (Hossain, 2019). This highlights the need for a nuanced understanding of how various factors interact to shape consumer preferences in Vietnam's online shopping landscape.

2.2. Theoretical Frameworks

One foundational framework is the Technology Acceptance Model (TAM), which posits that perceived ease of use and perceived usefulness significantly influence users' intentions to adopt new technologies, including online payment systems. Luong et al. applied TAM to analyze factors influencing Vietnamese consumers' intention to use online payment methods, highlighting the importance of trust and perceived risk in this context (Luong et al., 2022). This model can be adapted to understand how perceived trust and security influence the adoption of cash-on-delivery (COD) as a payment method, suggesting that higher perceived trust may lead to increased intention to use COD.

In addition to TAM, the Theory of Reasoned Action (TRA) provides a complementary perspective by emphasizing the role of attitudes and subjective norms in shaping behavioral intentions. Özkan et al. discuss how perceived risk and trust impact the adoption of e-payment systems, indicating that consumers' attitudes towards these systems are influenced by their perceptions of security and privacy (Özkan et al., 2010). This framework can be instrumental in understanding how Vietnamese consumers' attitudes towards COD are shaped by their perceptions of trust and security.

Furthermore, the concept of perceived risk is critical in this research. Studies have shown that perceived

security and privacy concerns significantly affect online purchasing behavior. Aggarwal and Rahul's research elucidates a comprehensive model that links perceived security to consumer purchase intentions, emphasizing how transaction security and payment system reliability contribute to overall trust and satisfaction in e-commerce environments (Aggarwal & Rahul, 2018). This aligns with the notion that COD may serve as a risk-mitigating strategy for consumers wary of online payment systems.

Moreover, the role of trust as a mediating factor is underscored in the literature. The study titled "The Factors Impact on Online Purchase Intention" indicates that customer trust mediates the relationship between perceived reputation and online purchase intention, suggesting that enhancing trust can positively influence consumers' willingness to engage in online transactions (Ha et al., 2023). This insight is particularly relevant for understanding the dynamics of COD in Vietnam, where trust in e-commerce platforms may be a significant barrier to adopting alternative payment methods.

Lastly, demographic factors, such as age and gender, can also influence payment behavior. Research by Yaokumah et al. highlights that demographic influences can affect the use of e-payment services, suggesting that understanding the demographic context of Vietnamese consumers is essential for tailoring payment solutions (Yaokumah et al., 2017). This aspect can be integrated into the theoretical framework to provide a more comprehensive understanding of the factors influencing COD payment behavior.

2.3. Cash on Delivery Payment Method

The COD payment method is a widely used transactional approach in e-commerce, allowing customers to pay for their purchases only upon receiving the goods. This method provides a heightened sense of security for consumers who may have reservations about online transactions, as it enables them to inspect the product before making a payment (Halaweh, 2017). COD is especially prevalent in markets where trust in digital payment systems is still developing or where consumers prefer not to use credit cards or online banking services (Le & Lam, 2021). In Vietnam, COD has significantly fueled the growth of e-commerce, aligning well with the cultural preference for tangible transactions and alleviating concerns related to online payment fraud, privacy issues, and financial risks (Nguyen et al., 2020). By allowing customers to pay only upon delivery, COD enhances their confidence in the purchasing process, thereby promoting greater adoption of online shopping (Anjum & Chai, 2020).

2.4. Perceived trust

Perceived trust plays a pivotal role in shaping perceived security and the adoption of the Cash on Delivery (COD) payment method among online shoppers. Trust in an e-commerce platform signifies that customers believe the vendor will fulfill their promises and safeguard their personal and financial information. This trust reduces concerns about potential fraud and privacy breaches, thereby enhancing the overall sense of security during online transactions (Ilieva et al., 2022). Moreover, when customers trust an e-commerce vendor, they are more likely to choose payment methods that they perceive as secure and reliable. COD, which allows payment only upon delivery of goods, aligns with this trust by providing a tangible assurance of product receipt before payment (Anjum & Chai, 2020). As a result, we put up the following hypotheses:

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.

2.5. Privacy issues avoidance

Privacy issues avoidance is a critical factor influencing perceived security and the adoption of the Cash on Delivery (COD) payment method in online shopping. As customers become increasingly aware of the risks associated with sharing personal and financial information online, their concern for privacy significantly impacts their sense of security (Ilieva et al., 2022). When customers actively avoid situations that might compromise their privacy, such as entering sensitive data on potentially insecure websites, their

perceived security in online transactions is heightened. Furthermore, the COD payment method inherently addresses these privacy concerns by eliminating the need for customers to share their credit card or bank details online. By paying only upon receiving the goods, customers can ensure their privacy is maintained throughout the transaction process, thus making COD a more attractive option for those with privacy concerns (Le & Lam, 2021). Consequently, the following hypotheses are constructed:

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.

2.6. Financial risks avoidance

Financial risk avoidance is a crucial determinant of perceived security and the adoption of the Cash on Delivery (COD) payment method in online shopping. Customers often face concerns about potential financial losses due to fraudulent activities, receiving incorrect or substandard goods, and hacking incidents during online transactions (Ilieva et al., 2022). By actively avoiding these financial risks, customers can enhance their sense of security when shopping online. Additionally, the COD payment method directly addresses these financial concerns by allowing customers to verify the goods before making any payment. This reduces the perceived financial risk as customers only pay after ensuring the product meets their expectations, thus providing a safer and more reliable payment option (Nguyen et al., 2020). Therefore, the following hypotheses are constructed:

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.

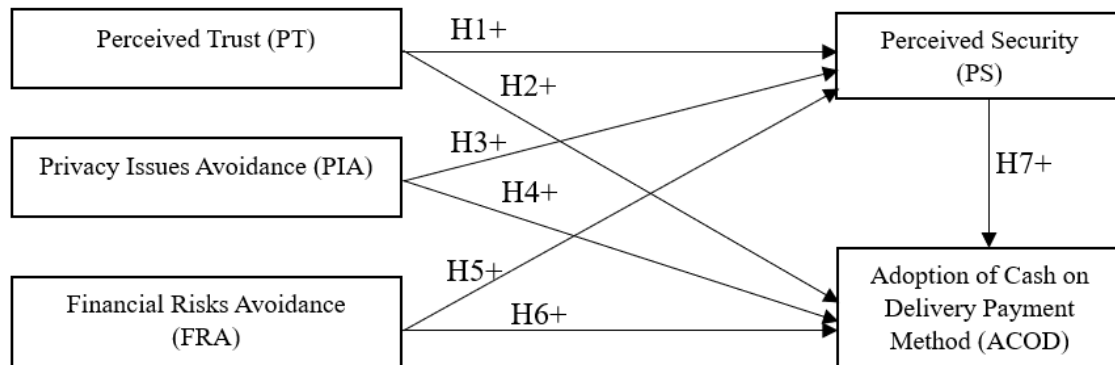
2.7. Perceived security

Perceived security is a fundamental factor influencing the adoption of the Cash on Delivery (COD) payment method among online shoppers. When customers feel secure during their online transactions, they are more likely to trust and engage with e-commerce platforms (Ilieva et al., 2022). Perceived security encompasses the confidence that personal and financial information is protected, transactions are safe from fraud, and there is a reliable mechanism for addressing any issues that may arise (Nguyen et al., 2020). This sense of security is particularly crucial in developing markets like Vietnam, where concerns about online payment fraud and data breaches are prevalent. COD inherently offers a higher level of perceived security by allowing customers to inspect the goods before payment, thus minimizing the risk of financial loss and increasing trust in the transaction process (Le & Lam, 2021, Hien, 2023). Thus, we propose the following hypothesis:

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

From the above discussions, the the research model is developed as:

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 (rho_a and rho_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	STDEV	T	P
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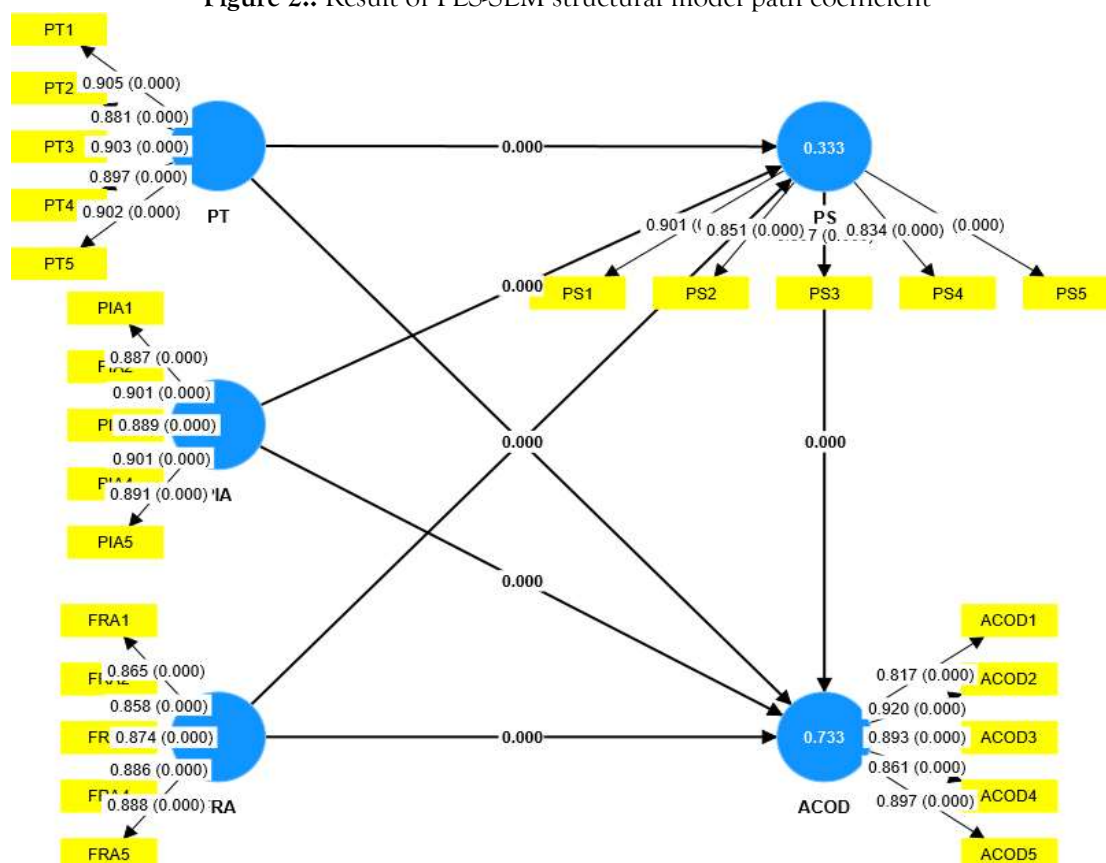
	sample	mean		statistics	values
PIA → PS → ACOD	0.057	0.057	0.014	3.956	0.000
FRA → PS → ACOD	0.068	0.068	0.014	4.810	0.000
PT → PS → ACOD	0.053	0.053	0.016	3.333	0.001

(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

The findings from this study underscore the critical role of perceived security in the adoption of the Cash on Delivery (COD) payment method among Vietnamese online shoppers. The results show that perceived

trust, privacy issues avoidance, and financial risks avoidance significantly influence perceived security, which in turn affects the adoption of COD. Specifically, perceived trust (PT) positively impacts perceived security (PS) with a path coefficient of 0.214, indicating that when customers trust an e-commerce platform, their sense of security increases. This heightened sense of security leads them to prefer COD as a payment method, as evidenced by the significant impact of perceived security on COD adoption (path coefficient of 0.247). This finding aligns with previous research that emphasizes the importance of trust in enhancing security perceptions during online transactions (Halaweh, 2017; Anjum & Chai, 2020).

Additionally, the study reveals that privacy issues avoidance (PIA) and financial risks avoidance (FRA) are crucial determinants of perceived security. Privacy issues avoidance significantly impacts perceived security with a path coefficient of 0.231, suggesting that consumers who actively avoid sharing personal information online feel more secure. This sense of security makes them more likely to adopt COD, as it allows them to maintain their privacy by avoiding the need to enter sensitive information online. Similarly, financial risks avoidance has a strong positive impact on perceived security (path coefficient of 0.276) and directly influences the adoption of COD (path coefficient of 0.445). This indicates that consumers who are concerned about financial risks, such as fraud or receiving substandard goods, prefer COD because it allows them to verify the goods before making any payment, thus reducing the perceived risk associated with online transactions.

The mediation analysis further highlights the significant indirect effects of privacy issues avoidance and financial risks avoidance on COD adoption through perceived security. The indirect effect of privacy issues avoidance on COD adoption via perceived security is 0.057, while the indirect effect of financial risks avoidance is 0.068. These findings emphasize the mediating role of perceived security, which enhances the impact of privacy and financial risk concerns on the preference for COD. Overall, the study provides comprehensive insights into the factors driving the adoption of COD among Vietnamese online shoppers, highlighting the pivotal role of perceived security in this process. These insights are crucial for e-commerce platforms aiming to improve their payment systems and build consumer trust, ultimately encouraging the use of secure and reliable payment methods like COD.

5. IMPLICATIONS

The findings from this study offer several important implications for e-commerce businesses, policymakers, and researchers. For e-commerce platforms, understanding the critical role of perceived security in the adoption of the Cash on Delivery (COD) payment method can inform strategies to enhance consumer trust and satisfaction. By prioritizing measures that increase perceived security, such as ensuring robust data protection protocols, transparent transaction processes, and reliable customer service, e-commerce companies can address key consumer concerns. This, in turn, can lead to higher adoption rates of COD, especially in markets like Vietnam, where trust in digital payment systems is still developing. Implementing features that allow customers to inspect products before payment, offering comprehensive return policies, and providing clear information about data privacy can further bolster perceived security and encourage the use of COD.

For policymakers, the study underscores the need for regulatory frameworks that enhance consumer protection in online transactions. Developing and enforcing stringent e-commerce regulations can help mitigate privacy and financial risks, thereby boosting consumer confidence in online shopping. Policies that mandate clear disclosures about data use, establish liability protections for fraudulent transactions, and support the development of secure payment infrastructures are essential. Additionally, promoting digital literacy programs that educate consumers about safe online practices and the benefits of various payment methods, including COD, can empower them to make informed choices. These initiatives can create a more secure and trustworthy e-commerce environment, fostering growth and innovation in the sector.

Researchers can leverage the extended Technology Acceptance Model (TAM) framework used in this study to explore further the factors influencing payment method adoption in different contexts and

regions. Future research could examine the impact of additional variables, such as cultural factors, technological advancements, and economic conditions, on perceived security and payment preferences. Longitudinal studies could provide deeper insights into how these relationships evolve over time and in response to changes in the e-commerce landscape. Moreover, comparative studies between developed and developing markets could highlight unique challenges and opportunities in enhancing online payment security. By expanding the scope of research in this field, scholars can contribute to the development of more effective and context-specific strategies for promoting secure and reliable e-commerce practices globally.

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