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Cryptocurrency in Vietnam: A deep dive into adoption factors and their interactions

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ABSTRACT

While traditional behavioral finance theories such as the TRA, TPB, and TAM have provided substantial insights, their application to the rapidly evolving digital finance sector, particularly cryptocurrency markets, has been limited. Addressing this gap, our study integrates Digital Trust Theory (DTT) with these frameworks to examine the role of government support in Crypto Adoption (CA) within Vietnam's dynamic but unregulated market, a prominent emerging market in global crypto trading. Utilizing Structural Equation Modeling, we processed data collected from 255 participants using SmartPLS 4.0 to explore complex relationships among User Characteristics (UC), Technology Characteristics (TC), External Environment (EX), and their impacts on Crypto Trust (CT) and Crypto Adoption CA. This dataset, comprising responses from a diverse array of participants including tech-savvy youths, business professionals, and financial experts across various regions of Vietnam, provides a robust basis for understanding the nuanced influences on cryptocurrency behaviors. Our findings underscore the significant mediating roles of Crypto Trust and governmental regulation, highlighting the crucial influence of External Environment factors on trust dynamics. These insights not only contribute to academic discourse by refining traditional behavioral finance theories for the digital era but also offer practical guidance for fostering a sustainable cryptocurrency market, thereby supporting economic development and financial security in Vietnam.

1. Introduction

There is extensive research on financial behavior over the past few decades, with scholars examining the factors that drive individuals and institutions in their financial decision-making processes (Ritter, 2003; Nga and Ken Yien, 2013; Duxbury, 2015; Arianti, 2018). According to these authors, traditional financial behavior theory has provided deep insights into how psychological, social, and economic factors influence financial choices.

Over time, advancements in AI, Machine Learning, and quantum computing have revolutionized the financial market, leading to innovative financial products and services, most notably cryptocurrencies powered by blockchain technology (Hashemi Joo et al., 2019); (Mikhaylov, 2020); (Atadoga et al., 2024). The underlying blockchain technology has expanded beyond currency, thousands of alternative cryptocurrencies, known as altcoins, have emerged, and enabling applications such as smart contracts and DeFi. The unique features of cryptocurrencies—such as decentralization, transparency, and reduced liability risks—have attracted a diverse group of users, including tech enthusiasts, institutional investors, and financial regulators.

Since Bitcoin's inception in 2009, cryptocurrencies have emerged as a global phenomenon, disrupting traditional financial systems and creating new paradigms in financial behavior (Jović and Kunjadić, 2018); (Watorek et al., 2023). As a result, conventional financial behavior theories, such as the TAM, TPB, need to be updated to effectively analyze cryptocurrency as a new form of digital financial instrument. Moreover, the intersection of rapid technological growth and financial behavior has opened new research frontiers, particularly regarding the interplay between technology beliefs, financial behavior, and cryptocurrency literacy.

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Despite a growing body of literature on Crypto Adoption (CA), key gaps remain. Most existing studies such as (Kala and Chaubey, 2023); (Ter Ji-Xi et al., 2021); (Farhana and Muthaiyah, 2022); (Alaeddin et al., 2018); (Rouibah et al., 2009) focus on developed markets or emerging markets like India and Malaysia, overlooking Vietnam, a leading cryptocurrency adopter with unique socio-economic dynamics. Additionally, prior research often emphasizes technological and regulatory factors without adequately exploring how trust in technology interacts with User Characteristics (UC) (Chen et al., 2024) and External Environment (EX) to shape adoption behaviors. Lastly, there is limited work addressing the behavioral intricacies of unregulated markets like Vietnam, where rapid adoption contrasts starkly with the absence of clear legal frameworks. These gaps limit our understanding of CA in contexts where technological literacy, demographic diversity, and regulatory uncertainty intersect.

This study aims to address these gaps by focusing on Vietnam, which ranks among the top three nations globally in Crypto Adoption (CA) (Kerr et al., 2023). As of 2023, Vietnam had over 7 million active cryptocurrency users, equivalent to approximately 7 % of its population. Despite the absence of a clear legal framework, the government has shown growing interest in regulating cryptocurrency, initiating pilot programs for blockchain applications in finance and considering taxation policies for crypto transactions. Furthermore, future trends suggest increasing adoption as Vietnam continues to embrace digital transformation, driven by its youthful, tech-savvy population and growing fintech ecosystem. These factors make Vietnam an ideal case study for exploring the dynamics of CA.

This paper investigates how technology trust influences financial behavior, extending established theories like TAM, and Social Cognitive Theory (SCT) to create a comprehensive framework for understanding CA in Vietnam. By examining the nuances of financial behavior, UC, and contextual factors, this research offers novel insights that not only contribute to academic discourse but also provide practical strategies for policymakers, crypto exchanges, and investors. This dual focus on theoretical refinement and actionable outcomes fills a critical void in the current literature.

2. Literature review

2.1. Behavioral Theories in Financial Decision-Making

"Behavioral potential," first introduced by Rotter (1960), has evolved to explain a broad range of behaviors. Prospect theory, proposed by Heukelom (2011); Kahneman (2012), significantly influenced economics and social sciences, eventually leading to the development of "behavioral economics" (Thaler, 2016). Behavioral theories have since explored themes like maintenance motives, self-regulation, resources, habits, and social and environmental influences to better understand human behavior (Kwasnicka et al., 2016). Traditional behavioral theories focus on ideal behaviors, while behavioral finance examines actual behaviors, incorporating cognitive psychology and limits to arbitrage (Ritter, 2003). Despite differences, both approaches share common factors: human psychology and external influences (Brooks and Byrne, 2008); (Mohammadi, 2024). In the digital age, especially with the rise of Fintech (Kumar and Rani, 2024a) and cryptocurrencies (Risman et al., 2023), traditional theories alone are insufficient to understand behavior. The concept of DT, particularly with blockchain technology, plays a critical role in shaping financial intentions (Shin, 2019). Therefore, this section integrates DTT to better understand financial behaviors in the digital financial market. Here are key theories and models in this domain.

2.2. TPB - Theory of Planned Behavior

Original TPB is from The TRA developed by Ajzen (1991), suggests that a person's intention to perform a behavior is the main predictor of whether they will do it. This intention is influenced by the individual's attitude toward behavior and SN (Bamberg et al., 2010), (Ajzen, 2012). From TRA theory, the "Attitude" towards the behavior could be negative or positive feelings about performing a specific behavior to decide intention of doing something. While "Subjects Norms" is the perceived social pressure to perform or not perform the behavior. TRA has been applied in various contexts, such as predicting internet banking adoption (Rouibah et al., 2009), learning at universities (Tavallaee et al., 2017), and recently in CA (Schaupp and Festa, 2018); (Zamzami, 2020); (Pandurugan and Al Shammakhi, 2024). The model in TRA has been effectively used to explain various behaviors, including internet banking adoption, learning at universities, and more recently, CA.

TPB further refined by (Conner and Armitage, 1998); (Bosnjak et al., 2020); (Ajzen, 2020) extends TRA by introducing the concept of "BC" to fix the limitation of TRA. This new added variable reflects the individual's perception of their ability to perform the behavior, and accounts for situations where individuals may have the intention to engage in a behavior but lack the necessary control to execute it. TPB incorporates factors such as past behavior, habit, and reasoned action, and has been applied to predict various behaviors, including travel mode choices (Bamberg et al., 2003), internet banking acceptance (Rouibah et al., 2009), stock investments (Mahardhika and Zakiyah, 2020), and cryptocurrency investments (Schaupp and Festa, 2018); (Zamzami, 2020); (Norisnita and Indriati, 2022); (Pandurugan and Al Shammakhi, 2024).

2.3. TAM - Technology Acceptance Model

The primary goal of TAM is to try to examine why people accept various technologies by exploring external factors influencing their internal attitude (Davis et al., 1989). In TAM, negative or positive attitude towards technology is explained by two primary factors PU and PEU before using technology. "PU" is the degree of belief that a person uses the technology to enhance their performance while "PEU" is the degree of belief during using technology with free effort. TAM and some other extended TAM have been adapted to study the adoption of various financial technologies and different fields, such as internet acceptance (Shih and Fang, 2004), job application online (Parikh et al., 2021), e-commerce (El Ashfahany et al., 2023), acceptance monthly bill payment (Ooi and Tan, 2016); (Dalton et al., 2024), and cryptocurrency (Sagheer et al., 2022); (Almajali et al., 2022).

2.4. SCT - Social Cognitive Theory and Financial Behavior

The SCT, proposed by (Bandura, 1986), explains human behavior through the interaction of behavior, personal factors, and environmental factors. According to (Nabavi, 2012); Social Cognitive Learning Theory (SCLT) further explores this interaction, emphasizing that personal factors include cognitive aspects such as vicarious experiences, expectations of future outcomes, and responses shaped by the current environment. The theory also connects to self-efficacy and self-regulation, suggesting individuals choose actions based on their perceptions of appropriate behavior (Fan and Williams, 2009). Researchers such (Rana and Dwivedi, 2015); (Turan et al., 2015); (Abrahão et al., 2016) have expanded SCT by incorporating variables like outcome expectations, self-efficacy, social influence, PR, and financial literacy to better understand behavior in various contexts, including technology adoption and financial markets. In the context of cryptocurrency markets, however, many factors are not grouped when analyzing financial behavior in the research by market (Arias-Oliva et al., 2019); (Arias-Oliva et al., 2019); (Albayati et al., 2020). However, (Kimiagari and Baei, 2022) incorporates additional variables related to human factors based on SCT included: innovativeness, various experience, cognitive, compatible cognition, hedonic, technophobia. Therefore, this paper integrates insights from SCT and financial behavior to identify variables categorized under UC and EX utilizing DTT to analyze CA.

2.5. Cryptocurrency's Capacity for Advancing Open Innovation

Cryptocurrencies function as open innovation ecosystems, fostering decentralized participation that accelerates adoption while presenting governance challenges and potential barriers to implementing blockchain technology (Tangsakul and Sureeyatanapas, 2024). Integrating insights from open innovation dynamics offers a comprehensive understanding of cryptocurrency development, diffusion, and utilization. For example, bounded rationality Jones (2003) explains how decision-making under uncertainty shapes adoption. Moreover, personal innovation is indeed to adopt new things such as new technologies, and collective intelligence (Wang et al., 2020); (Woolley and Gupta, 2024). Business models and open-source engineering Shahrivar et al. (2018) further illustrates the role of transparency and collaboration in CA Chong et al. (2019). In addition, CA open innovative payment system for SMEs and global finance sector (Titov et al., 2021). These insights emphasize the potential of cryptocurrency ecosystems to benefit SMEs and governments, sustaining long-term innovation.

2.6. Crypto Adoption (CA) and Trust in Technology

Trust in technology, as explored by Müller (1996), involves three key aspects: legal regulation, knowledge enhancement, and institutional trust centers, which collectively contribute to social acceptance of new technologies. While these elements are not directly measured in this study, they underscore the importance of established laws, regulations, and knowledge dissemination in fostering a society's understanding of emerging technologies. According to Benamati et al. (2010), technology trust acts as a mediator between Attitude and the concepts of PEU and PU, as outlined in the TAM. Additional studies by Folkinshteyn and Lennon (2017); Guych et al. (2018); Mendoza-Tello et al. (2018); Shahzad et al. (2024) further support the idea that PEU and PU serve as mediators between Trust and Behavioral Intention, highlighting the connection between Technology Trust and Attitude through these mediating variables.

Numerous scholars have established a direct relationship between Trust in Technology and CA, regardless of the role of PEU and PU. Trust in blockchain technology, or CT, is crucial for influencing CA or the intention to adopt cryptocurrencies. Factors such as decentralization, regulation, stability, security, knowledge, investment potential, alternative currency status, profitability, openness, immutability, and ease of transfer contribute to building CT (Marella et al., 2020). Additionally, variables such as government support, technology awareness, and blockchain transparency play significant roles in shaping trust Sagheer et al. (2022); Koroma et al. (2022); Rahardja et al. (2023). Recent research by Norbu et al. (2024) identifies a comprehensive list of factors influencing CT, including privacy, security, transparency, regulation, education, financial inclusion, user perception, and societal and cultural aspects. Building on Shin (2019) concept of Digital Trust (DT), this study categorizes the factors influencing CT into three groups: User Characteristics (UC), Technology Characteristics (TC), and Contextual Factors or EX.

In summary, theory of behavior Intention was found in many famous models such as the TRA by Ajzen (2012). A few years later, TPB by Conner and Armitage (1998); Ajzen (1985) was developed into TPB/TAM (Goodhue, 1995) These models highlight key variables such as AT, BC, and SN, which affect an individual's intention in a particular behavior. Fig. 1

With the swift advancement of technology, researchers are increasingly focusing on financial behaviors, including CA. While prior research has explored various determinants of CA, significant gaps remain fully comprehending the complexity of this phenomenon. Studies by Abrahão et al. (2016); Shaw et al. (2018); Schaupp and Festa (2018); Albayati et al. (2020); and (Kumar and Rani, 2024a) have provided insights into user behavior, yet these studies primarily focus on general adoption trends rather than the specific challenges and barriers hindering mass adoption in developing countries like Vietnam.

Recent studies have broadened the scope of cryptocurrency adoption research by examining external influences such as technology awareness and government support (Sagheer et al., 2022), blockchain transparency and technology attachment (Koroma et al., 2022), and individual readiness for technological adoption (Koroma et al., 2022). Additionally, Norbu et al. (2024); and Kumar and Rani (2024b) have identified key factors influencing adoption, including privacy, security, regulation, familiarity, financial inclusion, and cultural aspects.

While these studies provide valuable insights, they often fail to integrate the interplay between user trust, regulatory uncertainty, and individual investor characteristics—three critical barriers to cryptocurrency adoption. This gap is particularly relevant in Vietnam, where individual investors drive cryptocurrency adoption in the absence of direct government support. Understanding how these investors navigate regulatory ambiguity and assess trust in digital assets is essential for developing a more comprehensive framework for adoption.

Moreover, despite the growing body of literature, limited research critically examines how regulatory frameworks and financial literacy levels influence adoption rates across different demographics. While Shin (2019) highlights digital trust as a key determinant, trust formation in cryptocurrencies remains an evolving concept shaped by technological advancements, security breaches, and policy changes. This gap underscores the need for a more comprehensive investigation into the

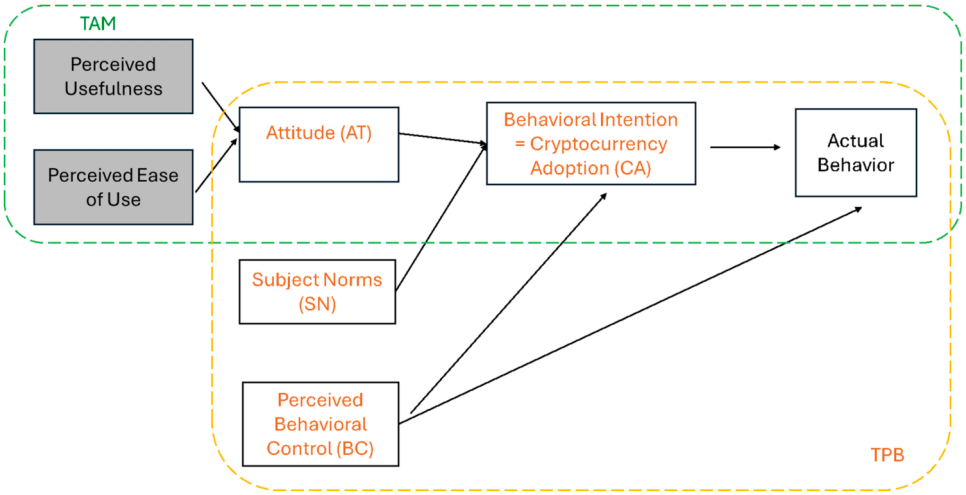

Fig. 1. Summary of theories TPB, TAM.

socio-economic and psychological dimensions of cryptocurrency adoption. Without a deeper understanding of these factors, efforts to increase adoption may remain fragmented and ineffective. Therefore, this study aims to bridge these gaps by offering a more holistic analysis of CA determinants, incorporating both user-centric and institutional perspectives.

2.7. Bridging the Gaps in Cryptocurrency Adoption Research

2.7.1. Empirical Context

Research on cryptocurrency adoption has grown in recent years, yet significant gaps remain. Sousa et al. (2022) highlights the need for a deeper understanding of consumer acceptance and blockchain trust, echoing similar concerns raised by (Lee et al., 2021). So far, empirical studies have shown that factors like intention to use, technology trust, and ease of use play a crucial role in shaping financial behavior. Scholars such as Benamati et al. (2010); Folkinshteyn and Lennon (2017); Mutambik et al. (2024); El Hajj and Farran (2024) have explored the relationship between technology trust and cryptocurrency adoption, offering valuable insights into this evolving landscape.

However, when it comes to perceived risk (PR), the findings are far from consistent. While some studies suggest that PR has little to no impact on cryptocurrency investment intention (Abrahão et al., 2016); (Arias-Oliva et al., 2019); (Mendoza-Tello et al., 2019); (Almajali et al., 2022), others indicate that its influence may depend on external factors. Given these mixed results, this study opts to exclude PR from its model. Meanwhile, Sousa et al. (2022) also point out that trust in blockchain technology remains a significant challenge. Research by Marella et al. (2020); Shin (2019); and Shahzad et al. (2024) have examined this issue by identifying three key trust-related factors: user confidence (UC), technology competence (TC), and experience (EX).

2.8. Theoretical Foundations

Beyond technological trust, it's essential to recognize that both personal and environmental factors influence behavior. This perspective aligns with Social Cognitive Theory (SCT) Nabavi (2012), which suggests that individuals' decisions are shaped by their interactions with technology, society, and personal beliefs. Over time, SCT has been extended to cryptocurrency adoption, as seen in studies by Mendoza--Tello et al. (2018); and Li et al. (2023), which highlight the role of psychological and social influences in shaping investment decisions.

Despite these advancements, no existing model fully integrates three critical aspects: investor psychology, cryptocurrency knowledge, and behavioral intent within the broader framework of technology trust. Traditional behavioral finance theories, while insightful, fall short in explaining cryptocurrency adoption in today's rapidly evolving technological landscape. This gap underscores the need for a comprehensive behavioral model—one that brings together Technology Trust Theory, Social Cognitive Theory (SCT), and Financial Behavioral Theory to better capture the complexities of cryptocurrency adoption.

2.9. Model and Hypothesis Development

2.9.1. Model Development

Based on the theory gaps, this paper integrates key theories such as TRA, TPB, TAM, SCT, and DT. New variables related to CT, crucial for shaping regulatory frameworks and strategies for diverse investors need to be added in a rapidly evolving financial landscape. The research model suggests that CA is influenced by SN, CT, and BC, with CT and AT acting as mediators. The study also emphasizes UC, EX, and TC as critical factors affecting CT, particularly in the Vietnamese context. Fig. 2

2.10. Hypothesis Development

2.10.1. The group of variables in DT and Social Cognitive Theory

Several studies, such as Mendoza-Tello et al. (2019); Shin (2019); Norbu et al. (2024), have identified factors influencing DT in technology, particularly in cryptocurrencies Benamati et al. (2010); Mendoza-Tello et al. (2018). Shin (2019) 's framework emphasizes individual factors (e.g., innovativeness, personal beliefs), TC (e.g., security, scalability), and environmental factors (e.g., regulation, awareness) as foundational in shaping DT in cryptocurrencies. In emerging markets like Vietnam, where technological adoption is rapid but regulatory frameworks are underdeveloped, understanding how these factors collectively influence trust is crucial.

Similarly, the SCT by Nabavi (2012) aligns with these factors, highlighting how personal factors, behavior, and environmental influences interact dynamically. This perspective is particularly relevant in Vietnam, where a young, tech-savvy population and rapid digital transformation intersect with external factors like government policy and financial education. SCT provides a valuable framework for analyzing the interaction between UC and external influences in shaping CA. Based on the above, the following hypotheses are proposed:

- *H1: UC positively affects the EX of cryptocurrency trading, and vice versa.*

  User traits, such as openness to innovation and financial literacy (Norbu et al., 2024); (Mittal, 2022), shape how individuals perceive

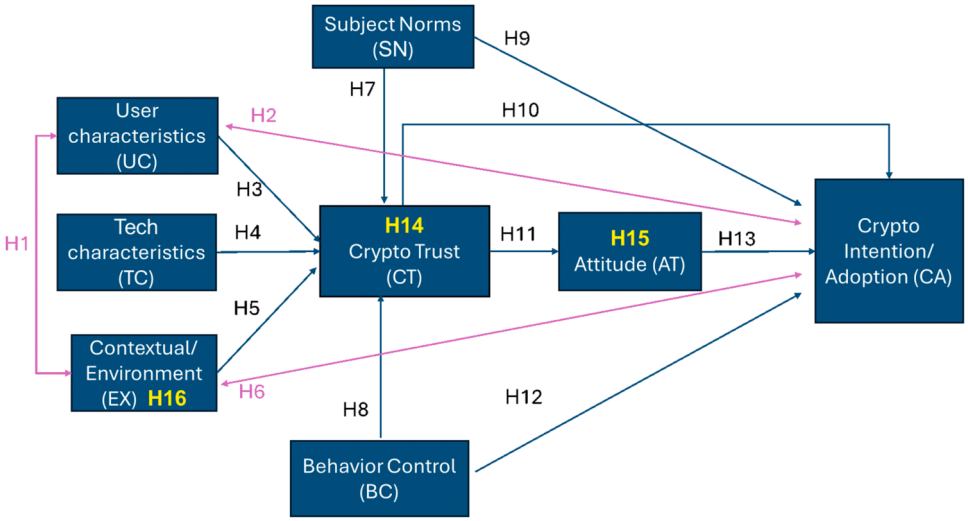

Fig. 2. Proposed model.

and interact with external conditions, including regulatory clarity and economic stability. In turn, external factors like government policies and digital infrastructure enhance or hinder these user traits. This reciprocal relationship is evident in emerging markets like Vietnam, where external conditions evolve rapidly to support technological adoption.

- *H2: UC positively influences CA, and a high intention to adopt CA positively affects UC.*

Personal characteristics such as overconfidence, herding behavior, and openness to innovation are key drivers of CA (Altaf and Jan, 2023). In Vietnam's expanding cryptocurrency market, successful adoption experiences reinforce these traits by boosting user confidence and knowledge, creating a positive feedback loop that enhances UC.

- *H6: The EX positively impacts CA, and a high intention to CA positively influences the EX.*

External factors such as government support, regulatory clarity, and financial education encourage CA by mitigating risks and fostering user confidence Toufaily et al. (2021); Srokosz and Kopciaski (2015). In Vietnam, the absence of strict regulations presents both opportunities and challenges. Positive adoption trends encourage more supportive policies from governments and financial institutions, further strengthening the environment for cryptocurrency usage. Fig. 3

Furthermore, empirical studies, such as Costa, McCrae (2010); Kumari et al. (2023); Nauman Sadiq and Ased Azad Khan (2019) have examined the impact of the EX on UC (H1) and CA (H6), as well as the influence of UC on CA (H2). These studies suggest that factors like financial education, regulatory clarity, and socio-economic stability shape user traits and adoption behaviors. For example, Kumari et al. (2023) highlights how government policies influence personal attitudes toward cryptocurrencies, while Costa, McCrae (2010) emphasize the reciprocal relationship between personal traits and external conditions. However, direct relationships between UC and EX, CA and UC, and CA and EX have not been extensively explored in the context of emerging markets like Vietnam. Given Vietnam's unique environment, this study aims to extend Trust Theory and SCT by testing these hypotheses, refining the model to emphasize positive CA trends. Consequently, all hypotheses are examined within a positive framework to reflect Vietnam's dynamic cryptocurrency landscape.

2.10.1.1. User Characteristics - UC. Drawing on SCT, research has explored various cognitive, affective, and personal traits influencing UC in cryptocurrency use. These include personal traits Costa, McCrae (2010); (Liu et al., 2021); (Nauman Sadiq and Ased Azad Khan, 2019); (Ozer and Mutlu, 2019); (Akhtar and Das, 2020) demographics, psychology, and personal finance (Mittal, 2022). For instance, studies have shown that generational biases, such as overconfidence, fear of missing out, and herding behavior, significantly influence CA (Altaf and Jan, 2023). These traits highlight how personal attitudes, and behavioral tendencies drive technology adoption, particularly in high-risk, high--reward contexts like cryptocurrencies.

DTT further highlights personal innovation and user involvement as key factors for building trust in blockchain technology. Key constructs, such as EE, SI, PE, and FC, have been shown to significantly impact trust and adoption intentions (Shin, 2019); (Toufaily, 2022); (Turan et al., 2015); (Albayati et al., 2020). These findings suggest that users' willingness to engage with blockchain technology depends not only on its PEU and utility but also on their trust in its reliability and security. Numerous studies Arias-Oliva et al. (2019); Gillies et al. (2020); Restuputri et al. (2023); Jegerson et al. (2023); Alomari and Abdullah (2023); Kumari et al. (2023) provide further evidence that these factors are critical in shaping user trust and adoption behavior. At the same time, PR and PC can act as barriers to adoption, negatively influencing user behavior (Abrahão et al., 2016). These challenges are particularly pronounced in emerging markets, where regulatory uncertainties and limited financial literacy exacerbate users' concerns about CA.

Notedly, SCT emphasizes the interplay of cognitive, affective, and biological factors with environmental influences and behaviors, this study adapts these insights to the blockchain context. Blockchain's peer-to-peer verification system underscores the significance of individual agency in transactions, necessitating a closer examination of individual characteristics. To better represent this context, the study replaces the term personal factors with UC, aligning the concept with the behaviors and traits of individual investors in the cryptocurrency market. UC comprises six prominent constructs, consistent with SCT's personal factors, which have been validated in prior research for their impact on CA. These include vicarious experience, hedonic cognition, performance expectancy, and effort expectancy (Restuputri et al., 2023) as well as hedonic motivation, habit (Abrahão et al., 2016), and technophobia (Kimiagari and Baei, 2022).This reframing ensures the model is both theoretically grounded and contextually relevant to the dynamics of CA in Vietnam.

By integrating SCT and DTT, this study focuses on psychological factors and personal expectations specific to cryptocurrency trading. Sub-criteria within UC, such as vicarious experience, PE (Kimiagari and Baei, 2022), EE, hedonic motivation, habit (Restuputri et al., 2023), and technophobia (Abrahão et al., 2016), have shown positive correlations with CT. For example, hedonic motivation, which relates to the enjoyment users derive from engaging with technology, plays a crucial role in shaping trust and behavioral intentions (Restuputri et al., 2023). However, most existing studies focus on mobile payment adoption or e-banking, leaving blockchain technology trust largely unexplored. To better understand these relationships, the study adapts existing measures to the cryptocurrency context, proposing the following hypothesis:

- *H3: UC positively affects CT.*

The hypothesis is supported by empirical evidence demonstrating that personal traits, such as innovativeness, positively correlate with trust in blockchain technology (Shin, 2019); (Kimiagari and Baei, 2022). These traits enable users to overcome PRs and engage more confidently with cryptocurrencies, particularly in markets like Vietnam, where trust is crucial for adoption.

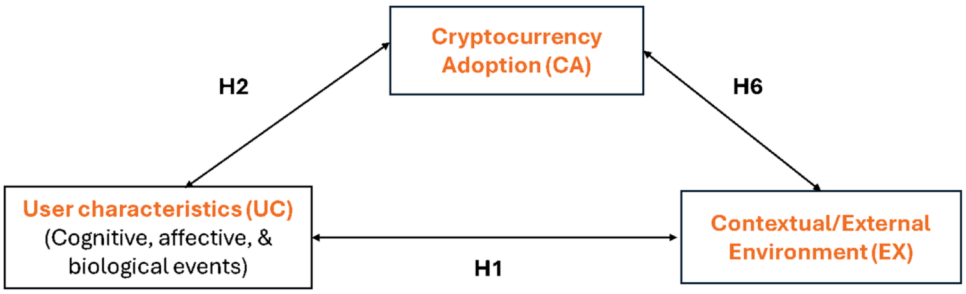

Fig. 3. Applied SCT in Crypto Adoption.

2.11. Technology Characteristics - TC

TC encompass various factors that impact trust in blockchain and cryptocurrencies. Technology readiness, which reflects users' preparedness to engage with new technology, is a critical enabler of trust and adoption (Illia et al., 2023). Key TCs, such as stability, security, transparency, regulation, scalability, privacy, and immutability, have been widely acknowledged as foundational to building trust in blockchain systems (Morosan and DeFranco, 2016); (Marella et al., 2020); (Mashatan et al., 2022); (Toufaily, 2022). These characteristics collectively enhance users' confidence in the reliability and effectiveness of cryptocurrency systems, particularly in high-risk financial contexts.

Studies show that factors like security, anonymity, privacy, and decentralization can influence trust both positively and negatively, depending on the specific context of use (Shin, 2019); (Koroma et al., 2022). For example, while decentralization enhances trust by reducing reliance on intermediaries, it also introduces risks related to governance and technical vulnerabilities. Security features such as encryption and fraud prevention mechanisms are critical in fostering trust by ensuring that transactions are protected from cyberattacks (Chen et al., 2022). Privacy mechanisms that enable anonymous transactions further enhance trust among users who value confidentiality. However, these same mechanisms can undermine regulatory oversight, highlighting the need for a balanced approach in designing blockchain systems.

Although significant research has explored TCs and trust in developed countries, the relationship remains unclear in developing countries, where users often face unique challenges such as limited digital literacy, weak regulatory frameworks, and infrastructure constraints. Norbu et al. (2024) identifies a comprehensive set of factors influencing trust and TC, but these factors have not been fully examined in the context of emerging markets like Vietnam. This gap is particularly significant given Vietnam's position as a leading adopter of cryptocurrencies, where technological factors play a critical role in shaping user trust and adoption.

For cryptocurrencies, some characteristics have proven to influence both user trust and the likelihood of widespread adoption. Security is paramount, ensuring protection against fraud and hacking, which are major concerns in digital finance (Koroma et al., 2022). Speed enhances system reliability and user experience by enabling real-time transactions, a feature critical for practical applications in high-frequency trading and retail payments (Arli et al., 2021). Scalability addresses long-term user confidence by allowing the system to handle increasing transaction volumes with minimal network congestion and low fees, thereby ensuring economic efficiency and robustness (Marella et al., 2020).Transparency builds trust by enabling users to verify transactions and audit system integrity, which is particularly important in environments with low regulatory oversight.

This study focuses on measurable TCs, including transparency, security, privacy, and reliability, to explore their effects on CT in Vietnam. The inclusion of these factors aligns with prior findings while addressing the unique challenges faced by users in emerging markets. Accordingly, the following hypothesis is proposed:

- *H4: TC positively affects users' CT.*

Empirical evidence highlights that robust security measures, fast transaction processing, and scalable infrastructure build trust by addressing user concerns and improving system usability (Koroma et al., 2022); (Marella et al., 2020). In Vietnam, where users face heightened concerns over fraud and infrastructure limitations, these characteristics are particularly critical for fostering trust and driving adoption.

2.12. Contextual/External Environment - EX

The EX plays a crucial role in influencing investors' trust in cryptocurrencies. Key factors, such as government regulation, financial education, access to digital resources, and economic stability, shape how users perceive and engage with blockchain technology. Trust in government, particularly its role in regulating illegal crypto trading, is especially significant in Vietnam. This aligns with Müller (1996)'s theory on Trust in Technology, which emphasizes the importance of legal regulation in fostering community trust. Robust regulation provides users with confidence in the legitimacy of cryptocurrencies, reducing risks and promoting adoption in environments marked by uncertainty.

Knowledge of cryptocurrencies is another critical component of EX, often linked to BC, particularly as Awareness (Li et al., 2022); (Shahzad et al., 2024). Higher levels of awareness help users understand the utility and risks of cryptocurrencies, enabling more informed decision-making. For example, financial literacy programs that target diverse demographics can significantly enhance users' trust and encourage broader adoption. Additionally, transaction speed, a factor connected to TC, supports user trust by ensuring efficiency and reliability in financial exchanges (Toufaily, 2022).

Studies also highlight the role of government support and regulation in moderating the relationship between Technology Awareness and factors such as PEU, PU, and PR (Sagheer et al., 2022). For instance, clear regulatory guidelines mitigate PRs by establishing safeguards against fraud and scams, which are common barriers to adoption in developing markets. Specifically, in India, the government support is found as a moderator the relationship between CA and continuance intention (Kala and Chaubey, 2023). While empirical evidence from Vietnam demonstrates how government initiatives, such as blockchain pilot programs, can strengthen trust and promote innovation (Benamati et al., 2010); (Mendoza-Tello et al., 2019); (Mashatan et al., 2022).

In addition to regulation, financial education is a critical external factor. Alomari and Abdullah (2023) identify financial education as an essential tool for enhancing users' understanding of cryptocurrencies, particularly in emerging markets where knowledge gaps persist. Financial education improves users' ability to evaluate cryptocurrency investments, fostering trust and reducing the influence of misinformation. Furthermore, economic stability and access to digital resources, such as reliable internet infrastructure, amplify trust and adoption by providing users with the tools necessary to participate in the digital economy (Srokosz and Kopciaski, 2015). In Vietnam, where a large portion of the population is tech-savvy but lacks advanced financial literacy, targeted educational programs and improved digital access are crucial for scaling cryptocurrency use.

Facilitating Conditions, which provide users with the necessary resources to trust and engage with blockchain technology, are another important element of the EC (Morosan and DeFranco, 2016); (Restuputri et al., 2023). These conditions include access to training, technical support, and information systems that empower users to interact confidently with cryptocurrencies. In Vietnam, these elements are increasingly relevant as more users enter the cryptocurrency market with limited experience or access to expert guidance. Moreover, (Gupta et al., 2023) finds that FC plays important roles in cryptocurrency adoption. This study considers government regulation, financial education, economic stability, and facilitating conditions as key sub-factors of the EX and proposes the following hypothesis:

- *H5: EX positively affects CT.*

Empirical evidence highlights that government regulation and financial education enhance users' trust by addressing concerns over legality and risk (Toufaily, 2022); (Alomari and Abdullah, 2023). Additionally, economic stability and access to digital resources provide users with the infrastructure and confidence to engage in CA, particularly in Vietnam's rapidly evolving digital economy.

2.13. The groups of variables in TAM

Several studies have used the TAM to examine the relationships

between SN, AT, BC, and Intention Behavior (Rouibah et al., 2009); (Turan et al., 2015); (Tavallaee et al., 2017); (Schaupp and Festa, 2018); (Mahardhika and Zakiyah, 2020). These studies have explored various domains, such as internet banking (Rouibah et al., 2009); general technology acceptance (Turan et al., 2015); mobile learning (Tavallaee et al., 2017); and stock investment intentions (Mahardhika and Zakiyah, 2020) Their findings suggest that TAM provides a robust framework for understanding how users' attitudes and perceptions influence behavioral intentions across different technologies.

In the context of cryptocurrencies, some studies Zamzami (2020); Almajali et al. (2022); Prakosa and Sumantika (2022) have examined TAM constructs but did not specifically measure sub-factors of SN, AT, and BC. This creates a gap in understanding how these sub-factors individually and collectively influence CT and adoption, particularly in emerging markets like Vietnam, where socio-economic and cultural dynamics differ from developed markets. Therefore, this study identifies and extracts relevant sub-factors from the existing literature to better understand these relationships in the cryptocurrency context.

2.14. Subject Norms - SN

SN refers to the perceived social pressure to engage in or refrain from a particular behavior. Research of Illia et al. (2023) demonstrates that SN positively influences PU and PEU, which in turn affect CT (Benamati et al., 2010); (Mendoza-Tello et al., 2019). For example, in the context of CA, social influences from family, peers, or influencers can shape perceptions of utility and usability, thus enhancing trust in blockchain technology. These findings suggest that SN acts as a critical driver of trust through its indirect effects on PU and PEU.

Based on this evidence, the following hypothesis is proposed:

- *H7: SN toward cryptocurrency positively affects CT.*

However, conflicting findings exist in literature. For instance, Zamzami (2020); Pandurugan and Al Shammakhi (2024) found that SN does not efficiently impact the intention to adopt cryptocurrencies, particularly in contexts where and social or cultural acceptance of cryptocurrencies remains low. Conversely, other studies such as Schaupp and Festa (2018); Mahardhika and Zakiyah (2020); Almajali et al. (2022); Al Reshaid et al. (2024) report a significant positive connection between SN and CA. These inconsistencies highlight the need for further investigation into the relationship between SN and CA, particularly in Vietnam, where CA is growing rapidly but societal acceptance remains mixed. Accordingly, the following hypothesis is proposed:

- *H9: SN toward cryptocurrency positively affects CA.*

2.15. Components of SN

Previous studies Lu (2014); Morosan and DeFranco (2016); Albayati et al. (2020); Restuputri et al. (2023) have measured social influences as a component of SN, while others Schaupp and Festa (2018); Lai (2019); Pandurugan and Al Shammakhi (2024) used Motivation to Comply as another component. Social influence refers to the impact of peers, family, or societal norms on an individual's behavior, whereas motivation to comply reflects the individual's willingness to adhere to these social expectations. These two sub-factors are particularly relevant in the context of emerging markets, where community-driven adoption patterns often play a crucial role in technology acceptance.

For instance, Restuputri et al. (2023) highlight how societal norms and peer influence drive trust and adoption, especially in environments with limited formal financial education. Similarly, Lai (2019) identifies motivation to comply as a key determinant of adoption, particularly in collectivist cultures where social expectations strongly influence individual decisions. In Vietnam, where societal norms heavily influence technology use, these components provide valuable insights into the mechanisms through which SN affects CT and adoption. These two sub-factors, Social Influence and Motivation to Comply, will be used to build the questionnaire and test the hypotheses 7 and 9.

2.16. Behavioral Control - BC

Pandurugan and Al Shammakhi (2024) used financial literacy (FL) as a measure of BC to explore its mediating role between SN and CA, as well as between AT and CA. Their findings indicate that FL plays a critical role in enhancing users' ability to make informed CA decisions by mitigating knowledge gaps. While FL effectively mediated the relationship between AT and CA, it did not directly impact CA (Benamati et al., 2010). This suggests that other components of BC, such as users' perceived control over crypto-related behaviors, might also influence adoption outcomes.

Although limited research directly examines the influence of BC on CT, Kumari et al. (2023) found that FL, as a sub-factor of BC, significantly affects the relationship between behavioral intention and PE. This ties back to the role of UC in shaping trust, as users with higher financial literacy are better equipped to assess the utility and risks associated with cryptocurrencies. Additionally, BC—defined as users' confidence in their ability to execute cryptocurrency transactions—plays a pivotal role in fostering trust by reducing uncertainty and increasing transaction efficacy (Arli et al., 2021); (Rahardja et al., 2023); (Norbu et al., 2024). This highlights the potential for BC to positively impact CT through mechanisms such as improved literacy, perceived competence, and confidence in cryptocurrency systems. Based on this analysis, the following hypothesis is proposed:

- *H8: BC positively affects CT.*

Research evidence further supports the relationship between BC and CA, emphasizing that users' perceived control over cryptocurrency-related decisions significantly influences adoption outcomes. Studies Tavallaee et al. (2017); Schaupp and Festa (2018); Mahardhika and Zakiyah (2020) demonstrate a positive relationship between BC and CA, particularly when users possess sufficient resources, knowledge, and control to engage with cryptocurrencies effectively. However, Zamzami (2020) reported no significant effect of BC on cryptocurrency intention, especially in contexts with low adoption rates or limited access to enabling resources. This inconsistency suggests that BC's impact on CA may vary depending on contextual factors such as regulatory environments, digital infrastructure, and socio-economic conditions, which are particularly relevant in developing countries like Vietnam. In Vietnam, where digital literacy is growing but remains unevenly distributed, BC could play a critical role in facilitating CA by empowering users with the skills and confidence needed to navigate a complex and often unregulated market. To address this gap, the following hypothesis is proposed:

- *H12: BC positively affects CA.*

2.17. Crypto Trust - CT

Studies by Benamati et al. (2010); Prakosa and Sumantika (2022); Al Reshaid et al. (2024) found that trust directly influences user behavioral intention, highlighting its critical role in shaping technology adoption decisions. Trust acts as a mediator between PEU, PU, and user intentions, making it a cornerstone of adoption models. However, Mendoza-Tello et al. (2019) reported that CT is not a strong predictor of CA in certain contexts, suggesting that external factors, such as regulatory clarity and user education, may moderate this relationship. These conflicting findings indicate a need for further investigation into the role of CT in CA, particularly in emerging markets like Vietnam, where trust plays a pivotal role in navigating risks associated with unregulated financial systems. To explore this further in the context of Vietnam, this study proposes:

- *H10: CT positively affects CA.*

Additionally, Shin (2019) showed that CT positively affects AT, emphasizing that trust builds confidence and shapes positive perceptions of cryptocurrencies. This relationship is particularly relevant in Vietnam, where skepticism about the security and legitimacy of cryptocurrencies persists. On the other hand, Toufaily (2022) highlighted that factors like disintermediation and decentralization can have mixed effects on trust, influencing attitudes both positively and negatively. For instance, while decentralization enhances transparency, it may also reduce users' perceived control, impacting AT. These nuances suggest that the relationship between CT and AT is complex and context dependent.

Other studies Prakosa and Sumantika (2022); Mendoza-Tello et al. (2019) highlighted that PEU and PU are critical sub-factors of AT influencing CT (Almajali et al., 2022); (Leng et al., 2011). These findings underscore the importance of user-centric factors in shaping attitudes toward cryptocurrencies, as ease of use and perceived benefits are directly tied to trust. For example, in Vietnam, where many users are first-time cryptocurrency investors, the usability and utility of cryptocurrency platforms significantly shape their trust and overall attitudes. Thus, the study proposes:

- *H11: CT positively affects Attitudes toward Cryptocurrency.*

2.18. Attitudes - AT

AT refers to a user's overall evaluation of a behavior, shaped by factors such as PU, PEU, PR, and PE. Pandurugan and Al Shammakhi (2024) found no explicit correlation between AT and CA while Al Reshaid et al. (2024) showed a strong relationship. That contrast suggests that the relationship might be moderated by contextual factors such as financial literacy or regulatory clarity. However, other study Almajali et al. (2022) demonstrated that AT significantly influences cryptocurrency intention through its interaction with PR, PU, PE, and PEU. For instance, positive attitudes often result from users perceiving cryptocurrencies as both useful and enjoyable, which increases their likelihood of adoption. These findings are particularly relevant in emerging markets like Vietnam, where attitudes are shaped by both personal experiences and broader socio-economic factors.

Leng et al. (2011) and Benamati et al. (2010) also reported that PU and PEU significantly affect AT and indirectly impact CT. For instance, Gil-Cordero et al. (2020) confirmed that users with a positive attitude toward cryptocurrencies are more likely to trust the technology, highlighting the feedback loop between trust and attitudes. These findings underscore the importance of designing platforms that prioritize usability and utility to foster positive attitudes. Thus, this study examines PU and PEU as sub-factors of AT and proposes the following hypothesis:

- *H13: AT toward Cryptocurrency positively affect CA.*

2.19. The mediator variables

2.19.1. Mediating Role of Crypto Trust (CT)

Hypothesis H8 suggests an indirect positive relationship between BC and CT (Benamati et al., 2010); (Arli et al., 2021); (Kumari et al., 2023); (Rahardja et al., 2023); (Norbu et al., 2024); (Pandurugan and Al Shammakhi, 2024). BC, which includes elements like financial literacy and perceived control, is instrumental in building user trust by reducing uncertainty and enhancing confidence in cryptocurrency systems. For example, Arli et al. (2021) highlights how behavioral control factors, such as familiarity and competence, directly influence trust in financial technologies.

While some research suggests a direct or weakly positive connection between CT and CA (Arli et al., 2021); (Mendoza-Tello et al., 2019); (Prakosa and Sumantika, 2022), others emphasize that trust alone may not guarantee adoption. Although previous studies have shown that BC impacts CA (Hypothesis H12) (Tavallaee et al., 2017); (Schaupp and Festa, 2018); (Mahardhika and Zakiyah, 2020); (Zamzami, 2020), the mediating role of CT has not been fully explored. Rahardja et al. (2023) demonstrated that CT acts as a mediator between intention to use and financial literacy, a key component of BC. This indicates that trust plays a crucial role in converting control into actionable adoption behaviors, especially in environments with limited user education and regulatory oversight, such as Vietnam. Since CT is a central theme of this paper, it further examines how CT influences the intention to invest in cryptocurrencies in Vietnam. Therefore, the following hypothesis is proposed:

- *H14: CT mediates the relationship between BC and CA.*

2.20. Mediating Role of Attitudes (AT)

CT positively influences CA, as shown in studies by Benamati et al. (2010) and CA (Arli et al., 2021); (Mendoza-Tello et al., 2019); (Prakosa and Sumantika, 2022) (discussed in Hypothesis H10). CT shapes user attitudes by enhancing perceptions of security, reliability, and legitimacy, which are particularly important in unregulated markets like Vietnam.

In addition, Gil-Cordero et al. (2020) found that AT contributes directly and positively to the intention to CA, while Almajali et al. (2022) suggest an indirect impact of AT on CA through factors such as PR, PU, PE, and PEU. This aligns with Shin (2019) who showed that CT positively influences AT by fostering confidence in cryptocurrency systems. However, Toufaily (2022) highlights that disintermediation and decentralization can both enhance and undermine trust, adding complexity to the relationship between CT and AT. For example, while decentralization promotes transparency, it can also introduce uncertainty about accountability, affecting user attitudes.

Turan et al. (2015) identified AT as a mediator between CA and the Unified Theory of TAM, which encompasses all elements of CT. Similarly, Almajali et al. (2022) found that AT mediates the connection between PU and PEU, both of which are influenced by CT (Benamati et al., 2010). These findings highlight AT's pivotal role in shaping the behavioral pathways from trust to adoption, particularly when user-centric factors like usability and enjoyment are involved. Building on this previous research, the following hypothesis is proposed for testing in the context of Vietnam:

- *H15: AT mediates the relationship between CT and CA.*

2.21. Mediating Role of External Environment (EX)

In DTT, both UC and the EX positively influence CT, as outlined in Hypotheses H3 and H5. However, according to SCT, Hypothesis H1 suggests that UC also positively impacts EX, creating a dynamic interaction between user traits and environmental factors. These relationships highlight the potential for EX to act as a mediator in trust-building processes.

Prior studies have examined EC factors, such as Government Support, as a moderator between Technology Awareness and Crypto Acceptance (Sagheer et al., 2022); (Shahzad et al., 2024). For example, regulatory clarity and financial education programs have been shown to enhance user trust and adoption rates in developing countries. Despite this, Marella et al. (2020) found no clear empirical evidence regarding the mediating role of Government Regulation (a component of EX) between CT and UC. This indicates a gap in understanding how environmental factors influence the trust-adoption pathway.

Given this gap, it is important to further investigate whether the EC plays a mediating or moderating role. In Vietnam, where the government plays an implicit but influential role in shaping the largely unregulated cryptocurrency market, understanding how EX mediates trust-building processes is particularly crucial. Notably, three clear pathways

have been established: UC to EX (H1), UC to CT (H3), and EX to CT (H6). Since both UC and EX are key components of ECT, understanding their interplay is critical. Thus, the following hypothesis is proposed:Table 1

- *H16: The EX mediates the relationship between CT and UC.*

3. Methodology

3.1. Scales measurement

The questionnaire was revised based on feedback from six experts, including three academic researchers specializing in financial behavior and blockchain technology, and three industry professionals with over five years of experience in cryptocurrency trading and financial investment. Their expertise ensured the questionnaire was comprehensive, clear, and aligned with the study's objectives. It was then tested on 15 diverse investors, primarily those with prior cryptocurrency trading experience, to validate the clarity of wording and content. This pilot test helped refine the survey to address any ambiguities or inconsistencies.

The survey is structured into four sections:

1. The first section contains questions about the respondents' personal information.
2. The second section allows participants to specify the type of investors they are.
3. The main content of the survey, found in sections three and four, includes 50 questions designed to measure levels of CT and financial investment behavior across seven factors, utilizing a 5-point Likert scale as summarized in Table 2 (See Appendix 2).

3.2. Data Collection

3.2.1. Convenience sampling method

Due to the unregulated nature of the cryptocurrency market in Vietnam, identifying suitable participants—individuals actively investing in or interested in cryptocurrency—poses a significant challenge. As a result, the convenience sampling method Jager et al. (2017), a non-probability sampling technique, was employed. This method involves selecting participants based on their accessibility and proximity to the researcher, aligning with the recommendations of Etikan (2016), who suggest that convenience sampling is practical for exploratory research in complex or emerging domains.

Table 1
Summary of all proposed hypotheses.

Hypothesis	Path Relation	Explanation
H1	UC ↔ EX	UC positively affects the EX of cryptocurrency trading, and vice versa.
H2	UC ↔ CA	UC positively influences CA, and a high intention to CA positively affects UC.
H3	UC → CT	UC positively affects CT.
H4	TC → CT	TC positively affects CT.
H5	EX → CT	EX positively affects CT.
H6	EX ↔ CA	EX positively impacts CA, and a high intention to CA positively influences EX.
H7	SN → CT	SN toward cryptocurrency positively affects CT.
H8	BC → CT	BC positively affects CT.
H9	SN → CA	SN toward cryptocurrency positively affects CA.
H10	CT → CA	CT positively affects CA.
H11	CT → AT	CT positively affects AT toward Cryptocurrency.
H12	BC → CA	BC positively affects CA.
H13	AT → CA	AT toward Cryptocurrency positively affect CA.
H14	BC → CT → CA	CT mediates the relationship between BC and CA.
H15	CT → AT → CA	AT mediates the relationship between CT and CA.
H16	UC → EX → CT	EX mediates the relationship between CT and UC.

Table 2
Measurement items.

Variables		Source
UC	UC1, UC2, UC3,RUC1, RUC2, RUC3	(Liu et al., 2016); (Lai, 2019); (Ozer and Mutlu, 2019)
TC	TC1, TC2, TC3, TC4, TC5,	(Benamati et al., 2010); (Shin, 2019)
EX	EX11, EX12, EX13, EX13, EX14, EX15, EX16EX21, EX22, EX23	(Morosan and DeFranco, 2016); (Albayati et al., 2020)
CT	CT1, CT2, CT3, CT4	(Shin, 2019), (Albayati et al., 2020)
SN	SN1, SN2, SN3	(Lai, 2019); (Morosan and DeFranco, 2016)
AT	AT11, AT12, AT13AT21, AT22, AT23AT31, AT32, AT33	(Albayati et al., 2020)
BC	BC11, BC12, BC13, BC14BC21, BC22, BC23	(Lai, 2019); (Albayati et al., 2020)
CA	CA1, CA2, CA3, CA4, CA5, CA6, CA7	(Schaupp and Festa, 2018)

While this approach is time-efficient and cost-effective, it inherently carries the limitation of potential sampling bias, as the sample may not fully represent the broader population. In this study, the sample was predominantly female and included a significant proportion of students, reflecting the demographic characteristics of respondents who were more readily accessible through professional networks, academic institutions, and social media platforms. Although this composition may skew the findings, it provides valuable preliminary insights into the attitudes and behaviors of these demographics toward CA, which are critical for exploratory research.

The decision to focus on personality traits as part of the study aligns with prior research that links traits like openness, conscientiousness, and risk-taking with investment behavior (Costa, McCrae 2010), (Kumari et al., 2023). However, the direct impact of personality traits on CA was not examined in this study to maintain the focus on behavioral control, trust, and environmental factors. These constructs were prioritized as they are more directly actionable for stakeholders aiming to promote CA in Vietnam's unique market context.

In summary, while convenience sampling has limitations in representativeness, its use in this study is justified by its efficiency in gathering data from a hard-to-reach population. This approach is particularly suitable for exploratory research in unregulated or emerging markets, where understanding general trends and behaviors takes precedence over statistical generalizability (Taherdoost, 2016).

3.3. Sample Size and Data collection

According to Hair et al. (2017), the minimum sample size required for conducting Exploratory Factor Analysis is 50, although a sample size of 100 or more is preferable. The recommended ratio of observations to each variable analyzed typically ranges from 5:1–10:1, although some researchers advocate for a ratio as high as 20:1. Here, "number of observations" refers to the number of valid survey responses required, while "measured variable" corresponds to a specific question in the survey.

In this model, the authors' survey consists of 50 questions, each using a 5-point Likert scale, corresponding to 50 observed variables across different factors. These 50 questions are analyzed together in a single Exploratory Factor Analysis. Using a 5:1 ratio of observations to variables, the minimum required sample size would be $50 \times 5 = 250$. For a 10:1 ratio, the maximum sample size would be $50 \times 10 = 500$. Since both sample sizes exceed the general minimum requirement of 50 or 100 participants, the study needs at least 250 respondents to perform EFA, with a potential maximum of 500, depending on the chosen ratio based on the survey's feasibility.

The data for the questionnaires is collected using Google Forms and distributed to four main groups: university and college students, particularly those majoring in finance and technology; members of

foreign business associations; group of logistics companies, and Food & Beverage companies. The selected companies are all involved in export and import activities, making them likely to be open-minded and up to date with new financial instruments. The Google Form is presented in Vietnamese. However, during the pilot study, the authors noticed that some terms were unclear when translated into Vietnamese, particularly for respondents who has never traded cryptocurrencies before. Consequently, certain terms in a few questions needed to be simplified and supplemented with examples for clarity. Once confirmed that the survey was clear and free of issues, it was distributed to other respondents via email, Zalo, a link, or a QR code.

Data collection took place between January and March 2024. To ensure effective survey results, the authors personally engaged with key individuals, clearly explaining the purpose of the survey. Those who had already traded cryptocurrency showed interest in the topic and were eager to participate, hoping to highlight the importance of government involvement. Leveraging their connections with various enterprise associations, the authors facilitated the distribution of the survey forms to others interested in cryptocurrency. As an incentive, small gifts were offered to encourage these individuals to share the survey further. While young participants with less than a year of crypto-trading experience were enthusiastic to join, eager to learn more about the field. Drawing on authors' extensive teaching experience, we distributed the survey across at least five universities and colleges, clarifying to each class who was eligible to participate. Gifts were also used as motivation for students to spread the survey among their peers.

3.4. Data Analysis Technique

After collecting sufficient data in the second stage, the research applies Partial Least Squares Structural Equation Modeling with SmartPLS 4.0 software to analyze the data. Importantly, it is used to check Cronbach's alpha to ensure the measurement instrument 's reliability and the scale's consistency. SmartPLS is specifically designed for PLS-SEM, making it ideal for cases where the data is not normally distributed or when conducting theoretical development in exploratory research. This software is particularly useful for testing the stability of results through robust techniques like bootstrapping to test the moderating role. Additionally, SmartPLS can assess both the reliability (Anderson and Gerbing, 1988); (Gefen et al., 2000), and validity of constructs, evaluate the overall fit of the model, and predict the model's relevance.

4. Data analysis

4.1. Descriptive statistics

The survey data shows that 57 % of respondents are female and 43 % are male. Most (51 %) are aged 21–30, while 19 % are under 20, 20 % are 31–40, and 10 % are 41–50. Regarding education, 58 % hold a bachelor's degree, 16 % a master's, 7 % completed high school, 2 % have a PhD, and 17 % fall under "Others."

In terms of job titles, 51 % are students, 20 % officers, 8 % team leaders, 6 % graduates, and 1 % managers. Trading experience varies, with 65 % having less than a year, 13 % with 1–2 years, and smaller percentages in higher experience brackets.

Additionally, 59 % have cryptocurrency trading experience, while 41 % do not. Among investor personality traits, Conscientiousness (58 %) is the most common, followed by Neuroticism (17 %), Extraversion (14 %), Agreeableness (8 %), and Openness (2 %). Table 3

Table 3
Demographic information.

Criteria	Description	Number of Respondents	Percentage
Gender	Female	141	57 %
	Male	109	43 %
Age	< 20	48	19 %
	21–30	126	51 %
	31–40	51	20 %
	41–50	24	10 %
Education	High school	18	7 %
	Bachelor	145	58 %
	Masters	39	16 %
	PhD	6	2 %
	Others	42	17 %
Job title	Team leader	21	8 %
	Students	126	51 %
	Officers	51	20 %
	Managers	3	1 %
	Graduates	15	6 %
Trading experience	< 1 year	163	65 %
	1–2 years	33	13 %
	2–5 years	21	8 %
	5–10 years	18	7 %
	10–20 years	15	6 %
Crypto trading experience	Yes	148	59 %
	No	102	41 %
Investor types	Openness	6	2 %
	Extraversion	36	14 %
	Conscientiousness	145	58 %
	Neuroticism	42	17 %
	Agreeableness	21	8 %

4.2. Reliability and AVE

In this study, all outer loadings exceed 0.7, indicating a strong correlation between indicators and their respective constructs (Hair et al., 2017). In terms of, the AVE for both CA (0.718), and for TC (0.761) are all above 0.5, which exhibit strong reliability and validity, providing a solid foundation for further analysis (Wynne, 1998). Furthermore, composite reliability (CR) (Ab Hamid et al., 2017), all constructs, such as Crypto Adoption (CR = 0.938), UC (CR = 0.836), and TC (CR = 0.941), meet this criterion (> 0.70) indicate satisfactory internal consistency reliability. According to Peterson et al. (1994); Hair et al. (2017), all items' Cronbach's Alpha above 0.7 are accepted, especially CA, TC, EX, AT, BC above 0.9 show the excellent estimation of reliability. Table 4

4.3. Discriminant validity

According to the rule of thumb (Henseler et al., 2014), HTMT values should generally be below 0.90, and in more stringent contexts, values should be less than 0.85. In the matrix, most of the HTMT values meet these criteria, except for the value between SN and CT, which is 0.963, exceeding the threshold of 0.90. However, this minor violation of discriminant validity is relatively insignificant when compared to the other eight constructs, which demonstrate sufficiently distinct relationships. As shown in Table 5, the results remain usable, with the majority of constructs meeting the necessary criteria.

4.4. Model Fit Assessment and Structural model

To ensure the robustness of the measurement model, we evaluated model fit indices generated using PLS-SEM. While Confirmatory Factor Analysis (CFA) was not conducted as a standalone step, key indices confirm the model's validity (Table 6):

- SRMR (Standardized Root Mean Square Residual): 0.086 (saturated) and 0.158 (estimated), indicating an acceptable model fit.
- Chi-Square: 1842.031 (saturated) and 1914.013 (estimated), reflecting alignment between observed and model-implied covariance.
- NFI (Normed Fit Index): 0.579 (saturated) and 0.563 (estimated), suggesting moderate fit.
- d_ULS and d_G: Further support model consistency with values of 24.633 (d_ULS) and 6.160 (d_G) for the estimated model.

Table 4
Reliability and descriptive statistics.

Indicators	Outer loading	AVE	CR	Cronbach's Alpha
CA		0.718	0.938	0.920
CA1	0.745			
CA2	0.859			
CA3	0.848			
CA4	0.879			
CA5	0.901			
CA6	0.844			
UC		0.630	0.836	0.690
UC1	0.826			
UC2	0.814			
UC3	0.738			
TC		0.761	0.941	0.921
TC1	0.808			
TC2	0.884			
TC3	0.883			
TC4	0.895			
TC5	0.889			
EC		0.638	0.933	0.918
EX11	0.709			
EX12	0.862			
EX13	0.814			
EX14	0.860			
EX15	0.758			
EX21	0.782			
EX22	0.789			
EX23	0.795			
CT		0.706	0.905	0.859
CT1	0.801			
CT2	0.899			
CT3	0.782			
CT4	0.872			
SN		0.693	0.871	0.778
SN1	0.899			
SN2	0.826			
SN3	0.779			
AT		0.650	0.943	0.932
AT11	0.773			
AT12	0.789			
AT13	0.855			
AT21	0.802			
AT22	0.887			
AT23	0.813			
AT31	0.852			
AT32	0.711			
AT33	0.759			
BC		0.733	0.943	0.927
BC11	0.864			
BC13	0.863			
BC14	0.884			
BC21	0.796			
BC22	0.875			
BC23	0.851			

Table 5
Discriminant validity – Heterotrait-monotrait and Fornell-Lacker criteria.

	AT	BC	CA	CT	EX	SN	TC	UC
AT	0.806	0.732	0.808	0.708	0.762	0.843	0.636	0.729
BC	0.688	0.856	0.760	0.608	0.661	0.595	0.624	0.761
CA	0.763	0.712	0.848	0.592	0.667	0.684	0.523	0.710
CT	0.644	0.546	0.541	0.840	0.767	0.963	0.789	0.734
EX	0.715	0.617	0.621	0.691	0.798	0.711	0.672	0.729
SN	0.721	0.512	0.590	0.802	0.608	0.833	0.754	0.647
TC	0.590	0.577	0.491	0.709	0.621	0.653	0.873	0.756
UC	0.604	0.617	0.580	0.572	0.594	0.483	0.604	0.794

Note: HTMT values are above the diagonal, while Fornell-Larcker criteria are below the diagonal and on the diagonal (square root of AVE in bold).

These indices, combined with reliability and validity measures (Cronbach's alpha, AVE, and Fornell-Larcker), confirm the robustness of our model. While PLS-SEM was chosen for its suitability in exploratory studies and complex models, future research may integrate CFA to further enhance validation.

Table 6
Model Fit Summary.

Index	Saturated Model	Estimated Model	CA	CT
SRMR	0.086	0.158	-	-
d_ULS	7.321	24.633	-	-
d_G	5.494	6.160	-	-
Chi-Square	1842.031	1914.013	-	-
NFI	0.579	0.563	-	-
R-Square	-	-	0.658	0.631
R-Square Adjusted	-	-	0.738	0.721

According to Hair et al. (2017), R^2 values above 0.75 are considered substantial, around 0.50 moderate, and around 0.25 weak. As shown in Table 6, the model fits moderately well for AT and EX, and strongly for CA and CT. R^2 also offers insight into the explanatory power of the independent variables on each dependent construct. As shown in Table 7, the CT with the R^2 value of 0.738 indicates that 73.8 % of the variance in CT is explained by the model's predictors, which is a strong level of explanatory power. Similarly, CA with R^2 of 0.658 means 65.8 % of its variance is accounted for by variables such as AT and CT. These high R^2 values suggest that the model effectively captures the key factors influencing CT and adoption, providing a solid foundation for the study's conclusions.

4.5. Hypothesis testing

To determine significant path coefficients, all the study's hypotheses were analyzed using p-values (below 0.05) and t-statistics (above 1.96), as recommended Fisher (1922) and Hair et al. (2017). The path coefficients for the structural relationships were calculated in Figure 4, with the results summarized in Table 8, which presents the complete findings of the structural model and hypothesis testing.

The findings show that hypotheses H3, H5, H7, H9, H11, H12, and H13 were supported, showing that UC, EX, SN, BC, and AT significantly influence CT and CA. Notably, H7 (SN → CT) had a strong effect, highlighting the role of social influence on trust in cryptocurrencies. However, H4 (TC → CT), H8 (BC → CT), and H10 (CT → CA) were rejected, suggesting that TC and BC do not strongly affect trust, and that CT alone does not directly lead to adoption. These results provide insights into the key factors shaping CT and adoption.

The data in Table 7 also presents the hypothesis testing results for the co-effects in Social Cognitive Theory, specifically examining the relationships between UC, EX, and CA. All three hypotheses (H1, H2, H6) are strongly supported, with high significance levels ($p = 0.001$), indicating robust connections between these variables. In addition, Figure 5 visually illustrates these relationships, showing the path coefficients and measurement indicators for each construct. Most of the indicators,

Table 7
Structured estimated (Hypothesis testing).

Hypothesis	Path Relation	Path Coeff.	T-Statistics	p-Value	Result
H1	UC ↔ EX	0.675	3.884	0.000	Supported* **
H2	UC ↔ CA	0.624	3.307	0.001	Supported* **
H3	UC → CT	0.218	2.231	0.026	Supported*
H4	TC → CT	0.201	1.940	0.053	Rejected
H5	EX → CT	0.217	2.316	0.021	Supported*
H6	EX ↔ CA	0.568	3.506	0.001	Supported* **
H7	SN → CT	0.504	5.166	0.000	Supported* **
H8	BC → CT	−0.017	0.216	0.829	Rejected
H9	SN → CA	0.207	2.212	0.027	Supported*
H10	CT → CA	0.177	1.089	0.276	Rejected
H11	CT → AT	0.644	7.150	0.000	Supported* **
H12	BC → CA	0.318	3.035	0.001	Supported* **
H13	AT → CA	0.418	3.302	0.001	Supported* **

Note: (*** p = 0.001; ** p = 0.01; * p = 0.05)

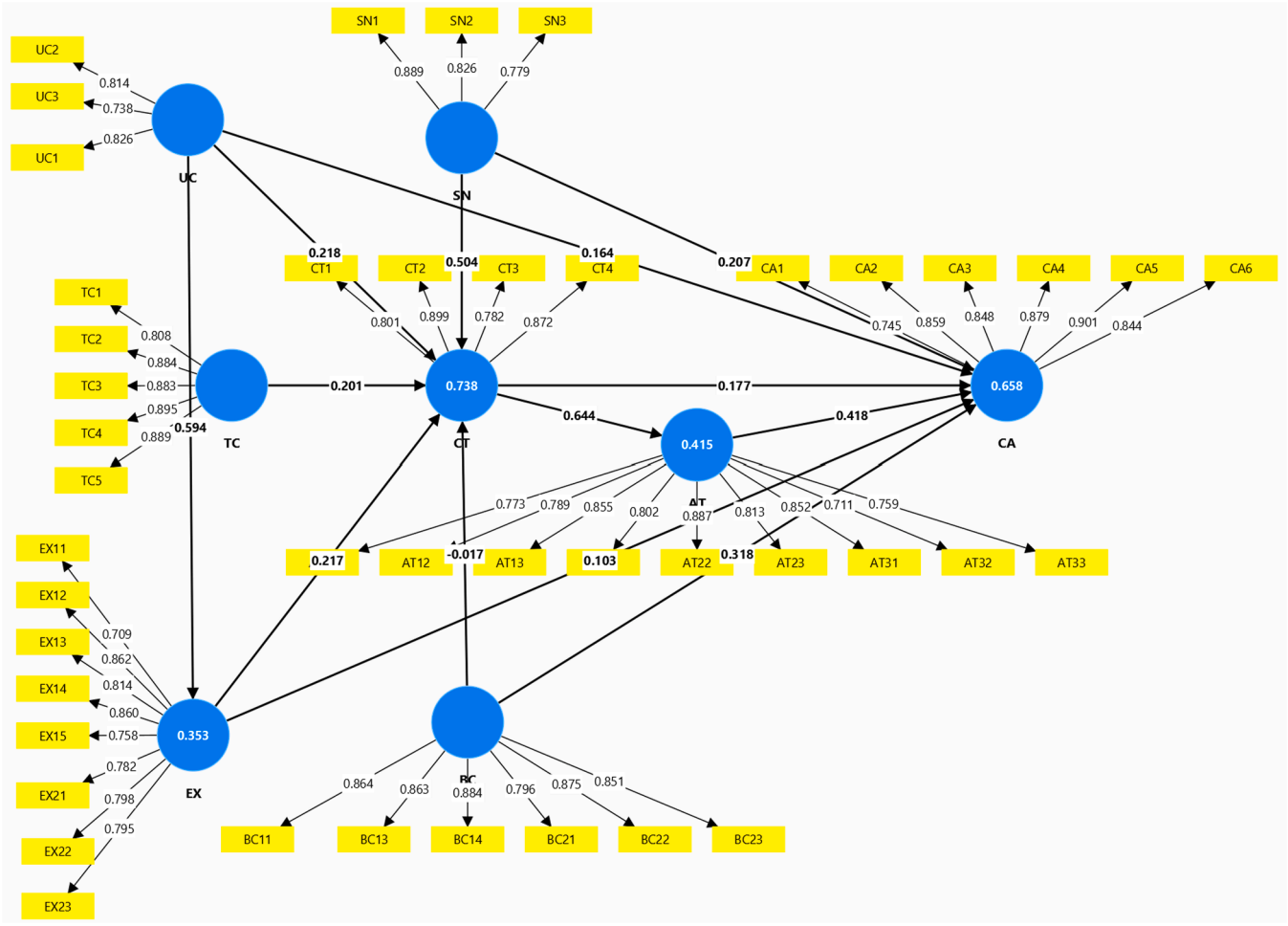

Fig. 4. Structural model.

Table 8
Total effect.

Hypothesis	Direction of impacts	Original sample (O)	T statistics (|O/STDEV|)	p	Results
H14	BC→ CT → CA	0.002	0.143	0.886	No mediation
H15	CT → AT → CA	0.269	3.022	0.003	No mediation
H16	UC → EX → CT	0.129	2.143	0.032	Partial mediation

except for UC2, UC3, and CA1, have factor loadings mostly above 0.7, confirming good reliability in measuring the latent variables.

4.6. Mediation Analysis

Bootstrapping is widely regarded as one of the most rigorous and robust methods for evaluating mediation effects, and it has gained increasing recognition among scholars (Zhao et al., 2010). In this study, Smart PLS 4.0 was employed to analyze the mediating roles of CT, AT, and EX. Both direct and indirect effects of these mediators were examined.

As seen in Table 7, a significant direct relationship exists between BC and CA ($p = 0.001$) supporting Hypothesis H12, as well as between UC and CT ($p = 0.026$), confirming Hypothesis H3. These direct relationships remain significant. However, Hypothesis H10, which proposed a direct relationship between CT and CA, was rejected, as the p-value exceeded the 0.05 threshold (Fisher, 1922), indicating that CT does not directly influence CA.

Table 8 presents the results of the mediation analysis using the Variance Accounted For (VAF) method (Nitzl et al., 2016). Of the mediation hypotheses, only Hypothesis H16 is supported, showing that EX partially mediates the relationship between UC and CT, with a VAF value of 0.592. The other mediation effects—Hypothesis H14 (BC → CT → CA) and Hypothesis H15 (CT → AT → CA)—show no significant mediation, as their VAF values indicate no mediation. This highlights the partial mediation role of EX in influencing the relationship between UC and CT.

4.7. Discussion of findings

The study confirmed the influence of SN, AT, and BC on CA, consistent with previous research such as, Tavallaee et al. (2017); Schaupp and Festa (2018); Mendoza-Tello et al. (2019); Mahardhika and Zakiyah (2020); Zamzami (2020); Almajali et al. (2022); Prakosa and Sumantika (2022); Illia et al. (2023); Pandurugan and Al Shammakhi (2024).

However, unlike earlier studies Shin (2019), Koroma et al. (2022), Illia et al. (2023), it found no direct relationship between TC and CT, likely due to the limited adoption of unpopular CT in Vietnam.

Moreover, the study rejected the direct relationship between BC and CT, as well as CT and CA, similar to findings by some researchers Mendoza-Tello et al. (2019); Pandurugan and Al Shammakhi (2024); Kumari et al. (2023); Arli et al. (2021); Rahardja et al. (2023); Norbu et al. (2024) but contrasting with other Prakosa and Sumantika (2022).

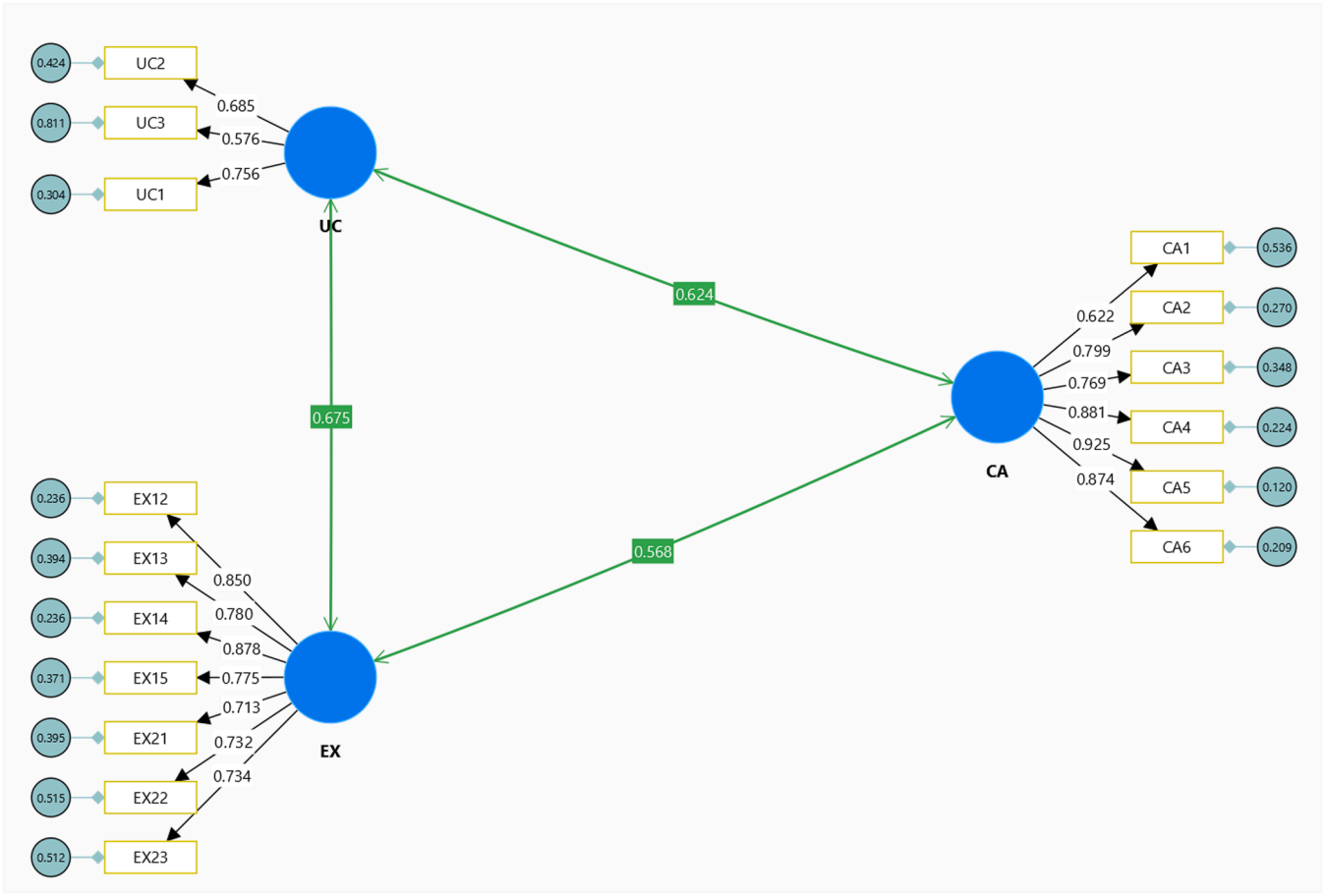

Fig. 5. Co-effect Model Representation in SCT.

This suggests that in Vietnam, despite trust in crypto, many cautious investors hesitate to adopt due to the lack of regulation. This may be due to the fact that 58 % of the young participants in this study are conscientious investors. Additionally, the mediating role of Attitude between CT and CA, found in previous research Shin (2019); Albayati et al. (2020); Prakosa and Sumantika (2022), was not observed in this study. Interestingly, the study highlighted the partial mediating role of the EC, particularly government support, in the relationship between UC and CT, which aligns with recent research Sagheer et al. (2022); Shahzad et al. (2024), but was not noted in older study Marella et al. (2020).

5. Conclusion and Implications

5.1. Conclusion,

As technology continues to evolve, the adoption of cryptocurrency remains a critical area of study, especially in developing countries like Vietnam. The adoption process in Vietnam is shaped by a complex interaction of trust, social cognition, SN, attitude, and behavioral control. These findings align with previous studies Mendoza-Tello et al. (2019); Pandurugan and Al Shammakhi (2024); Kumari et al. (2023); Arli et al. (2021); Rahardja et al. (2023); Norbu et al. (2024), yet the significance of these factors varies. UC, EC, and Behavioral Control all show a strong positive correlation with CA, with p-values consistently below 0.001, affirming their importance.

One of the most intriguing findings is the exclusion of TC from building CT. While past research Shin (2019), Marella et al. (2020); Arli et al. (2021); Koroma et al. (2022); Norbu et al. (2024) demonstrated a positive relationship between sub-factors of TC—such as transparency, security, and reliability—and CT, this study found no such link when these sub-factors were grouped under one variable. This suggests that Vietnamese investors may trust cryptocurrency despite lacking a deep understanding of blockchain's technological attributes, relying instead on other factors to inform their decisions.

Moreover, the study examined the mediating roles of CT, AT, and EX, with only the mediating effect of EX being confirmed. Interestingly, the partial mediation of EX, particularly government support, in the relationship between UC and CT emphasizes the critical role of regulatory frameworks. This highlights the growing urgency for the Vietnamese government to align with investor expectations and provide clearer regulations, which could further strengthen trust in cryptocurrency.

5.2. Managerial Implications

5.2.1. Theoretical Implications

This study not only aligns with but also extends well-established consumer behavior theories, including TRA, TPB, TAM, and SCT. While these theories have long been applied across diverse domains such as consumer goods, finance, banking, and logistics, this research updates and adapts them for the evolving digital financial landscape in Vietnam. The integration of all these frameworks offers a deeper understanding of CA in a region with unique challenges, such as an unregulated crypto market and increasingly sophisticated individual investors.

Unlike many previous studies that combined TRA, TPB, and TAM into a single model, this research takes a bold step by incorporating SCT to better capture the dynamic and complex behaviors of modern investors in an unregulated environment. The paper introduces a novel application of SCT, exploring the co-effects among UC, EX, and CA in Vietnam's digital financial market. This interaction reflects the nuanced reality of cryptocurrency markets, where factors like regulatory

uncertainty and individual experiences can have intertwined effects on adoption behaviors. This triangle of interaction is particularly relevant as cryptocurrencies continue to operate in an unregulated space, further emphasizing the importance of understanding these factors in shaping investor behavior.

One key finding of this study is the significant indirect influence of CT on Cryptocurrency Intention via Attitude. While the study did not find a direct impact of CT on Cryptocurrency Intention, it revealed that CT significantly influences Attitude, a key precursor to investment decisions. This finding provides actionable insights into how trust-building efforts can be strategically targeted to shape attitudes, ultimately driving adoption decisions. For decision-makers, it highlights the importance of focusing on attitudinal shifts through public campaigns or educational initiatives to foster a supportive environment for CA.

Given the moderate academic focus on Vietnam's cryptocurrency market, this study makes an important contribution by highlighting the partial mediating role of the EC in trust formation—an area often overlooked in previous research. By confirming that TC and behavioral control have limited influence in developing markets like Vietnam, the study underscores the need for region-specific theoretical models to better understand CA. For policymakers, this suggests that theoretical insights from other contexts may need adaptation to address Vietnam's unique sociocultural and economic conditions. Moreover, with a young and tech-savvy population, Vietnam's case can provide meaningful insights into the global financial market and offer valuable lessons for other emerging economies.

5.2.2. Policymakers and decision-makers Implications

The evolving concept of DT, though not new, takes on fresh relevance in the context of CA, as highlighted in this study. This research identifies three key dimensions influencing trust: TC such as transparency, security, and reliability; UC, including effort and performance expectancy and vicarious experience; and the EX, with factors like government regulation and facilitating conditions. This multidimensional perspective underscores the interconnected nature of trust-building in cryptocurrency markets, offering actionable strategies for decision-makers.

While prior studies emphasize the intersection of all three dimensions in building trust, this study reveals that in Vietnam, UC and EX play a much more significant role, whereas TC have no impact. This finding indicates that in emerging markets, trust development hinges more on contextual and experiential factors rather than technological innovation alone. Decision-makers, including regulators and industry stakeholders, should prioritize these aspects to foster wider CA.

For policymakers in Vietnam, this means that government support and regulatory frameworks are essential in strengthening trust in cryptocurrencies, particularly in an unregulated environment. The partial mediation of the XC between UC and trust suggests that without strong government intervention, trust in cryptocurrency will be difficult to establish and sustain. This is a critical takeaway for policymakers: trust-building is not solely a market-driven process but requires a collaborative approach involving clear regulations, public education, and technology accessibility.

In addition to regulatory action, financial advisors can use these findings to better understand the diverse demographics of cryptocurrency users—from students to business owners, spanning various age groups. By tailoring investment strategies to align with the psychological profiles and trust levels of their clients, advisors can boost satisfaction and enhance financial outcomes. For example, understanding the role of vicarious experience in building trust can help financial advisors design targeted campaigns or tools that highlight success stories and relatable investor journeys.

More broadly, this research reintroduces the concept of cryptocurrency to Vietnamese citizens within a modern context, potentially aiding the government in developing sound policies on cryptocurrency. With Vietnam's young, tech-savvy population and its rapid technology adoption, the country is well-positioned to seize the opportunities presented by digital assets. However, if the government fails to act, these opportunities may be lost, leading to missed economic benefits and a lag in financial innovation.

In the short term, as the government works towards a regulatory framework, financial advisors and individual investors can cultivate greater confidence in technology, reassured by a clearer path forward. Increased confidence among investors can lead to greater participation in the digital financial ecosystem, driving both innovation and economic growth. For decision-makers, this underscores the need for immediate action to create an enabling environment that supports these outcomes. By embracing cryptocurrency with the right policies and strategies, Vietnam can pave the way for a robust, tech-driven financial future.

5.3. Limitations of the research

The sample is limited to 250 individual investors residing in Vietnam. Consequently, the sample may not fully represent the diverse population of Vietnamese investors, limiting the generalizability of the findings.

Additionally, the study did not fully explore the potential differences in CA between respondents with and without crypto-trading experience, which could have led to different insights and policy recommendations

Furthermore, the literature review suggests that the five-trait personality theory could be incorporated into the SCT, the authors were unable to include this in the model. This limitation arose because the existing questionnaire was already time-consuming, making it difficult to gather a sufficiently large sample. Consequently, the study treats investors' personal traits separately from other key variables.

5.4. Future research direction

Future research should expand the sample to include other major urban cities in Vietnam for more representative results and could also explore similar studies in other developing countries. One potential direction is to focus separately on investors with and without cryptocurrency trading experience, as these groups may have different behaviors. Moreover, incorporating the five-trait personality theory into future models would provide deeper insights into investor behavior. Research could also investigate the role of TC in more developed markets where CT is more established. Furthermore, studying the impact of varying government policies on CA across different countries, as well as integrating psychological factors such as risk tolerance and personality traits, would offer a more comprehensive understanding of CA behaviors.

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Ethical Statement

The authors confirm that the research presented in this paper complies with the ethical standards of the relevant institutional and national guidelines for human or animal subjects, if applicable. Informed consent was obtained from all participants involved in the study, and their confidentiality and anonymity were maintained throughout the research process. No ethical approval was required for this study.

CRediT authorship contribution statement

Pham Van Kien: Writing – review & editing, Supervision, Investigation, Formal analysis, Conceptualization. **Nguyen Tran Le:** Writing – original draft, Funding acquisition, Conceptualization. **Juraj Sipko:** Validation, Supervision, Project administration, Methodology.

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Appendix

Appendix 1: The abbreviations used in the study

Abbreviation	Full Form
AI	Artificial Intelligence
AT	Attitudes toward Cryptocurrency
AVE	Average Variance Extracted
BC	Behavioral Control
CA	Cryptocurrency Adoption
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
CT	Cryptocurrency Trust
DTT	*Digital Trust Theory*
DeFi	Decentralized Finance
EX	External Environment
FL	Financial Literacy
NFI	Normed Fit Index
PE	Perceived Enjoyment
PEOU	Perceived Ease of Use
PR	Perceived Risk
PU	Perceived Usefulness
SEM	Structural Equation Modeling
SCT	Social Cognitive Theory
SI	Social Influence
SN	Subjective Norms
SRMR	Standardized Root Mean Square Residual
TAM	Technology Acceptance Model
TC	Technology Characteristics
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology

Appendix 2: Role of experts in pilot test

Expert	Expertise	Role/Experience	Contribution
Expert 1	Academic in Financial Behavior	Professor with 10 + years of experience in financial behavior research	Provided insights into structuring behavioral questions
Expert 2	Academic in Blockchain Technology	Associate Professor specializing in blockchain applications with 8 + years of research experience	Ensured technical relevance of blockchain-related items
Expert 3	Academic in Investment Strategies	Lecturer with extensive research on investment behavior and technology adoption	Reviewed investor segmentation criteria
Expert 4	Industry Professional (Cryptocurrency)	Cryptocurrency trader and consultant with 7 years of experience in blockchain investments	Validated practical applicability of cryptocurrency terms
Expert 5	Industry Professional (Financial Analyst)	Senior financial analyst specializing in digital assets and investment behavior for 6 + years	Ensured content relevance for cryptocurrency investors
Expert 6	Industry Professional (Blockchain Expert)	Blockchain developer and strategist with 5 + years of experience working on cryptocurrency projects	Evaluated the clarity of technical blockchain questions

Appendix 2: Questionnaire

Dear Sir/Madam,

This survey targets individuals who are currently investing in cryptocurrency or planning to invest in it in the future. Most cryptocurrencies, such as Bitcoin and Ethereum, are forms of digital currency based on blockchain technology.

All survey respondents' information will be kept strictly confidential. The results of this survey will contribute to a better understanding of cryptocurrency and will inform government policies regarding the regulation of cryptocurrency in Vietnam.

We kindly ask you to spend approximately 15 min to ensure that your responses accurately reflect your thoughts as you participate in the project survey titled " Cryptocurrency in Vietnam: A Deep Dive into Adoption Factors and Their Interactions". The author sincerely thanks you for your time and cooperation.

GENERAL INFORMATION:

1. Gender: Male/ Female
2. Age: < 20; 21–30; 31–40; 41–50; 51–60; > 60
3. Education: High school or equivalent; Bachelor, Master, PhD and Above, Other

4. Marital status: Married, Single
5. Job title: Entry level, Associate, Director, Manager, Other
6. Trading experience (excluded cryptocurrency): < 1 years; 1–2 years; 2–5 years; 5–10 years; 10–20 years; > 20 years
7. Cryptocurrency-trading experience: yes/ no

DT Theory		
PART 1: WHAT IS YOUR KIND OF INVESTORS?		
Please read through the 15 sentences below and see which of the following 5 types of investors you belong to:		
A. Extraversion		
B. Agreeableness		
C. Conscientiousness		
D. Neuroticism		
E. Openness		
5 personality traits	Extraversion	I like to talk to strangers about cryptocurrency.
		I think I am curious about new things like blockchain, cryptocurrency
		I feel very comfortable myself in the cryptocurrency community.
	Agreeableness	I can feel others' feelings and troubles when they invest
		Some people think of me as a cold and calculating investor
		I feel excited every time I invest in cryptocurrency
	Conscientiousness	I'm always ready to take responsibility for investing in cryptocurrency
		I fulfill responsibility for my investment on time.
		I make plans for cryptocurrency investment and stick to them.
	Neuroticism	I'm easily stressed by cryptocurrency investment
		I'm easily disturbed during cryptocurrency investment.
		My mood is very variable.
	Openness	I often try new investments.
		I want to be the first to try cryptocurrency investment.
		I am open to investing in cryptocurrency.
Please answer the following questions according to the following scale:1: Strongly disagree2: Disagree3. Neither Agree nor Disagree4. Agree5. Strongly AgreePART 2: HOW MUCH DO YOU TRUST CRYPTOCURRENCY?		
UC (UC)Psychological and personal factors	-Vicarious experience-Hedonic Cognitive-Perfomance Expectancy-Effort Expectancy-Hedonic Motivation-Habit-Technophobia	The crypto trading is exciting based on vicarious experience
		I think trading cryptocurrency increases the chances of getting something significant.
		Trading cryptocurrency has become my habit
		I am addicted to trade cryptocurrency
		I fear not knowing where to start and rejection when trading cryptocurrency
		I am afraid of being interrupted when trading cryptocurrency
		I fear anxious every time I trade cryptocurrency
Tech characteristics (TC)	TransparencySecurityReliability	Cryptocurrency supply chain processes are transparent to me
		Applications of cryptocurrency are well described to me
		I am confident that the private information I trade crypto will be secured
		I think cryptocurrency is a very reliable product.
		To me, a cryptocurrency trading platform is extremely dependable.
Contextual/ EC (EX)	EX1: Government regulations/ Regulation support	I believe if the government supports cryptocurrency regulations, that will incentivize using cryptocurrencies.
		I believe if the government regulates and monitors cryptocurrency, that will reduce the risks associated with using cryptocurrencies.
		I believe the government should support and/or be responsible for regulating the use of cryptocurrencies.
		I believe that regulations and government insurance should exist to protect the users of cryptocurrencies.
		I believe that the role of the government is crucial in adopting cryptocurrency.
		I believe that the illegal trading of cryptocurrency in Vietnam makes people not trust in cryptocurrency.
	EX2: Facilitating Condition	I have the required and necessary resources (information, supporters…) to use cryptocurrencies
		I can get assistance if I'm having trouble using cryptocurrencies.
		I find buying or selling cryptocurrency on smart phone easy
ECT (CT)	CT1	I believe that electronic payments made with cryptocurrencies are integral in the future.
	CT2	I believe that cryptocurrency is a reliable and secure form of currency.
	CT3	Blockchain is a trustworthy service
	CT4	I trust the benefits of investments in cryptocurrency.
TAM + TRA theory		
PART 3: FINANCIAL INVESTMENT BEHAVIOR		
Subjects Norms (SN)	SN1	I will adopt cryptocurrency trading if my family members/relatives use it.
	SN2	I will invest in cryptocurrency if many people in my community or among my friends do.
	SN3	In general, crypto communities have supported me in trading cryptocurrency.
	SN4	Mass media influence me to invest in cryptocurrency.

(*continued on next page*)

(*continued*)

DT Theory		
Attitude (AT)	AT1: Attitude	Investment in a cryptocurrency market is a wise choice I find cryptocurrency investment attractive. Using cryptocurrency would be a pleasant experience.
	AT2: Crypto Usefulness (CU)	I find that cryptocurrency is not bound by time and location, which is convenient for me I find cryptocurrency to be a useful tool for financial transactions. Using cryptocurrencies allows me to send and receive money quickly
	AT3: Crypto Ease of Use (EU)	I find the cryptocurrency system user-friendly I find downloading applications related to cryptocurrency straightforward I find trading the cryptocurrency process easy.
Behavior Control (BC)	BC1: Financial literacy	I have sufficient financial knowledge of cryptocurrency. I know illegal cryptocurrency trading will decrease the government's tax revenue. I follow the cryptocurrency news I know the transaction process of cryptocurrency.
	BC2: Perception Behavior Control	I would be able to use cryptocurrency well. Using cryptocurrency is within my control I have good experience in conducting transactions through blockchain/ cryptocurrency systems (Application).
Crypto Intention/ Adoption (CA)	CA1	I am familiar with the concept of cryptocurrency
	CA2	I believe I can adopt cryptocurrency
	CA3	I use cryptocurrency because it benefits my finances.
	CA4	If there is legal regulation of cryptocurrencies, I will share knowledge of cryptocurrency with clients, friends, and acquaintances
	CA5	If there is legal regulation of cryptocurrencies, I intend to use cryptocurrency at some point in the future.
	CA6	I want to trade cryptocurrencies legally, just like other investment channels such as stocks

Mediating Role Analysis of AT:

- Q13: To what extent does your trust in cryptocurrency influence your attitude towards it? (Scale: 1 - No influence, 5 - Strong influence)
- Q14: How much does your attitude toward cryptocurrency affect your decision to adopt it? (Scale: 1 - Not at all, 5 - Completely)
- Q15: Do you believe that your attitude towards cryptocurrency mediates the relationship between your trust in it and your adoption of it? (Scale: 1 - Strongly disagree, 5 - Strongly agree)

Mediating Role Analysis of CT:

- Q20: To what extent does your trust in cryptocurrency mediate the relationship between your personal characteristics and your attitude toward it? (Scale: 1 - Not at all, 5 - Completely)
- Q21: How much does trust in cryptocurrency influence the relationship between TC and your attitude? (Scale: 1 - No influence, 5 - Strong influence)
- Q22: How significantly does trust in cryptocurrency mediate the impact of ECal factors on your attitude toward cryptocurrency? (Scale: 1 - Not significant, 5 - Very significant)

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