

Understanding Cryptocurrency Adoption Decisions in Thailand: Risk Perception and Risk Management Capabilities

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ABSTRACT

Consumer adoption of cryptocurrency is still in its infancy. One impeding factor is that cryptocurrency is a high-risk asset. Owning the currency potentially increases consumers' financial profile uncertainty. On the contrary, this study argues that cryptocurrency adoption can be a risk management strategy. Prospect theory from a risk perception perspective is used to motivate the argument. A set of six hypotheses based on risk perception and risk management capabilities was developed. This study collected secondary cryptocurrency adoption data from more than 4,600 subjects from 2020 to 2024 in Thailand. The statistical results reveal the effects of generations, economic conditions, and digital financial expertise. The implications include theoretical reassessment of risks associated with high-uncertainty assets and appropriate public education and communication regarding cryptocurrency adoption.

Keywords: Cryptocurrency adoption, risk perception, prospect theory, Thailand.

INTRODUCTION

Cryptocurrency is a digital form of money that uses digital encryption for security. It operates independently from central banks. This innovative medium of exchange is changing financial markets and challenging traditional monetary systems. Despite its potential, many consumers have not yet adopted cryptocurrency. The low adoption rate is mainly due to perceived risks. These risks include online scams, uncertain regulations, and price fluctuations (Almeida *et al.*, 2022). The slow adoption of this useful innovation presents an interesting paradox. This paradox shows that a new technology's usefulness does not always lead to widespread use. This situation offers a chance to study how people's perception of risk affects their decision to use cryptocurrency.

Conventional wisdom and current literature often position cryptocurrency as a high-risk asset that increases portfolio uncertainty. Previous studies have predominantly focused on these negative aspects of risk perception, showing that higher perceived risks and uncertainties can deter cryptocurrency adoption (Ramprakash *et al.*, 2023). However, this perspective presents an oversimplified view of a complex phenomenon. Recent empirical evidence reveals inconsistencies in this risk-adoption relationship, with some studies finding no significant impact of perceived risk on adoption decisions (Sridharan *et al.*, 2023). Emerging research suggests that some investors view cryptocurrency as a portfolio diversification tool (Haq *et al.*, 2021). These divergent findings hint at a more complex relationship between risk perception and cryptocurrency adoption. This technology could serve both as a source of risk and as a potential risk management instrument.

The risk perception framework suggests that individuals' responses to uncertain situations are shaped not only by their assessment of potential threats but also by their perceived ability to manage these uncertainties (Chauhan *et al.*, 2019). This duality of threat evaluation and risk management may explain why cryptocurrency is not merely a risk source but a potential risk management tool in financial portfolios (Almeida & Gonçalves, 2022). Building on this theoretical foundation, this study proposes the following research question: *How do individual risk perceptions and risk management capabilities influence cryptocurrency adoption decisions?* This investigation offers several implications. Theoretically, this question extends risk perception theory by examining how individuals' risk assessment mechanisms operate in the context of emerging financial technologies. This extension potentially reshapes technology adoption frameworks in which innovations serve dual roles as both risk sources and risk management tools. From a practical perspective, understanding this nuanced relationship between risk perception and adoption can guide financial institutions and policymakers in developing strategies for cryptocurrency integration.

To examine the question, this study collected data from Thailand. The country is an ideal setting for research question examination due to several distinct characteristics. Thailand is an emerging market and has demonstrated unique patterns of financial innovation adoption. The country established clear cryptocurrency regulations through the Digital Asset Business Decree B.E. 2561 (2018) and recently updated B.E. 2568 (2025). This regulatory framework balances innovation support with investor protection. Thailand's Ministry of Finance also has waived capital gains tax on cryptocurrency transactions between

2025 and 2030. Furthermore, Thailand as comprehensive financial infrastructure for large-scale instruments. This is evidenced by detailed investigations into stablecoin usage (Wattanasin *et al.*, 2024) and the government-sponsored PromptPay ecosystem. Thai population actively engage in digital assets trading and ownership (Nakavachara *et al.*, 2024). The country is also transitioning to become a leading cashless economy in Southeast Asia (Banchongduang, 2024). Digital payment readiness provides a foundation for cryptocurrency adoption. Lastly, Thailand's industrial and economic environment offers a rich context for understanding how emerging markets adapt cryptocurrency technologies while managing associated risks.

The remainder of this paper is organized as follows. The literature review section examines existing innovation adoption frameworks, risk perception in cryptocurrency adoption, and how prospect theory applies to cryptocurrency adoption in emerging markets. Next, the paper builds hypotheses related to generation cohorts, personal economic conditions, digital financial expertise, and control variables. The methodology section describes data collection methods from Thailand between 2020 and 2024. The Results section presents statistical findings, followed by a discussion of both theoretical and practical implications. Finally, the paper addresses limitations of the study and suggests directions for future research.

LITERATURE REVIEW

Innovation Adoption Frameworks

The theoretical understanding of technology adoption has evolved significantly since the introduction of the Technology Acceptance Model (TAM) by Davis (1989). Traditional frameworks such as TAM and its successor Unified Theory of Acceptance and Use of Technology (UTAUT) have primarily focused on utilitarian factors (e.g., perceived usefulness and ease of use) as determinants of adoption intentions. These frameworks have demonstrated robustness across various contexts, from organizational information systems to consumer technologies (Venkatesh *et al.*, 2016). However, they exhibit limitations when applied to complex financial innovations in which uncertainty overshadows utility.

The emergence of sophisticated financial technologies takes the form of Janus-Faced technology. They promise advantages and present significant challenges. Cryptocurrencies, in particular, fit well with this sophistication. Users must navigate various uncertainties. However, these currencies promise both financial democratization and business opportunities. The sophistication of cryptocurrencies has exposed gaps in traditional adoption models. Traditional frameworks oversimplify risk and overestimate value perception (Hamidu *et al.*, 2023). The inadequacy of conventional frameworks in explaining cryptocurrency adoption patterns has led researchers to call for other frameworks that explicitly incorporate risk dimensions.

Recent theoretical developments suggest a shift toward risk-centric adoption frameworks for Janus-Faced innovations. This new theoretical direction acknowledges that users' adoption decisions are shaped by their assessment of how an innovation might simultaneously introduce risks while potentially helping to manage existing ones. This perspective is particularly relevant for cryptocurrency because the innovation can serve as both a source of risk and a tool for portfolio diversification.

Risk Perception in Cryptocurrency Adoption

The risk perception framework, pioneered by Slovic (1987), provides a fundamental framework for understanding how individuals evaluate and respond to uncertainties. The framework provides a structural understanding that risk perception is not merely a logical calculation but a multidimensional construct comprising cognitive and emotional components. In the context of technology adoption, risk perception encompasses both the analytical assessment of potential threats and the affective responses that these threats generate. This dual-process perspective is particularly relevant for understanding adoption decisions for complex financial technologies, such as cryptocurrencies.

Cryptocurrencies present a unique set of analytical challenges when assessing potential threats. The inherent volatility and regulatory uncertainties associated with cryptocurrencies contribute to their perception as high-risk assets (Moon *et al.*, 2025). This analytical assessment of risk is exacerbated by the decentralized nature of cryptocurrencies. This nature can lead to concerns about security, fraud, and market manipulation (Alrehaili *et al.*, 2024). A rational analysis of these complex threats shapes individuals' choices. Therefore, the adoption of cryptocurrency requires careful evaluation. Individuals must assess how these risks could affect their financial well-being. Their adoption decisions depend heavily on the cognitive aspect of risk perception.

Interestingly, affective responses to cryptocurrency risks can motivate adoption rather than deterrence. Individuals may view cryptocurrency as a hedging instrument against traditional financial system risks. This perspective aligns with the risk diversification principle of portfolio management. This principle suggests that adding an apparently risky asset might reduce overall portfolio risk through a negative correlation with other assets (Cornil & Bart, 2017). The emotional comfort derived from having alternative stores of value outweighs the analytical assessment of cryptocurrency-specific risks. This comfort is particularly relevant in a financial uncertainty environment (Ahn & Kim, 2021).

Risk perception frameworks explain how individuals assess cryptocurrency-related uncertainties, but they provide limited insight into how these assessments influence actual adoption behavior. The gap between risk assessment and behavioral outcomes requires understanding of the psychological mechanisms that govern decision-making under uncertainty.

Prospect Theory and Cryptocurrency Adoption in Emerging Markets

Prospect Theory (Kahneman & Tversky, 1979) addresses limitation of the risk perception framework by explaining how individuals process risk perceptions and translate them into adoption choices. Specifically, the theory's core principles of loss aversion and probability weighting provide crucial insights into cryptocurrency adoption decisions. Prospect Theory is a cornerstone of the behavioral finance perspective and has been applied in investment studies. The traditional expected utility theory assumes that risk preferences are stable. However, Prospect Theory demonstrates that people's risk preferences change based on context and reference points.

Prospect Theory has proven valuable in explaining investment behaviors. Studies show that investors tend to be risk-averse when facing potential gains but become risk-seeking when confronting potential losses (Olsen, 1997). This asymmetric risk preference helps explain why investors often hold losing investments too long while selling winning investments too early. This behavioral pattern persisted among cryptocurrency traders. Investors commonly demonstrate loss aversion by holding declining cryptocurrency positions hoping to break even (Ballis & Verousis, 2022). Conversely, they might quickly sell appreciating positions to secure gains. This could mean missing further upside. These behaviors reflect the theory's core principle that losses psychologically outweigh equivalent gains.

Building on the investment behavior pattern, Prospect Theory offers valuable insights into cryptocurrency adoption decisions. The adoption does not follow traditional economic values but rather psychological values (Anaza *et al.*, 2024). The theory's emphasis on behavioral reference points and asymmetric risk preferences can be naturally extended to cryptocurrency adoption. The reference point shapes individual expectations regarding cryptocurrency adoption. These expectations include both potential benefits and risks. An individual uses expectations to evaluate his/her cryptocurrency adoption behavior (Anser *et al.*, 2020). The asymmetric nature of the model suggests that potential losses weigh more than equivalent gains. Asymmetric risk preferences often work hand in hand with reference points. This combination can cause adoption rates to differ from expected reference behavior (Kallinterakis & Wang, 2019).

Central to this psychological mechanism is the role of individuals' perceived ability to control and mitigate uncertainties, risk management capabilities. Financial literature demonstrates that these capabilities are multidimensional constructs encompassing financial literacy, risk assessment skills, and confidence in financial management (Lusardi & Mitchell, 2014). Individuals with higher financial literacy show greater adoption of diversified investment strategies and more sophisticated risk evaluation processes (Dhuppad, 2025). However, many investors still rely on traditional and conservative approaches due to limited risk management knowledge (Wright, 2023). These capabilities directly influence how individuals set their reference points and evaluate potential outcomes. Those with stronger risk management capabilities may establish more optimistic reference points, viewing cryptocurrency adoption as a manageable opportunity rather than an uncontrollable threat.

Applying Prospect Theory to cryptocurrency adoption helps understand behavior in emerging markets like Thailand. Emerging markets have unique cultural and economic factors (Do Nascimento Junior *et al.*, 2021). These factors affect how people set reference points and evaluate risks. In emerging markets, where financial systems may be less stable or trusted, cryptocurrency may be perceived differently than in developed economies. Thai investors, for instance, may view cryptocurrency as a hedge against currency fluctuations or economic uncertainties, despite its inherent volatility. This perspective aligns with the theory's prediction that risk preferences shift based on contextual factors. Emerging markets often have a collective investment culture and varying levels of financial literacy. These factors influence how people make cryptocurrency adoption decisions using Prospect Theory.

HYPOTHESIS BUILDING

Prospect Theory highlights the key role of risk perception and risk management capabilities in cryptocurrency adoption decisions. Individuals evaluate cryptocurrency adoption based on their reference point of financial risk tolerance perspective. Generation differences affect how people perceive the risks and benefits of cryptocurrency investments, with Generation Z's digital nativity potentially lowering their perceived risks. The prevailing economic condition serves as a contextual reference point that shapes how individuals assess potential gains and losses from cryptocurrency investments. Experience with digital financial services provides individuals with practical risk management skills. Mobile banking and payment system usage demonstrates a person's ability to handle digital financial risks. These technological competencies may reduce barriers to cryptocurrency adoption by enhancing risk management capabilities. Additionally, individuals using established risk management tools like insurance products may better evaluate and manage cryptocurrency-related uncertainties.

Generation Cohort

Generation Z exhibits distinct characteristics in cryptocurrency adoption that align with Prospect Theory's risk perception framework. The younger generation views cryptocurrencies as both investment tools and speculative ventures akin to gambling (Sonkurt & Altınöz, 2021). Generation Z's familiarity with digital technology shapes their risk management capabilities and makes them more comfortable with cryptocurrency platforms. The risk assessment process is heavily influenced by social factors

and peer networks. This generation's approach to cryptocurrency matches Prospect Theory's principal of asymmetric risk preference, particularly in its attraction to high-risk and high-reward scenarios (Lekshmi *et al.*, 2023). This study uses Generation Z's risk-taking behavior as a baseline to compare other generations' cryptocurrency adoption patterns.

Baby Boomers

Baby Boomers typically exhibit different risk perceptions than Generation Z when evaluating cryptocurrency investments. Under Prospect Theory, Baby Boomers weigh potential losses more heavily than gains (Sharma *et al.*, 2022). This generation's risk perception is shaped by their longer experience with conventional financial systems. Their reference point for financial decisions is often based on traditional investment methods such as stocks and bonds. This anchored point leads the generation to view cryptocurrency volatility primarily as a threat rather than an opportunity.

Baby Boomers also demonstrate distinct risk management capabilities that influence their cryptocurrency adoption decisions. They have higher expectations and demands regarding services. Furthermore, they have less exposure to digital platforms than Generation Z. There are concerns about the potential for investment fraud targeting this demographic (Kieffer & Mottola, 2017). These limitations may reduce the Generation's confidence in managing risks associated with cryptocurrency. Therefore, Baby Boomers arguably demonstrate a lower cryptocurrency adoption potential than Generation Z. H1 is proposed.

H1: Baby Boomers are less likely to adopt cryptocurrency than Generation Z.

Generation X

Generation X exhibits distinct cryptocurrency adoption patterns shaped by its unique position in the traditional and digital financial worlds. Their reference point under Prospect Theory combines conventional financial products and new digital solutions. While Generation X shares some risk concerns with Baby Boomers (Hong *et al.*, 2024), their experience bridging the analog and digital worlds creates a more balanced risk assessment approach. They show more caution than Generation Z but less skepticism than Baby Boomers toward cryptocurrency's decentralized nature (Wang, 2024).

Generation X's risk management capabilities reflect their transitional position in the digital evolution. Their higher digital literacy than Baby Boomers enables better adaptation to cryptocurrency platforms. However, their financial literacy and stage priorities, including family responsibilities and retirement planning, make them more sensitive to financial risks (Catacutan & Moleño, 2024). Although they understand digital technologies better than Baby Boomers, Generation X still prefers established financial systems for significant investments. Their concerns about cryptocurrency's security and regulatory framework along with their more conservative risk management suggest a lower adoption potential than Generation Z. Therefore, this study proposes the following hypothesis.

H2: Generation X is less likely to adopt cryptocurrency than Generation Z.

Millennials

Millennials occupy a unique position in cryptocurrency adoption because of their distinctive relationship with digital technology and financial markets. This generation witnessed both the dot-com bubble burst and the 2008 financial crisis during their formative years. Under Prospect Theory, these experiences create a distinct reference point. They are more skeptical of traditional financial institutions but also more cautious about speculative investments (Lambert *et al.*, 2023). Millennials' risk perception of digital assets is unlike Generation Z's optimistic view. The multiple exposures to economic downturns have created a more understanding of financial risk. These personal experiences balance technological familiarity with heightened awareness of market volatility (Mazambani & Mutambara, 2020). Therefore, Millennials exhibit a more measured approach to cryptocurrency adoption decisions.

Millennials demonstrate distinct risk management skills in cryptocurrency investments. Their digital literacy is equal to that of Generation Z. They are comfortable using cryptocurrency trading platforms and digital wallets. However, their risk management approaches differ significantly. Millennials have witnessed multiple cryptocurrency market cycles. Many experienced the Bitcoin crash of 2018 and other cryptocurrency asset volatility events. These experiences have shaped their cryptocurrency adoption strategies. They often diversify their cryptocurrency portfolios more carefully than Generation Z (Smutny *et al.*, 2021). They also show greater interest in the long-term practical value of cryptocurrency. By combining Millennials' risk perception and management capability, this study argues that Millennials remain more hesitant than Generation Z in cryptocurrency adoption. Therefore:

H3: Millennials are less likely to adopt cryptocurrency than Generation Z.

Personal Economic Condition

Personal economic conditions play a crucial role in financial decision-making, including cryptocurrency adoption choices. These conditions shape how individuals evaluate opportunities and risks in their investment decisions (Han & Park, 2019). Prospect

Theory explains that individuals assess their choices relative to a reference point. The reference point helps people evaluate potential gains and losses in their decisions. Neutral economic conditions could serve as a reference point in cryptocurrency adoption decisions. This neutral state represents a baseline at which an individual's financial situation does not exhibit significant positive or negative fluctuations. Individuals tend to evaluate risks and benefits more objectively under such conditions. This makes the condition an ideal reference point for understanding individual adoption behaviors.

Individuals with positive economic conditions tend to perceive lower risks in cryptocurrency adoption. This perception stems from increased financial resources and optimism. People feel more capable of managing financial related risks. Very positive economic conditions further enhance this effect, as individuals have more disposable income and higher risk tolerance. Their risk management capabilities also improve because of better access to information and financial advice (Zhao & Zhang, 2021). These factors combine to make cryptocurrency adoption more attractive during positive personal economic periods.

Conversely, negative economic conditions alter individuals' risk perception and risk management capabilities. People become more sensitive to potential losses. Their risk perception significantly increases, making them more cautious about financial ventures. Very negative conditions amplify this effect. Individuals focus more on preserving their existing wealth (Ünal-Karagüven, 2009). Their risk management capabilities are also reduced because of limited financial resources and reduced access to helpful tools. These behavioral patterns imply that economic conditions negatively influence cryptocurrency adoption.

H4: Personal economic conditions influence cryptocurrency adoption.

H4a: Positive personal economic conditions positively influence cryptocurrency adoption.

H4b: Negative personal economic conditions negatively influence cryptocurrency adoption.

Digital Financial Expertise

Digital financial expertise plays a crucial role in cryptocurrency adoption decisions. Individuals familiar with digital financial services may perceive lower risks in cryptocurrency adoption. Certain digital services' risks have already been internalized and normalized (Miko *et al.*, 2023). Prior experience with digital financial tools can enhance an individual's risk management skills. These individuals have better risk assessment (Zamoras *et al.*, 2024). This role of individual familiarity with digital finance tools agrees with Prospect Theory, which explains how people make gain-and-loss decisions based on their risk perceptions and management capabilities.

Mobile payment and banking services are common digital financial tools in Thailand (Navavongsathian *et al.*, 2020). These services help users develop a basic understanding of digital transactions. However, they offer different experiences in digital finance. Mobile banking focuses on traditional banking activities like savings and fund transfers, between bank accounts. Mobile payments mainly involve daily spending and merchant transactions. Mobile banking users develop the skills to manage large amounts of money and long-term financial planning. Mobile payment users gain experience in frequent, smaller transactions and peer-to-peer transfers. Both services help users learn about digital security and financial technology in different ways. This study argues that knowledge and experience gained through mobile payment and banking may reduce users' perceived risks when considering cryptocurrency adoption.

Mobile Banking Usage

Mobile banking users develop experience managing digital financial risks. These users regularly interact with digital authentication processes and transaction verifications. Through mobile banking usage, they learn to trust and handle digital money safely (V. Gupta & Shukla, 2024). Mobile banking users are more familiar with digital money concepts than non-users. They understand that money can exist in digital form and can be transferred electronically. This understanding helps lower psychological barriers to new financial technologies.

Mobile banking usage develops risk management capabilities that are transferable to new financial technologies. Users learn how to monitor their digital transactions and detect unusual activities. They become comfortable managing digital wallets and understand basic security practices. Mobile banking users learn to assess and respond to digital financial risks through their regular banking activities. Their experience with digital financial tools enhances their confidence in handling new financial technologies (Mazambani & Mutambara, 2020). Therefore, this study hypothesizes that individuals who use mobile banking systems are more likely to adopt cryptocurrencies.

H5: Individuals who use mobile banking systems are more likely to adopt cryptocurrencies.

Mobile Payment Usage

Mobile payment users have developed basic skills for managing digital financial risks (Huang *et al.*, 2020). These users engage in small but frequent digital transactions. Their confidence in electronic payment systems has increased through frequent usage. According to Prospect Theory, people evaluate risks based on their reference points and experiences. The daily experience of mobile payment users with digital transactions serves as a positive reference point. This experience reduced their perception of

potential losses in cryptocurrency adoption. Familiarity with digital payment interfaces also lowers psychological barriers to new financial technologies.

Mobile payment experience enhances users' risk management capabilities in the digital financial domain. These users have learned to handle basic security measures such as passwords and verification processes. They understand how to monitor and detect unusual activities. These experiences ease their security concerns as they become aware of how to protect their digital assets (Seldal & Nyhus, 2022). Prospect Theory suggests that people are more willing to take risks in areas where they feel competent. Mobile payment users have gained this competence by regularly using digital financial tools. Their established risk management routines in mobile payments can be transferred to cryptocurrency management. This skill transfer makes cryptocurrency adoption less risky and more manageable. Therefore, this study proposes that mobile payment users are more likely to adopt cryptocurrencies due to their lower risk perception and enhanced risk management capabilities.

H6: Individuals who use mobile payment systems are more likely to adopt cryptocurrencies.

Control

Control variables were essential in this study. They helped enhance this study model's validity. These variables isolate the effects of the main predictors of cryptocurrency adoption. They account for other factors that may influence the dependent variable.

This study includes three key control variables: gender, insurance ownership, and cohort. Gender affects financial decision-making and technology adoption (Rani & Kumar, 2024). Males and females have different risk preferences in financial matters. Studies have revealed varying levels of cryptocurrency adoption by males and females (Ter Ji-Xi *et al.*, 2021). Under Prospect Theory, females typically exhibit higher loss aversion than males. They tend to weigh potential losses more heavily in financial decisions. Hence, including gender as a control variable helps isolate the true effects of the main predictors without gender-based bias.

Insurance ownership demonstrates how people manage risks. People with insurance products understand (N. Gupta *et al.*, 2022) risk mitigation. These basic risk behaviors may affect their perception of new financial technologies. Insurance ownership can indicate different psychological states and risk assessment abilities (Ter Ji-Xi *et al.*, 2021). These aspects align with Prospect Theory's emphasis on how individuals frame and evaluate potential losses. Insurance owners demonstrate their reference point for loss prevention and risk mitigation. Hence, owning insurance could influence cryptocurrency adoption decisions.

The cohort variable accounts for year-specific effects during the five-year data collection period. Different years may have unique market economic conditions. These conditions can affect cryptocurrency adoption decisions. For example, market trends, regulations, and public sentiment may vary over years. The cohort variable helps control these temporal effects. These control variables allow this study to better isolate the true relationship among interested variables.

DATA COLLECTION

This study collected secondary data from Statista's Global Consumer Insights. This database provides a robust and reliable source of Thailand's consumer data. Consumer insights are collected, verified, and managed by Statista. Survey questionnaire methodology is the primary data collection method (Statista, 2024). The questionnaire was designed in accordance with BVM/ADM Germany guidelines. According to Statista, the Consumer Insights questionnaire was double translated to local languages to maximize validity. Participants are carefully selected to represent the population in each country.

The data were from 2020 to 2024. The following data collection method was applied for each year. First, the dependent variable Cryptocurrency owner is selected to set target groups. Second, participants in each group were selected by the attributes of dependent and control variables: Age (generations), Personal economic situation, Mobile banking user, Mobile payment user, Gender, and Insurance owner. Finally, the database provided the numbers of people classified according to the attributes. For example, in 2020, there were 14 Millennials male who owned cryptocurrency, had a neutral economic situation, used mobile banking, used mobile payment user, and own insurance from 880 participants in 2020. In all, the database reported 4,601 participants across 5 years.

DESCRIPTIVE STATISTICS

This section presents the descriptive statistics of the study participants. The sample includes 4,601 participants over five consecutive years (2020-2024), with approximately 900 participants per year. Understanding sample characteristics is important for two key reasons. First, it helps verify whether the sample adequately represents different generations and socioeconomic groups in Thailand. Second, it provides a context for the subsequent analysis.

Sample Distribution by Year

The table below shows cohorts and number of participants. The collection maintained strong consistency across the five-year period. The yearly samples were well-balanced, varying by only 73 participants between the smallest and largest groups. 2023 provided the highest response rate with 953 participants. The first year of this study (i.e., 2020) had the lowest count of 880

participants. This stable sample size pattern suggests that the original data collection process remained effective throughout the study period, even during the global COVID-19 pandemic and subsequent recovery years. The even distribution of participants across the years also minimizes potential time-related biases in hypothesis testing.

Table 1: Cohorts and number of participants.

Cohort	Participants (n)
2020	880
2021	919
2022	914
2023	953
2024	935

Source: This study.

Sample Characteristics

The statistics in the table below reveal important patterns related to the research hypotheses. Of the 4,601 participants, 38.58% adopted cryptocurrency. The generational distribution shows that Millennials form the largest group (39.10%), followed by Gen X (32.17%), Gen Z (22.43%), and Baby Boomers (6.30%). This distribution is suitable for testing the first three hypotheses for two reasons. First, each generation had a sufficient sample size for statistical analysis. Second, the presence of Gen Z (the reference group) alongside other generations enables direct comparisons of adoption behaviors across age groups.

The sample shows an overall gender ratio of 51% male to 49% female. This ratio requires careful interpretation because it does not match the published ratio in official statistics handbook (*Statistical Yearbook Thailand 2024*, 2024). Deeper examinations revealed that ratios of all years closely matched Thailand's actual gender ratio, except for 2023. The data revealed an unusual split of 70% male to 30% female participants. This sampling bias in 2023 shifted the overall ratio. However, this study used the longitudinal cohort variable to control this temporary deviation. The cohort variable allows this study to account for year-specific effects. As a result, the statistical results are robust despite the 2023 gender bias. For economic conditions, 36.82% of participants reported positive or very positive conditions, while 32.36% reported negative or very negative conditions. The high adoption rates of mobile banking (74.20%) and mobile payment systems (65.75%) provide good data for testing related hypotheses.

The insurance ownership rate in the sample is 93%, compared to the national statistics that 99% of the Thai population have some kind of insurance (*Statistical Yearbook Thailand 2024*, 2024). Although there is a difference, both figures show very high insurance coverage. This highlights Thai people's strong risk management behavior.

Table 2: Sample Characteristics.

Variable	Category	Frequency (n)	Percentage (%)
Cryptocurrency adopters	Yes	1775	38.58
	No	2826	61.42
Generation	Baby Boomers	290	6.30
	Gen X	1480	32.17
	Millennials	1799	39.10
	Gen Z	1032	22.43
Economic condition	Very positive	408	8.87
	Positive	1286	27.95
	Neutral	1418	30.82
	Negative	1083	23.54
	Very Negative	406	8.82
Mobile banking users	Yes	3414	74.20
	No	1187	25.80
Mobile payment users	Yes	3025	65.75
	No	1576	34.25
Gender	Male	2345	50.97
	Female	2256	49.03
Insurance owners	Yes	4279	93.00
	No	322	7.00

Source: This study.

RESULT

This study applied logistic regression analysis to model cryptocurrency adoption behavior. The dependent variable is a binary value of adoption (1) or non-adoption (0). The analysis tested six hypotheses examining generational differences (H1-H3), economic condition effects (H4a-H4b), and digital financial expertise influence (H5-H6) on cryptocurrency adoption. This study controlled for gender and insurance ownership in the analysis. Table 1 presents the logistic regression coefficients along with their corresponding p-values. Most hypothesized relationships were supported by the statistical results.

Table 3: Logistic regression on cryptocurrency adoption behavior.

Variable	Coefficient	P-value
Cohort	0.223	0.000
Baby boomer	-0.850	0.000
Gen X	-0.431	0.000
Millennial	-0.083	0.000
Very positive economic condition	0.543	0.000
Positive economic condition	0.413	0.000
Negative economic condition	0.031	0.186
Very negative economic condition	-0.035	0.296
Mobile banking user	0.827	0.000
Mobile payment user	0.516	0.000
Male	0.334	0.000
Insurance owner	0.662	0.000

Source: This study.

Generational hypothesis testing confirmed H1, H2, and H3, with all coefficients showing statistical significance ($p < 0.001$). Baby boomers have the strongest negative relationship with cryptocurrency adoption (coefficient = -0.850), followed by Generation X (coefficient = -0.431), and then Millennials (coefficient = -0.083). This creates a clear generational gradient in which the likelihood of cryptocurrency adoption increases as the analysis moves from older to younger generations. Generation Z, which serves as the reference group, has the highest adoption propensity among all generations. This pattern aligns with the technological adoption trends observed in other digital innovations.

For economic conditions (H4), the results partially support the hypotheses. H4a is strongly supported as both very positive (coefficient = 0.543, $p < 0.001$) and positive economic conditions (coefficient = 0.413, $p < 0.001$) significantly increase the likelihood of cryptocurrency adoption. However, H4b receives limited support. Although very negative economic conditions show a small negative effect (coefficient = -0.035) as predicted, this relationship is not statistically significant ($p = 0.296$). Interestingly, negative economic conditions show a slight positive effect (coefficient = 0.031), but this is also not significant ($p = 0.186$). These results indicate that positive economic situations clearly encourage cryptocurrency adoption, whereas negative economic situations do not necessarily discourage it.

The digital financial expertise hypotheses (H5 and H6) received strong support. Mobile banking users are substantially more likely to adopt cryptocurrencies (coefficient = 0.827, $p < 0.001$), confirming H5. Similarly, mobile payment system users show an increased likelihood of cryptocurrency adoption (coefficient = 0.516, $p < 0.001$), supporting H6. The effect of mobile banking usage is stronger than that of mobile payment usage. These results highlight the importance of digital financial expertise when making cryptocurrency adoption decisions.

The predictive model demonstrated moderate performance with an accuracy of 59.61%, meaning it correctly identified cryptocurrency adopters approximately 60% of the time (Table 2). The precision value of 47.76% indicates that when the model predicts adoption, it is correct in less than half of these cases. However, the recall rate is higher at 63.82%, suggesting that the model is better at identifying actual adopters among the population. The F1 score of 54.63% provides a balanced measure of precision and recall. The ROC AUC score of 64.07% indicates reasonable discriminative ability, but there is still substantial room for improvement. These metrics reveal that the model possesses useful predictive power but is not yet fully reliable for cryptocurrency adoption prediction.

Table 4: Performance of logistic regression model.

Indicator	Value
Accuracy	0.596
Precision	0.478
Recall	0.638
F1 Score	0.546
ROC AUC Score	0.641

Source: This study.

DISCUSSION

Findings support the risk perception and risk management capabilities framework in cryptocurrency adoption behavior across Thailand during the COVID-19 recovery period. The study answers the research question of how individual risk perceptions and risk management capabilities influence cryptocurrency adoption decisions. The generational differences align with Prospect Theory, showing significant decreasing adoption rates from Generation Z to Baby Boomers (coefficients: Baby Boomers -0.850, Gen X -0.431, Millennials -0.083; all $p < 0.000$). This pattern reflects how different generations assess cryptocurrency risks based on distinct reference points. Generation Z, who are digital natives, perceive lower risks in cryptocurrency adoption, supporting Murugappan *et al.*'s (2023) observation that demographics significantly influence cryptocurrency usage. The positive effect of favorable economic conditions (Very positive: 0.543, Positive: 0.413; both $p < 0.000$) on adoption rates further confirms Prospect Theory's explanation of risk assessment. Individuals experiencing positive economic circumstances display greater willingness to adopt cryptocurrency as their reference point as they shift toward potential gains. This finding connects with Sergio and Wedemeier's (2025) research showing that economic stability is a significant factor in adoption patterns. The absence of a significant negative effect from unfavorable economic conditions hints that economic hardship alone does not necessarily deter adoption in the Thai context.

The results demonstrate that risk management capabilities significantly influence cryptocurrency adoption decisions. Mobile banking users (coefficient 0.827, $p < 0.000$) and mobile payment users (coefficient 0.516, $p < 0.000$) show substantially higher adoption rates, supporting the theoretical argument that digital financial expertise reduces perceived risks. This aligns with Alrehaili *et al.*'s (2024) findings that perceived ease of use and usefulness drive cryptocurrency adoption. The significant positive effect of insurance ownership (coefficient 0.662, $p < 0.000$) further supports this study's risk management framework, suggesting that individuals with existing risk mitigation tools feel more confident managing cryptocurrency uncertainties. The findings reveal that cryptocurrency adoption is not simply hindered by risk perception. In fact, it is facilitated when individuals possess adequate risk management capabilities. The year-over-year increase in adoption (coefficient 0.223, $p < 0.000$) indicates growing comfort with cryptocurrency as the market matures in Thailand. These findings connect with Kajol *et al.*'s (2025) research identifying optimism as a key adoption factor and Doblas *et al.*'s (2024) conclusion that self-efficacy significantly influences adoption intentions. Together, the results confirm that cryptocurrency adoption in Thailand during 2020-2024 was significantly shaped by individuals' risk perception framework and their ability to manage those perceived risks.

Theoretical Implications

This study extends the theoretical understanding of risky financial innovation adoption by challenging the conventional view of cryptocurrency as a high-risk asset. Traditional technology adoption models such as TAM and UTAUT, focus on utility factors but overlook how individuals may adopt seemingly risky innovations as part of their risk management strategy. The findings reveal the Janus-Faced nature of cryptocurrency, functioning as both a source of risk and a risk management tool. Insurance owners typically demonstrate risk awareness and are found to have higher cryptocurrency adoption rates. These findings suggest that they view cryptocurrency as portfolio diversification rather than just uncertainty. Ballis and Verousis (2022) highlighted how behavioral factors influence cryptocurrency investment decisions beyond rational calculations. The significant adoption rates of mobile banking and payment users further support this dual nature perspective. These users appear to leverage their digital financial expertise to manage cryptocurrency risks.

The results show how cognitive and emotional aspects of risk perception shape cryptocurrency adoption. Mobile banking and payment users have lower perceived risks due to technical familiarity. Insurance owners likely feel emotional comfort from using cryptocurrency as an alternative store of value. This supports the literature review's dual-process perspective of risk perception. Anaza *et al.* (2024) found similar patterns in which emotional factors drove cryptocurrency investment despite market volatility. The difference in risk perception explains risk perception difference explains the generational adoption gaps in the findings. Generation Z's digital nativity reduces their perceived cryptocurrency risks compared to older generations. This extends risk perception theory beyond simple risk acceptance and avoidance. The findings suggest that people assess cryptocurrency threats analytically when making adoption decisions. They also respond emotionally to these threats during the decision-making process.

The findings provide empirical support for applying Prospect Theory to cryptocurrency adoption, specifically in emerging markets like Thailand. The significant adoption among individuals with positive economic conditions aligns with Prospect Theory's premise that reference points influence risk behaviors, similar to Do Nascimento Junior *et al.*'s (2021) findings that Prospect Theory has predictive power for investment decisions in emerging countries. People in favorable economic positions appear more willing to take calculated risks using cryptocurrency, viewing it as potential gains from a secure reference point. This connects with Ali and Asri's (2019) observation that Prospect Theory can predict decision-making when managing investment risks in emerging markets. The non-significant effect of negative economic conditions suggests that these individuals have different reference points, possibly viewing cryptocurrency as a recovery tool when experiencing financial pressure.

Practical Implications

The findings offer practical implications for financial institutions and cryptocurrency service providers in Thailand. Financial service providers should develop targeted marketing and educational strategies based on generational differences. Gen Z shows the highest adoption rates and should be a primary target, which is consistent with Moon *et al.*'s (2025) finding that generational differences moderate cryptocurrency adoption intentions. However, older generations require different educational approaches to address their specific risk concerns. Kajol *et al.* (2025) identified optimism as one of the most influential factors in cryptocurrency adoption. Their findings suggest that educational programs should foster positive yet realistic attitudes toward cryptocurrency's role in financial planning. Additionally, these programs should emphasize risk management principles. It is also important to tailor educational efforts to address the different needs of various generations.

Banks and payment providers should leverage strong adoption correlations with digital financial expertise. One possibility is to create integrated services connecting traditional banking with cryptocurrency options. This integration will build on existing mobile banking and payment capabilities to facilitate adoption across generations. This recommendation is supported by Magazzino *et al.*'s (2025), who found that cryptocurrency adoption is more prevalent in environments with robust financial markets. The positive association between insurance ownership and cryptocurrency adoption suggests that consumers view cryptocurrency as part of broader financial planning rather than isolated risk-taking. Financial institutions should therefore develop cryptocurrency products that explicitly complement traditional risk management tools. These products should be positioned as portfolio diversification options rather than as speculative investments.

Regulators and educational institutions should consider the positive association between favorable economic conditions and cryptocurrency adoption when timing interventions. During economic upturns, more people may be receptive to cryptocurrency education, allowing consumers to make informed decisions when they have the financial capacity to act. This aligns with Guo *et al.*'s (2025) research on how economic conditions influence cryptocurrency adoption patterns. Sergio and Wedemeier (2025) found that adoption is significantly influenced by economic stability and infrastructure availability, which should inform how Thai regulators approach consumer protection while allowing innovation to continue in Thailand's evolving digital financial ecosystem.

LIMITATIONS AND FUTURE DIRECTIONS

This study has several limitations that should be acknowledged. First, the use of secondary data from 2020 to 2024 limits the depth of variables' analysis. The most critical concern is construct validity. The use of proxy measures inevitably introduces measurement errors in theoretical constructs. This study used a high-quality data source and carefully selected proxy variables that align well with the theoretical definitions of constructs. However, the gap between theoretical constructs and operational measures remains a validity threat. Furthermore, statistical analysis was conducted carefully to minimize this limitation. Second, the repeated cross-sectional design prevents tracking individual behavioral changes over time. While this approach effectively captures population-level trends and generational differences, it fundamentally cannot establish causal relationships about how individual adoption decisions evolve. The year fixed effects control for temporal variations but cannot fully substitute for true longitudinal tracking of the same individuals. Third, this study focuses only on Thailand, which has unique cultural and regulatory characteristics that may not be generalizable to other economies. The specific timeframe coinciding with the COVID-19 recovery creates additional contextual constraints that might not persist in more stable economic periods. Additionally, while this study controlled for gender and insurance ownership, other important factors such as education level, income, and specific risk tolerance measures were not available in the dataset. These omitted variables represent missing theoretical mechanisms that might provide a more comprehensive understanding of adoption patterns.

Future research should systematically address these limitations through several approaches. To resolve the construct validity issue, the use of custom-designed measures could test these relationships more precisely. To address the causal inference limitation, panel design could reveal how adoption decisions evolve as individuals gain experience with digital financial technologies. Such design tracks the same individuals over time would provide stronger evidence for causal relationships and behavioral change patterns. To improve generalizability, researchers should expand the geographical scope to include comparative analyses across different economies with varying cryptocurrency regulations. To capture missing theoretical mechanisms, researchers should also explore the qualitative aspects of cryptocurrency adoption by examining the specific use cases and motivations behind such adoption. This could reveal whether users primarily view cryptocurrencies as speculative investments, inflation hedges, or practical payment tools. Future studies might also benefit from applying a mixed-methods approach that combines quantitative adoption data with qualitative insights about risk perception and management strategies. Finally, building on these methodological improvements, investigating how cryptocurrency adoption interacts with broader financial literacy and digital competency initiatives could provide valuable insights for policymakers and educators in Thailand and similar emerging markets.

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