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Factors affecting cryptocurrency adoption: Extending the UTAUT2 model with financial literacy and trust

Hans Christian Salim[1*], Ricky Angriawan[2], Rindang Widuri[3]
[1,2]Accounting Department, School of Accounting, Bina Nusantara University, Jakarta 11480. Indonesia; hans.salim@binus.ac.id (H.C.S.) ricky.angriawan001@binus.ac.id (R.A.)
[3]Accounting Department, School of Accounting – Master of Accounting, Bina Nusantara University, Jakarta 11480. Indonesia; rindangw@binus.edu (R.W.)

Abstract: The adoption of cryptocurrency has accelerated due to technological advancements and growing public interest in digital assets. Cryptocurrencies like Bitcoin and Ethereum use blockchain technology to enable decentralized and transparent transactions. While often viewed as investment tools, this study focuses on users' intentions to adopt cryptocurrency for peer-to-peer transactions, decentralized applications, and digital financial services. The research extends the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) by incorporating trust and financial literacy. Key constructs include performance expectancy, effort expectancy, social influence, facilitating conditions, trust, price value, and financial literacy. Using a quantitative approach, survey data from Indonesia were analyzed with Structural Equation Modeling–Partial Least Squares (SEM-PLS). Results show that the extended UTAUT2 model explains 63.5% of the variance in behavioral intention. Performance expectancy, trust, and price value significantly influence adoption, with trust being the strongest predictor. Financial literacy was not significant, suggesting that awareness of risks may lead to non-adoption. Regulators should establish transparent policies to foster trust, while developers should emphasize usability and clear benefits. For users, the findings support that not adopting cryptocurrency despite being financially literate can be a rational and informed decision.

Keywords: *Adoption intention, Cryptocurrency, Financial literacy, Technology, Trust, UTAUT2.*

1. Introduction

Cryptocurrency is a digital or virtual currency that utilizes cryptographic technology to secure transactions, control the creation of new units, and verify asset transfers on a decentralized network [1]. Unlike traditional fiat currencies issued by governments, cryptocurrencies operate on blockchain technology, a distributed ledger system that records all transactions across a network of computers, ensuring transparency, security, and immutability [2]. The first cryptocurrency, Bitcoin, was introduced in 2009 by an anonymous entity known as Satoshi Nakamoto as an alternative to conventional financial systems, aiming to provide a peer-to-peer method of transferring value without intermediaries from financial institutions [1].

Blockchain technology has evolved beyond traditional transactions, particularly with smart contracts and decentralized finance (DeFi), which facilitate financial activities without intermediaries [3]. When a decentralized peer-to-peer network becomes widely adopted, no single organization can gain enough control to dominate or restrict participation. This ensures that all users can benefit from network effects, thereby expanding opportunities for transactions [4]. This innovation improves efficiency and transparency in complex multi-party processes; for instance, automating supply chain transactions can reduce fraud and delays in global trade [5]. Beyond enterprise use, blockchain-based decentralized finance (DeFi) platforms such as MakerDAO, Compound, and Dharma use smart

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* Correspondence: hans.salim@binus.ac.id

contracts to facilitate decentralized lending and borrowing, reducing costs, friction, and delay in such processes [6]. Such applications illustrate how cryptocurrencies function as the backbone of a broader ecosystem of decentralized applications, from finance to supply chains, rather than merely as digital coins for investment. By reducing or eliminating the need for intermediaries, decentralized finance (DeFi) leverages smart contracts to lower transaction costs and enhance social trust, fostering the development of more efficient and sustainable financial models [7].

The cryptocurrency market has come a long way since it was founded in 2009 and giants in the market leaders like Bitcoin (BTC), have reached unprecedented all-time highs in late 2024, drawing significant attention from individuals seeking to capitalize on its potential gains. Over the years, the cryptocurrency market has grown exponentially, disrupting traditional financial assets and derivatives, and positioning cryptocurrency as a highly promising investment avenue [8]. These coins can be traded by issuing them through an Initial Coin Offering on platforms [9]. highlights that these Initial Coin Offerings (ICOs) have become an innovative crowdfunding method within the cryptocurrency ecosystem, offering an alternative to traditional financing mechanisms. ICOs integrate elements of crowdfunding and equity crowdfunding with distributed ledger technology, offering startups an alternative means of securing external funding by issuing and selling tokens to a broad investor base [10]. ICOs also offer several advantages, such as directness, liquidity, and the removal of traditional financial gatekeepers, allowing early adopters to support and contribute to a project's success. However, they also come with risks, as ICOs largely operate in an unregulated environment, exposing participants to potential fraud and poor performance. Research indicates that less than half of all ICOs survive beyond four months after issuance [11].

Cryptocurrency adoption has continued to expand globally, with over 420 million users reported as of 2023 and an estimated ownership growth rate of 4.2%. Reflecting this surge in participation, the market's total valuation has reached approximately $1.25 trillion, further establishing its role as a major financial force [12]. The growing acceptance of cryptocurrency is also evident in institutional adoption. Major financial institutions, including BlackRock, Fidelity, and Goldman Sachs, have introduced cryptocurrency investment products, further legitimizing the market. The approval of Bitcoin exchange-traded funds (ETFs) in the United States in 2024 has allowed traditional investors to gain exposure to crypto assets without the complexities of direct ownership, attracting significant institutional capital. Institutional investors provide greater market liquidity and reduce extreme volatility, stabilizing cryptocurrency prices over time. ETFs are SEC-regulated investment entities whose shares are classified as securities requiring registration. Like mutual funds, they have investment objectives managed by professionals. For managed commodity futures funds, firms often establish commodity pools, which trade commodity futures contracts. These pools and their operators are regulated by Commodity Futures Trading Commission (CFCT) [13].

This increasing integration of cryptocurrency into traditional financial markets signals a shift in perception, from speculative assets to mainstream investment opportunities, not only in the United States but also in Indonesia. The Commodity Futures Trading Regulatory Agency (BAPPEBTI) of the Indonesian Ministry of Trade has reported substantial growth in cryptocurrency transactions, reflecting the increasing adoption of digital assets in the country. The total value of cryptocurrency transactions increased by 356.16% year-on-year (YoY), reaching IDR 556.53 trillion during the January–November 2024 period [14]. This sharp increase highlights the growing interest in cryptocurrency trading among Indonesian investors. In addition, state revenue from cryptocurrency transaction taxes amounted to IDR 511.8 billion between January and November 2024, compared to IDR 220.83 billion in the full year of 2023, underscoring the sector's expanding contribution to the national economy [15]. As of January 2025, cryptocurrency exchange oversight is being transferred to OJK from BAPPEBTI as the regulatory authority overseeing futures commodity trading in Indonesia, this plays a crucial role in supervising crypto asset market traders operating within the country. Its responsibilities include ensuring compliance with existing laws and maintaining market integrity. However, despite the rapid growth of the cryptocurrency sector, current regulations remain insufficient in providing specific protection for investors against potential losses associated with cryptocurrency transactions. For instance, POJK 27 Tahun 2024 emphasizes governance, transparency, and operational standards for digital asset trading, but does not explicitly address investor compensation or protection against market-related losses. Full implementation of consumer protection provisions is also deferred until January 2025, as regulated under POJK No. 22/POJK.07/2023. Islam, et al. [16] highlight growing concerns over the misuse of cryptocurrencies for illicit activities, including fraud, illegal trading, and money laundering. Exploiting Bitcoin's pseudo-anonymity to conceal the origins of unlawfully obtained funds.

The inherent complexity and diverse perceptions of cryptocurrencies present significant barriers to widespread adoption. Prior studies employing the UTAUT2 model have explored specific factors influencing cryptocurrency adoption; for instance, Restuputri, et al. [17] examined digital asset and crypto investment applications in Indonesia, Arias-Oliva, et al. [18] analyzed the role of financial literacy in Spain, and Shahzad, et al. [19] assessed cryptocurrency adoption in China with perceived trustworthiness as a key variable. However, existing research has yet to explore the combined effect of trust, price value, and financial literacy as integrated variables within the UTAUT2 framework. This research gap is particularly critical, as trust and price value may significantly influence technology adoption among potential users, especially those without prior experience but who perceive substantial benefits in cryptocurrency usage. Given cryptocurrencies' inherent volatility, regulatory uncertainty, and technological complexity, financial literacy could also significantly shape individuals' risk perceptions and adoption decisions. To address this gap, the present study extends the UTAUT2 model by incorporating trust, price value, and financial literacy as additional variables, which are deemed suitable for capturing the unique characteristics of cryptocurrency adoption.

2. Literature Review and Hypothesis

2.1. UTAUT2 Model and Technology Adoption

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) Venkatesh, et al. [20] is an extension of the original UTAUT model [21] and has been extensively applied to examine technology adoption. UTAUT2 incorporates key determinants such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit. It also includes age, gender, and experience as moderating variables, thereby providing a comprehensive framework for understanding consumer behaviour in the adoption of technology. The model builds upon 8 earlier foundational theories, the Theory of Reasoned Action (TRA) [22] the Technology Acceptance Model (TAM) [23] the Motivational Model [24] the Theory of Planned Behaviour (TPB) [25] a combined TBP/TAM [26] the Model of PC Utilization [27]. Innovation Diffusion Theory (IDT) [28] and Social Cognitive Theory (SCT) [29].

As cryptocurrency continues to gain traction not only as a medium for transferring value but also as a form of investment, understanding the factors that influence its adoption becomes increasingly important. The UTAUT2 model has been effectively utilized to examine a range of technology adoptions, including mobile health applications [30] mobile banking [31] educational platforms [32] and cryptocurrency technologies [18, 33] as well as cryptocurrency applications [17].

Building upon this framework, the present study adopts key constructs from the UTAUT2 model namely, performance expectancy, effort expectancy, social influence, facilitating conditions, and price value while excluding moderating variables. Additionally, financial literacy and trust are integrated as extended constructs to better capture the factors influencing cryptocurrency adoption. Financial literacy is critical for enabling individuals to assess and manage the risks and complexities associated with financial products, including digital assets such as cryptocurrencies. In the absence of adequate literacy, individuals may face challenges in making informed financial decisions and achieving desirable economic outcomes [29]. Similarly, perceived trustworthiness plays an important contextual role in increasing a system's adaptability and user acceptance [19]. Given the broad levels of financial knowledge and varying degrees of institutional and technological trust, this study extends the UTAUT2 framework to incorporate financial literacy and trust, offering a more comprehensive understanding of the factors shaping cryptocurrency adoption illustrated in Figure 1.

2.2. Hypothesis Development

2.2.1. Performance Expectancy

Performance expectancy refers to the extent to which individuals believe that using technology will provide benefits and improve their ability to perform certain tasks [20]. In this study, PE is examined in relation to its influence on cryptocurrency adoption. The rationale behind this relationship is that individuals are more likely to adopt cryptocurrency if they perceive it as beneficial for their financial well-being and transactional efficiency. According to the UTAUT model, performance expectancy significantly influences behavioral intentions toward adopting new technologies [21]. Since cryptocurrency offers advantages such as high potential returns, fast transactions, and financial accessibility, individuals with high performance expectancy are expected to have a stronger inclination toward adoption. Studies in the United States [34] highlight that users adopt cryptocurrency when they see opportunities for financial growth and streamlined transactions. Similarly, research in Saudi Arabia [33] and Malaysia [35] confirms that performance expectancy, along with trust and price value, significantly influences behavioral intentions toward cryptocurrency adoption. Based on previous research, incorporating performance expectancy as a predictor of cryptocurrency adoption is both appropriate and well-supported by literature, particularly given the perceived benefits of using cryptocurrency as an emerging technology. This leads to the following hypothesis:

H_1: Performance expectancy positively affects the behavioral intention to use cryptocurrency.

2.2.2. Effort Expectancy

Effort expectancy describes the extent to which users perceive technology as simple and easy to operate [20]. In this study, effort expectancy is examined in relation to its impact on cryptocurrency adoption, as ease of use plays a critical role in determining whether users engage with digital assets. Perceived ease of use plays a crucial role in technology adoption, as users are more inclined to engage with a system when they believe it requires minimal effort to operate [23]. In the context of cryptocurrency Platforms that minimize complexity and enhance usability reduce users' cognitive effort, making adoption more likely. When users perceive that they can navigate cryptocurrency transactions with ease, they are more inclined to integrate digital assets into their financial activities. Khan, et al. [36] found that effort expectancy significantly influences cryptocurrency investment decisions. Similarly, Aljohani [30] examined m-health adoption and found that effort expectancy significantly influences users' intention to engage with digital health applications. The study suggests that when users perceive a system as intuitive and easy to navigate, they are more likely to adopt it. However, Bland, et al. [34] reported that effort expectancy does not significantly influence attitudes toward investing, potentially due to the growing accessibility of cryptocurrency platforms, which may reduce perceived barriers to entry. Similarly, Arias-Oliva, et al. [18] and Alomari and Abdullah [33] found no significant relationship between effort expectancy and cryptocurrency adoption. Taken together, these findings suggest that effort expectancy is a valid construct for examining cryptocurrency adoption and may offer valuable insights into improving adoption rates by enhancing perceived ease of use. Therefore, it is reasonable to hypothesize that effort expectancy influences cryptocurrency adoption:

H_2: Effort expectancy positively affects the behavioral intention to use cryptocurrency.

2.2.3. Social Influence

Social influence refers to the degree to which individuals feel that significant people in their lives, such as family and friends, encourage them to adopt a particular technology [20]. In this study, social influence is examined about its impact on cryptocurrency adoption. Social influence contributes to behavioral intention in technology adoption, particularly when trust and peer validation play a major role in decision-making [20]. Given the volatility and perceived risk of cryptocurrency, potential adopters are likely to seek reassurance from their social networks before engaging in transactions. Social influence plays a significant role in cryptocurrency investment, as investors, much like consumers of other goods and services, are frequently influenced by peers, trends, and social media [34]. On the other hand, scepticism or negative perceptions within social circles may discourage participation. This influence is supported by empirical evidence. Alomari and Abdullah [33] demonstrated that social influence is a key determinant of cryptocurrency adoption across different demographics. These findings suggest that leveraging social influence through educational campaigns, social media endorsements, and community-driven discussions may enhance cryptocurrency adoption. Contradictory, Arias-Oliva, et al. [18] study in Spain and Bland, et al. [34] in the United States shows that social influence has no significant effect on cryptocurrency adoption. This suggests that while social influence can generate awareness and interest, other factors such as individual knowledge and risk perception may also play a role in shaping cryptocurrency adoption. Given these insights, it is appropriate to examine social influence as an independent variable alongside other constructs to assess its relative impact on cryptocurrency adoption behavior. Accordingly, the following hypothesis is proposed:

H_3: Social influence positively affects the behavioral intention to use cryptocurrency.

2.2.4. Facilitating Conditions

Facilitating conditions represent individuals' perceptions of the availability of resources and support that enable them to carry out a specific behavior [21, 37]. In this study, facilitating conditions are examined in relation to their influence on cryptocurrency adoption. According to the Unified Theory of Acceptance and Use of Technology (UTAUT), facilitating conditions significantly impact technology adoption, as they determine whether individuals have the necessary resources and support to use a new technology effectively [21]. In the case of cryptocurrency, the availability of secure financial platforms, strong internet infrastructure, and regulatory clarity reduces uncertainty and enhances user confidence in digital transactions. When operational infrastructure is in place and supports the adoption of applications, the intention to use these technologies increases Restuputri, et al. [17]. Jena [31] also emphasized that facilitating conditions significantly influence blockchain adoption in the banking sector, particularly when supported by initial trust and government regulations. Similarly, Arias-Oliva, et al. [18] found that facilitating conditions have a significant effect on cryptocurrency adoption. However, contrasting evidence from Recskó and Aranyossy [38] suggests that facilitating conditions are not a significant predictor of intention to use cryptocurrency. Based on these findings, facilitating conditions serve as a foundational support system for cryptocurrency adoption, with strong regulatory frameworks and reliable financial infrastructure playing a crucial role in shaping users' confidence in adopting blockchain and cryptocurrency technologies. Therefore, the following hypothesis is proposed:

H_4: Facilitating conditions positively affects the behavioral intention to use cryptocurrency.

2.2.5. Trust

Trust is defined as the belief that the trustee will act cooperatively to meet the trustor's expectations without exploiting its vulnerabilities [39]. This notion emphasizes the importance of cooperation and the avoidance of opportunistic behavior in trust-based relationships. Trust has also been shown to significantly influence users' attitudes both before and after system use [40]. Building on this, trust has consistently been identified as a key predictor of behavioral intention in technology adoption models. It not only shapes users' initial perceptions but also influences their willingness to engage with and continue using digital systems. Recent studies have reaffirmed this relationship across diverse platforms. Prior studies support this role, Shahzad, et al. [19] found that trust strengthens the link between cryptocurrency awareness and ease of use, while Neupane, et al. [41] showed that trust significantly enhances adoption intentions in smart city technologies. Given that cryptocurrency is a relatively new form of transactional and financial technology, user trust is essential for its adoption. Therefore, the following hypothesis is proposed:

H_5: Trust positively affects the behavioral intention to use cryptocurrency.

2.2.6. Price value

Price value is defined as the trade-off consumers make between the benefits they receive from using a technology and the monetary cost required to access it. When the perceived benefits exceed the cost, price value is considered positive, increasing the likelihood of adoption [20]. In this study, PV is examined in relation to its impact on cryptocurrency adoption, as users are more likely to engage with technologies they perceive as valuable and worthwhile relative to their cost. According to UTAUT2, price value is a key determinant of technology adoption, particularly when technology involves financial costs [20]. Individuals are more likely to adopt a technology when they perceive that its benefits outweigh its associated expenses. In the case of cryptocurrency, users may be motivated by lower transaction fees, decentralized financial opportunities, and investment returns, leading to a positive price value perception. Restuputri, et al. [17] indicate that lower transaction fees boost the perceived price value by reducing the financial burden on users. This cost advantage makes technology more attractive for adoption. Abbasi, et al. [42] also explain that price value has a significant positive effect on cryptocurrency adoption, indicating that users are more likely to adopt a technology when its perceived value outweighs the associated financial costs. However, when users view cryptocurrency as too expensive due to transaction fees, security risks, or market fluctuations, its adoption may be hindered. Yeong, et al. [35] argue that fluctuations in cryptocurrency prices influence users' perceptions of their price value, as their monetary cost varies in response to market dynamics, potentially deterring adoption. Considering that individuals are more likely to adopt a technology when its perceived benefits outweigh its costs, the following hypothesis is proposed to examine the effect of price value on cryptocurrency adoption:

H_6: Price value positively affects the behavioral intention to use cryptocurrency.

2.2.7. Financial Literacy

Financial literacy is defined as the ability to make informed judgments and effective decisions regarding the use and management of money Hastings, et al. [29] a concept originally proposed by the [43]. In the context of cryptocurrency adoption, it includes an understanding of digital currencies, blockchain technology, and the potential risks and benefits involved. Lusardi and Mitchell [44] emphasize that financial literacy has a direct impact on financial decision-making, as research using econometric models and experiments has confirmed its influence while distinguishing it from other factors like education and cognitive ability. Financial literacy not only provides investors with a structured approach to making investment decisions but also enhances their confidence in executing rational and well-calculated judgments [45]. Supporting this view, Khan, et al. [36] found that individuals with higher financial knowledge exhibit greater confidence in managing digital assets, thereby positively influencing cryptocurrency investment behaviour in India. However, enhanced literacy may also contribute to overconfidence, potentially distorting risk perception and encouraging overly aggressive investment strategies [46]. Similarly, Arias-Oliva, et al. [18] found that financial literacy was not a statistically significant predictor of cryptocurrency adoption, suggesting its influence may vary depending on context. Given that financial literacy influences investment decisions, and that cryptocurrency can serve as an investment technology, the following hypothesis is proposed to examine the effect of price value on cryptocurrency adoption:

H_7: Financial literacy positively affects the behavioral intention to use cryptocurrency.

2.3. Conceptual Framework

Framework of relationships between each variable and factors affecting investment

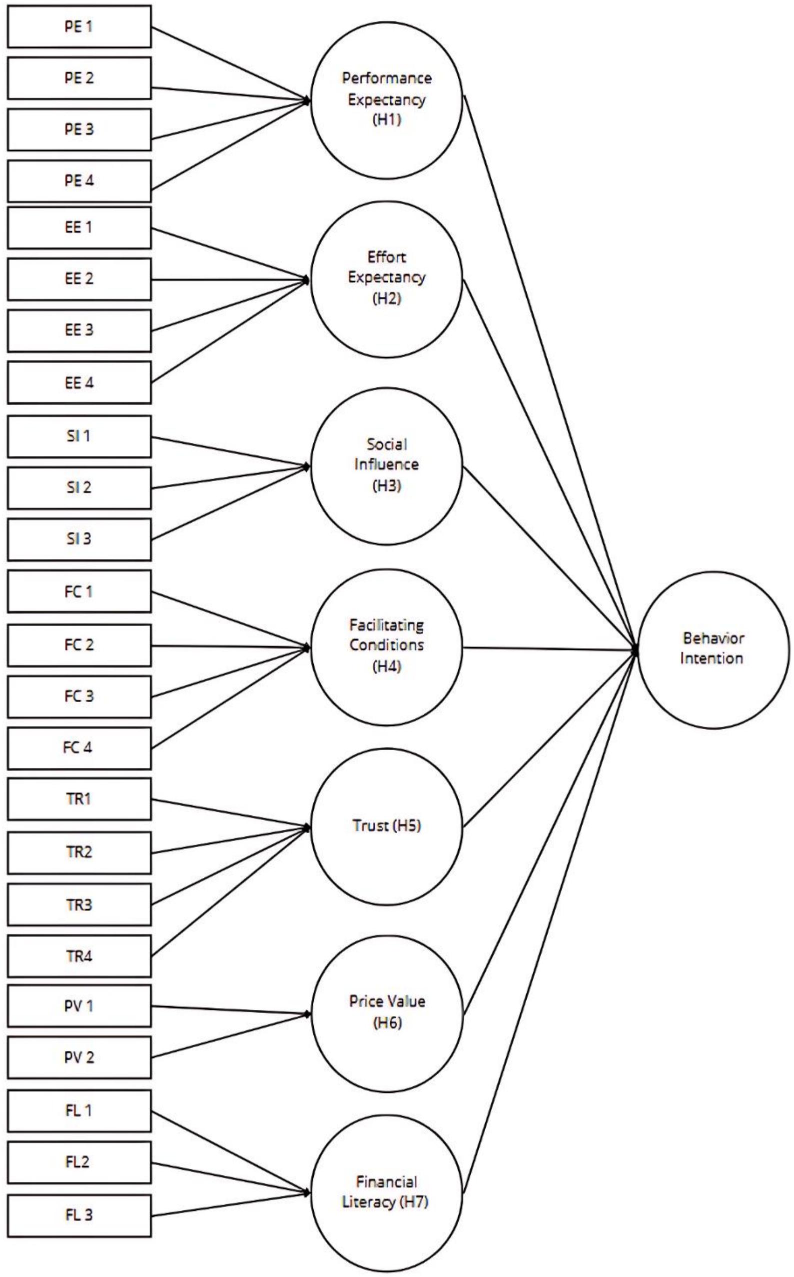

Figure 1.
Research Model Framework.

3. Methodology

3.1. Data and Sample

This research employed a quantitative methodology using a survey approach to assess respondents' perceptions of cryptocurrency. The sample comprises educated adults aged 18 years and above, as this demographic group is considered to possess adequate knowledge, exposure, and legal eligibility to engage with cryptocurrencies and digital financial technologies. Individuals aged 18 and above are presumed to have sufficient familiarity with emerging digital tools. In contrast, those aged 18 and below may lack adequate exposure and practical experience with cryptocurrencies, potentially limiting their ability to provide informed responses. Consequently, respondents aged 18 and older are deemed more appropriate for evaluating cryptocurrency adoption trends.

A non-probability purposive sampling approach was utilized in this study, as suggested by Sekaran [47] due to the absence of an identifiable sampling frame. The minimum required sample size for the regression model was determined using G*Power 3.1 (Linear multiple regression: Fixed model, R^2 deviation from zero), this indicated that at least 153 respondents were necessary to detect a medium effect size ($f^2 = 0.15$) with seven predictor variables, assuming a statistical power of 95% and a significance level of 5%. This calculation follows the regression-based power analysis approach recommended [48, 49] which is particularly appropriate for PLS-SEM studies involving multiple latent constructs and path relationships. The actual number of valid responses collected was 206, exceeding the minimum requirement, thereby ensuring the sufficiency, reliability, and robustness of the data for subsequent analysis.

The data was collected using an online questionnaire developed and distributed via Google Forms. The survey was disseminated primarily through social media platforms and personal networks, including friends, colleagues, family members, and academic survey exchange communities on Telegram. No initial screening based on age or gender was conducted, as the survey was openly accessible to all participants.

Due to the online nature of the survey, participation was limited to individuals with access to the Internet and at least a basic level of digital literacy, which is a reasonable assumption considering the research's focus on cryptocurrency adoption—an inherently digital phenomenon. Nevertheless, this sampling constraint may introduce a degree of selection bias, which is acknowledged as a limitation in the generalizability of the findings.

3.2. Measurement Approach

The measurement scales utilized in this study are adapted from established models, as presented in Table 1. In financial literacy and technology acceptance research, Phelps and Metzler [50] distinguish between objective financial knowledge assessed through standardized tests and self-assessed financial literacy, reflecting individuals' perceived understanding of financial concepts. This study adopts the self-assessment approach because cryptocurrency adoption tends to be driven more by perceived financial competence than actual financial knowledge. From a behavioral perspective, users' perceived financial literacy typically plays a greater role in shaping their adoption behavior compared to their objectively tested proficiency. Hence, self-perceived financial literacy is considered a more relevant predictor of cryptocurrency adoption. All questionnaire items were measured using a 4-point Likert scale: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

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Table 1.
Construct, Indicator, Measure, and their theoretical foundation.

Construct	Indicator	Measure	Source
Performance Expectancy	PE1	Using cryptocurrencies will provide better opportunities for me to accomplish important personal objectives.	Adapted from the UTAUT2 scale Venkatesh, et al. [20]
	PE2	Using cryptocurrencies will enhance my overall quality of life.	
	PE3	Using cryptocurrencies will enable me to achieve my goals more efficiently.	
	PE4	Using cryptocurrencies will help me gain better control over my financial decisions.	
Effort Expectancy	EE1	It will be easy for me to learn how to use cryptocurrencies	Adapted from the UTAUT2 scaleVenkatesh, et al. [20]
	EE2	Cryptocurrencies for me is easy to understand and straightforward to use.	
	EE3	I believe it will be easy for me to adopt cryptocurrencies.	
	EE4	I find it manageable to develop expertise in using cryptocurrencies.	
Social influence	SI1	The people whose opinions I value will encourage me to use cryptocurrencies.	Adapted from the UTAUT2 scale Venkatesh, et al. [20]
	SI2	The people who matter to me will expect me to use cryptocurrencies.	
	SI3	The people whose opinions I value would like me to use cryptocurrencies	
Facilitating conditions	FC1	I possess the resources needed to adopt cryptocurrencies.	Adapted from the UTAUT2 scale Venkatesh, et al. [20]
	FC2	There is enough information on how to adopt cryptocurrency.	
	FC3	Cryptocurrencies are compatible with other technologies that I use.	
	FC4	I can get help if I have difficulty using cryptocurrencies.	
Trust	TR1	I believe that using cryptocurrency will serve my best interest.	Adapted on Shahzad, et al. [19] based on Carter, et al. [51] and Venkatesh, et al. [40].
	TR2	I trust that the information provided about cryptocurrency is honest and transparent.	
	TR3	I think that Cryptocurrency should be backed by Government to ensure the security.	
	TR4	I consider Bitcoin to be a trustworthy and secure form of currency.	
Price Value	PV1	I intend to use cryptocurrencies if it is cheaper than traditional transaction.	Adapted from the UTAUT2 scale Venkatesh, et al. [20]
	PV2	I will be willing to use cryptocurrency if there is a special discount compared to other transactional methods.	
Financial literacy	FL1	I have a good level of financial knowledge	Based on Financial Literacy Education and Economic Outcomes Hastings, et al. [29]
	FL2	I have a high capacity to deal with financial matters	
	FL3	I have previously helped others invest in cryptocurrency by explaining basic concepts.	
Behavior Intention	BI1	I intend to use cryptocurrencies	Adapted from the UTAUT2 scale Venkatesh, et al. [20]
	BI2	I predict that I will use cryptocurrencies	

4. Results and Discussions

4.1. Descriptive Analysis

Table 2 presents the demographic characteristics of the respondents. A total of 206 valid responses were obtained and analyzed using SPSS version 25. The sample is predominantly male, comprising 60.7% of the total. In terms of age distribution, the majority (84.5%) fall within the 18 to 24-year-old range. Educational background data show that most participants hold a bachelor's degree (90.3%), and a significant portion of the respondents (73.8%) are currently enrolled as students.

Table 2.
Demographic Profiles of respondents.

Profile	No. Frequency	Percentages (%)
Gender		
Male	125	60,7
Female	81	39,3
Total	206	100
Age		
18-24	174	84,5
25-34	16	7,8
35-44	2	1,0
45-54	10	4,9
55+	4	1,9
Total	206	100
Education Level		
Highschool	19	9,2
Diploma	0	0,0
Bachelor	186	90,3
Master	1	0,5
PhD	0	0,0
Total	206	100
Employment		
Student	152	73,8
Private Sector	34	16,5
Self Employed	17	8,3
Govt. Servant	0	0,0
Retired	3	1,5
Total	206	100
Usage Experience		
Have used Cryptocurrency	113	54,9
Never Used Cryptocurrency	93	45,1
Total	206	100

4.2. Structural Equation Modeling Using PLS-SEM

Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS 4.1.1.2 to test the hypothesized relationships. PLS-SEM was preferred over covariance-based SEM (CB-SEM) due to its ability to retain more indicators, thereby enhancing model validity and reliability while uncovering insights that may otherwise be overlooked [52]. Following a two-step procedure [53] we first assessed the reliability and validity of the measurement model, followed by an evaluation of the structural model.

4.3. Measurement Model: Validity and Reliability Test

Table 3.
Convergent validity.

Construct	Indicator	Outer Loadings Value Before Removal	Outer loading value after removal
Performance Expectancy (PE)	PE1	0.893	0.893
	PE2	0.866	0.866
	PE3	0.886	0.886
	PE4	0.871	0.871
Effort Expectancy (EE)	EE1	0.857	0.857
	EE2	0.890	0.890
	EE3	0.883	0.883
	EE4	0.838	0.838
Social influence (SI)	SI1	0.821	0.821
	SI2	0.857	0.857
	SI3	0.915	0.915
Facilitating conditions (FC)	FC1	0.789	0.789
	FC2	0.782	0.782
	FC3	0.796	0.796
	FC4	0.746	0.746
Trust (TR)	TR1	0.860	0.864
	TR2	0.780	0.795
	TR3	0.526	-
	TR4	0.875	0.886
Price Value (PV)	PV1	0.938	0.938
	PV2	0.927	0.927
Financial literacy (FL)	FL1	0.821	0.821
	FL2	0.763	0.762
	FL3	0.856	0.856
Behavior Intention (BI)	BI1	0.956	0.956
	BI2	0.953	0.953

To assess convergent validity, the outer loading values of each indicator were examined as per Table 3. According to the threshold recommended [54] indicator loadings should exceed 0.7 to be considered acceptable. In this study, all indicators met this criterion except for TR3. The lower loading of TR3 may be attributed to the nature of its question, which involved the government's involvement in cryptocurrency. Responses likely varied because some participants viewed government backing as enhancing security, while others perceived it as reducing the decentralized and secure nature of cryptocurrency. As a result, TR3 was excluded from the model. With all remaining indicators displaying outer loadings above 0.7, the results confirm that the measurement items are both valid and reliable representations of their respective latent constructs.

Table 4.
Internal Construct Convergent Validity Test.

Composite Reliability	Cronbach's alpha before removal	Cronbach's alpha after removal	Composite reliability (rho_c) after removal	AVE before removal	AVE after removal
Performance Expectancy (PE)	0.902	0.902	0.932	0.773	0.773
Effort Expectancy (EE)	0.890	0.890	0.924	0.752	0.752
Social Influence (SI)	0.832	0.832	0.899	0.749	0.749
Facilitating Conditions (FC)	0.784	0.784	0.860	0.606	0.606
Trust (TR)	0.771	0.808	0.885	0.598	0.721
Price Value (PV)	0.851	0.851	0.931	0.870	0.870
Financial literacy (FL)	0.762	0.762	0.855	0.663	0.663
Behavior Intention (BI)	0.902	0.902	0.953	0.911	0.911

As shown in Table 4 the test results indicate that all indicators used in this study demonstrate convergent validity in measuring their respective latent variables. This is evidenced by the Cronbach's alpha and Composite Reliability values for all constructs exceeding the 0.7 threshold recommended by Hair, et al. [55]. Additionally, the Average Variance Extracted (AVE) values for all constructs were found to be above the minimum acceptable value of 0.50, even prior to the removal of TR3. This suggests that each construct sufficiently explains the variance of its indicators. The removal of TR3 further improved the AVE for the Technology Readiness (TR) construct, increasing it from 0.598 to 0.721. Based on these AVE results, it can be concluded that all constructs in this study meet the criteria for convergent validity and are effective in measuring the intended latent variables.

Table 5.
Discriminant validity test using Heterotrait-Monotrait Ratio (HTMT).

	BI	EE	FC	FL	PE	PV	SI	TR
BI								
EE	0.666							
FC	0.717	0.796						
FL	0.608	0.824	0.726					
PE	0.777	0.717	0.716	0.671				
PV	0.679	0.560	0.643	0.421	0.566			
SI	0.602	0.622	0.660	0.579	0.775	0.586		
TR	0.843	0.700	0.768	0.603	0.915	0.724	0.751	

Table 6.
Discriminant validity Cross loadings.

	BI	EE	FC	FL	PE	PV	SI	TR
BI1	0.956	0.592	0.611	0.534	0.680	0.564	0.522	0.713
BI2	0.953	0.556	0.549	0.502	0.664	0.573	0.482	0.684
EE1	0.463	0.857	0.566	0.579	0.500	0.367	0.404	0.456
EE2	0.525	0.890	0.596	0.584	0.537	0.418	0.472	0.534
EE3	0.590	0.883	0.596	0.664	0.584	0.480	0.452	0.537
EE4	0.496	0.838	0.556	0.556	0.613	0.427	0.537	0.554
FC1	0.509	0.489	0.789	0.485	0.495	0.422	0.385	0.512
FC2	0.466	0.540	0.782	0.411	0.464	0.389	0.426	0.423
FC3	0.504	0.582	0.796	0.499	0.518	0.486	0.460	0.505
FC4	0.403	0.464	0.746	0.384	0.411	0.339	0.402	0.477
FL1	0.364	0.543	0.475	0.821	0.414	0.225	0.323	0.335
FL2	0.306	0.542	0.424	0.762	0.403	0.254	0.329	0.329
FL3	0.574	0.597	0.499	0.856	0.559	0.358	0.493	0.525
PE1	0.677	0.597	0.590	0.534	0.893	0.521	0.620	0.751
PE2	0.555	0.536	0.442	0.487	0.866	0.326	0.570	0.619
PE3	0.633	0.567	0.571	0.538	0.886	0.494	0.623	0.716
PE4	0.603	0.566	0.528	0.481	0.871	0.407	0.564	0.702
PV1	0.577	0.471	0.491	0.354	0.496	0.938	0.500	0.564
PV2	0.533	0.444	0.497	0.310	0.440	0.927	0.427	0.563
SI1	0.411	0.398	0.429	0.355	0.527	0.415	0.821	0.492
SI2	0.421	0.472	0.427	0.426	0.563	0.380	0.857	0.525
SI3	0.522	0.518	0.527	0.480	0.657	0.488	0.915	0.598
TR1	0.677	0.586	0.556	0.480	0.797	0.509	0.620	0.864
TR2	0.487	0.431	0.462	0.341	0.547	0.465	0.457	0.795
TR4	0.673	0.500	0.541	0.463	0.656	0.558	0.501	0.886

Discriminant validity was assessed using both the Heterotrait-Monotrait Ratio (HTMT) and cross-loading analysis, as presented in Tables 5 and 6. The HTMT values for all construct pairs fall below the recommended threshold of 0.90 [56] with the exception of the relationship between Performance Expectancy and Trust, which recorded a value of 0.915. This marginal exceedance suggests a potential conceptual overlap, possibly due to similarities in the wording or interpretation of the indicators. Although theoretically distinct, these constructs may have been understood as reflecting the same underlying belief in the benefits of cryptocurrency. However, cross-loading analysis confirms that each indicator loads more highly on its intended construct than on any other construct—for example, all performance expectancy and trust indicators exhibit their highest loadings on their respective latent variables. This pattern reinforces the distinctiveness of the constructs and supports the argument that the model maintains adequate discriminant validity. Therefore, despite the slightly elevated HTMT value between performance expectancy and trust, the combined evidence from both HTMT and cross-loading criteria justifies the conclusion that the constructs are empirically distinct, and discriminant validity is satisfactorily established.

Table 7.
Discriminant Validity (Fornell-Larcker Criterion).

	BI	EE	FC	FL	PE	PV	SI	TR
BI	0.954							
EE	0.602	0.867						
FC	0.608	0.668	0.779					
FL	0.543	0.690	0.575	0.814				
PE	0.705	0.645	0.610	0.581	0.879			
PV	0.596	0.491	0.529	0.357	0.503	0.933		
SI	0.526	0.538	0.537	0.490	0.677	0.498	0.865	
TR	0.732	0.602	0.616	0.512	0.796	0.604	0.625	0.849

Discriminant validity was further assessed using the Fornell–Larcker criterion, which requires that the square root of each construct's AVE (shown on the diagonal) must be greater than its correlations with any other construct (off-diagonal values) [48]. As shown in Table 7, all constructs meet this criterion. These results indicate that each construct shares more variance with its own indicators than with other constructs, confirming satisfactory discriminant validity across the model according to the Fornell–Larcker standard.

4.4. Structural Model: Assess the Strength of the Hypothesized Associations

Based on the results presented in Table 8, the R-Square (R^2) value for the behavioral intention variable is 0.635, or 63.5%. According to Hair et al. (2011), an R^2 value around 0.75 is substantial; around 0.50 is moderate; and around 0.25 is weak. The Q-Square (Q^2) value for behavior intention is 0.600, which exceeds the 0.50 threshold, indicating strong predictive relevance [55]. These results suggest that the model not only explains behavioral intention well but also demonstrates strong predictive capability.

Table 8.
R-Square and Q-Square Values for Behavioral Intention.

Variable	R-Square	R-Square Adjusted	Q-Square
Behavior Intention (BI)	0.635	0.622	0.600

4.5. Hypothesis Discussion

The results of the outer model assessment indicate that all indicators used in this study meet the established criteria for validity and reliability. Therefore, hypothesis testing can proceed. The hypotheses were tested using a two-tailed approach at a 95% confidence level, corresponding to a significance threshold of $\alpha = 0.05$. According to Hair, et al. [48] a result is considered statistically significant if the T-statistic exceeds 1.96. A bootstrapping of 5.000 subsamples was used and the results are shown in Table 9.

Table 9.
Hypothesis Testing with Standardized Path Coefficients and Significance Values.

Hypothesis	Relation	Standardized Path Coefficient (β)	T Statistic	P-Value	Result
H1	PE -> BI	0.246	2.461	0.014	Accepted
H2	EE -> BI	0.053	0.707	0.480	Rejected
H3	SI -> BI	-0.070	1.112	0.266	Rejected
H4	FC -> BI	0.100	1.644	0.100	Rejected
H5	TR -> BI	0.309	3.351	0.001	Accepted
H6	PV -> BI	0.203	3.196	0.001	Accepted
H7	FL -> BI	0.111	1.857	0.063	Rejected

Performance expectancy (H1) has a standardized path coefficient of 0.246, indicating a positive and statistically significant relationship with behavioral intention to use cryptocurrency, supported by a p-value well below the 0.05 threshold. This suggests that individuals who perceive greater performance benefits from using cryptocurrency are more likely to adopt cryptocurrency. The strength and significance of this relationship imply that users are motivated by the perceived utility cryptocurrency brings to their personal and financial lives. For instance, if respondents believe that cryptocurrency enables faster and more efficient financial transactions, enhances control over financial decisions, or supports greater independence, they are more inclined to view it as a valuable financial or technological tool. These findings are consistent with previous research by Abbasi, et al. [42] which also highlights performance expectancy as a significant determinant of technology adoption. This aligns with the original UTAUT2 framework proposed by Venkatesh, et al. [20] where individuals are more likely to adopt a technology when they perceive that using it will help them achieve gains in performance or support the accomplishment of important goals.

Effort expectancy (H2) was rejected, indicating that effort has no statistically significant effect on the intention to use of cryptocurrency. The result suggests that whether users find cryptocurrency easy or difficult to use does not meaningfully influence their intention to use cryptocurrency. This may be attributed to several factors, such as increasing digital fluency and technology exposure among the sampled population, particularly younger and more educated individuals who may not view ease of use as a barrier. For them, other factors like trust, performance expectancy, or perceived value may carry greater weight in the adoption decision. Alternatively, some users may find cryptocurrency difficult to understand but still choose to adopt cryptocurrency, while others may understand cryptocurrency thoroughly yet have no intention of using it due to concerns unrelated to ease of use, such as market volatility, regulatory uncertainty, or personal financial preferences. In this sense, ease of use is not necessarily linked to adoption behavior, and choosing not to adopt cryptocurrency does not imply a lack of understanding. These findings are consistent with prior studies by Khan, et al. [36] which also found no significant relationship between effort expectancy and cryptocurrency adoption, while contrasting with findings by Khan, et al. [36] who reported a significant positive effect. Such discrepancies may result from differences in research models, demographic characteristics, or contextual factors that shape user perceptions and behaviors.

Social influence (H3) was rejected, indicating that social influence does not have a statistically significant effect on individuals' intention to use cryptocurrency. The rejection of H3 suggests that respondents are unlikely to base their adoption decisions on the opinions or preferences of people they consider important. In the context of cryptocurrency, which is often associated with financial risk, security concerns, and regulatory uncertainty, individuals may place greater emphasis on personal judgment and direct experience rather than social norms or peer encouragement. Financial decision making is typically more private and self-driven compared to the adoption of other consumer technologies, making users less susceptible to social pressure. It is also possible that individuals within the sample may be exposed to conflicting opinions about cryptocurrency, leading them to discount social input altogether. Moreover, even if respondents receive recommendations or observe social trends, they may still prioritize trust in technology, perceived performance benefits, or personal financial goals over external influence. These findings align with prior research by Bland, et al. [34] which also reported no significant relationship between social influence and cryptocurrency adoption. However, they contrast with studies such as Alomari and Abdullah [33] where social influence was found to play a significant role in the adoption of other technologies. This inconsistency may result from differences in cultural context, technology type, perceived risk, or the demographic characteristics of the sampled population.

Facilitating conditions (H4) were rejected, indicating that facilitating conditions do not have a statistically significant influence on individuals' intention to use cryptocurrency. The rejection of this hypothesis suggests that such external support systems do not play a decisive role in shaping users' adoption behavior. Improvements in usability, accessibility, or the availability of help resources do not significantly influence whether someone intends to use cryptocurrency. This is likely due to individuals who are already interested in cryptocurrency may be technologically proficient, self-motivated, or familiar with digital tools, which reduces their dependence on external support. These users may also have a greater sense of autonomy and confidence in exploring complex technologies, making facilitating conditions less critical in their decision-making process. Alternatively, even if the infrastructure or support exists, users may still be hesitant to adopt cryptocurrency due to concerns related to trust, risk, regulation, or personal financial priorities factors that are more psychologically or economically driven than infrastructure related. These findings align with those of Recskó and Aranyossy [38] who also concluded that facilitating conditions were not a determining factor in cryptocurrency adoption. However, this contrasts with research by Restuputri, et al. [17]; Jena [31] and Arias-Oliva, et al. [18] where facilitating conditions were found to have a significant effect on adoption. These divergent results may be due to differences in the study context, the maturity of cryptocurrency infrastructure in different regions, or the demographic characteristics and digital competence of the sample population.

Trust (H5) is accepted, indicating that trust has a positive and significant influence on the intention to use of cryptocurrency, with a path coefficient of 0.309, making trust the strongest predictor among all independent variables. This finding suggests that individuals who have greater trust in the information and technology underlying cryptocurrency particularly regarding its security, reliability, and transparency are more likely to adopt it. Notably, the indicator TR3, which pertains to institutional trust (i.e., the belief that cryptocurrency should be backed by the government), was removed due to its low outer loading (0.526). This implies that users do not strongly associate trust with institutional involvement. Instead, trust appears to be more closely linked to system-level attributes such as technological security, transparency, and the integrity of information, as evidenced by the higher outer loadings of TR1, TR2, and TR4 compared to TR3. Although the Indonesian government does not oppose cryptocurrency outright, it regulates it as a tradable commodity while restricting its use as a payment method. The findings of this study suggest that such institutional support does not significantly enhance users' trust. This may be because government involvement is perceived to conflict with the foundational principle of decentralization that underpins cryptocurrency. These findings align with prior research by Neupane, et al. [41] who both highlight the critical role of trust in facilitating technology adoption, especially in environments characterized by financial risk or technological innovation.

Price value (H6) was accepted, indicating a positive and statistically significant influence on individuals' intention to use cryptocurrency, with a path coefficient of 0.203. The acceptance of this hypothesis suggests that individuals are more likely to adopt cryptocurrency when they perceive cryptocurrency to offer greater economic value or financial advantages compared to traditional payment or investment methods. This includes lower transaction fees, better returns on investment, or access to financial tools not available through conventional systems. Respondents may evaluate whether using cryptocurrency saves them money, provides better control over investment returns, or offers greater long-term value and if they perceive a net gain, they are more inclined to adopt it. In essence, cryptocurrency adoption is affected by users' cost-benefit analysis, where financial benefit is a key motivating factor. The findings of this study are consistent with prior research [42] who examined technology adoption in cryptocurrency systems, and Restuputri, et al. [17] who analysed user intentions on investment platforms. Both studies identified price value as a critical determinant of adoption, reinforcing that economic practicality is a major driver in the decision to engage with emerging financial technologies. This relationship may become even more significant as cryptocurrency becomes more widely adopted, further reinforcing the importance of perceived economic benefits in shaping adoption behavior.

Financial literacy (H7) was rejected, indicating that financial literacy does not have a statistically significant influence on individuals' intention to use cryptocurrency. This suggests that users' decisions to adopt cryptocurrency are not directly determined by their level of financial knowledge. Financially literate individuals may, in fact, exhibit greater caution or skepticism toward cryptocurrency, recognizing its volatility, lack of regulatory oversight, and speculative nature. As a result, they may choose to avoid such investments despite having a thorough understanding of the underlying financial mechanisms. Conversely, individuals with limited financial literacy may still adopt cryptocurrency based on perceived short-term gains, social influence, or general curiosity, rather than informed decision-making. This finding aligns with previous studies by Arias-Oliva, et al. [18] which also found no significant relationship between financial literacy and cryptocurrency adoption. However, it contrasts with Khan, et al. [36] who reported a positive influence of financial literacy on cryptocurrency investment behavior. These divergent findings may be attributed to regional, demographic, or methodological differences, or to variations in how financial literacy and adoption are defined and measured. Overall, this result suggests that increasing self-perceived financial literacy alone may not necessarily lead to higher adoption rates of cryptocurrency, as individual risk preferences and attitudes toward emerging technologies play a more dominant role.

5. Conclusion and Suggestions

5.1. Conclusion

This study provides a comprehensive view of the key factors influencing cryptocurrency adoption in Indonesia by extending the UTAUT framework with the inclusion of trust and financial literacy. The findings highlight that performance expectancy, trust, and price value are significant drivers of adoption, with trust being the most influential. These results emphasize the importance of building user confidence and clearly demonstrating the practical value of cryptocurrency platforms.

While some traditional UTAUT constructs such as effort expectancy, social influence, and facilitating conditions were not significant in this context, the study offers valuable insights for both researchers and practitioners seeking to understand or promote cryptocurrency use in emerging markets. Ultimately, this research contributes to the growing discourse on digital finance in Southeast Asia and offers a foundation for more targeted, context-sensitive studies in the future.

5.2. Theoretical and Practical Implications

This study examines the determinants of individuals' intention to use cryptocurrency by extending the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework to include financial literacy and trust as additional independent variables. From a theoretical perspective, the research contributes to the expanding body of literature on UTAUT and its applicability to emerging financial technologies. Utilizing Partial Least Squares Structural Equation Modelling (PLS-SEM), the findings reveal that performance expectancy, trust, and price value significantly influence the intention to use cryptocurrency, with trust identified as the most influential predictor. In contrast, effort expectancy, social influence, facilitating conditions, and financial literacy did not demonstrate statistically significant effects in the Indonesian context. These findings are consistent with portions of the existing literature, while also offering unique insights specific to the regional context. The research underscores the contextual nature of technology adoption behaviour and demonstrates that the inclusion of trust and financial literacy enhances the explanatory power of the UTAUT2 framework, particularly within Indonesia. As such, this study provides valuable empirical evidence that both supports and extends

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existing theoretical models, thereby enriching academic discourse on cryptocurrency adoption, especially in emerging markets.

From a practical perspective, the findings offer valuable implications for both policymakers and businesses. For policymakers, the prominence of trust highlights the need to establish transparent and secure regulatory environments that encourage cryptocurrency adoption while preserving its decentralized nature. For businesses and platform developers, the significant role of performance expectancy suggests that efforts should focus on delivering and clearly communicating tangible benefits such as efficiency, accessibility, and reliability. These factors appear to be more influential in driving adoption than facilitating conditions or effort expectancy, which were found to have no significant impact in this study.

From the user's perspective, rejecting the financial literacy hypothesis implies that financial literacy alone does not significantly influence cryptocurrency adoption intention. In fact, individuals with strong financial knowledge may choose not to adopt cryptocurrency because they recognize the risks or believe that alternative investments are more suitable for their financial goals. Conversely, those with lower financial literacy may be more easily influenced by hype or short-term gains without fully understanding the associated risks. This finding offers a valuable insight for users: not investing in cryptocurrency, even if one is financially literate, is a valid and informed decision. Users should not feel pressured by the fear of missing out (FOMO) often driven by trends or influencers. Instead, this research encourages individuals to evaluate cryptocurrency adoption based on their personal risk tolerance, financial understanding, and investment philosophy, rather than feeling compelled to follow others whether they are financially literate.

5.3. Limitations and Recommendations

Several limitations should be acknowledged. The sample was drawn exclusively from Jakarta, which may not represent broader Indonesian perspectives. Moreover, the demographic profile was concentrated, with 73.8% of students and 84.5% aged 18–24, limiting generalizability. Future research should incorporate a more diverse sample across age, education, and regions. As this study adopts a broad perspective, future research may consider disaggregating specific applications (e.g., trading, payments, DeFi) to better understand distinct adoption patterns.

The removal of the TR3 indicator, related to government-backed cryptocurrency, due to its low outer loading (0.526), suggests that users may not associate trust with institutional involvement. This highlights the importance of distinguishing between system-level and institutional trust in future studies. Additionally, financial literacy was self-assessed and may not reflect actual knowledge; future research should include objective measures and compare behaviours between users and non-users. For policymakers, the findings emphasize the need to foster transparent, secure environments without undermining the decentralized nature of cryptocurrency.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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