CRYPTOCURRENCY ADOPTION ENHANCES FINANCIAL INCLUSION MEDIATED BY USER SATISFACTION AND PERCEIVED ECONOMIC EMPOWERMENT IN INDONESIA

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ABSTRACT

Financial inclusion remains a significant challenge in developing countries, where over 1.7 billion people lack access to bank accounts due to high costs, limited infrastructure, and a lack of formal identification. As a result, many rely on insecure informal systems, which results in user dissatisfaction in the long run. Cryptocurrencies like Bitcoin, powered by blockchain technology, offer a promising alternative by enabling fast, low-cost, and highly secure transactions without the need for traditional banking institutions. This study empirically investigates how cryptocurrency adoption can enhance financial inclusion in Indonesia, both directly and indirectly through mediating factors such as user satisfaction, trust in financial institutions, and perceived economic empowerment. The study explores whether cryptocurrency use fosters financial autonomy, strengthens trust in digital financial services, and increases satisfaction with financial technologies—factors that may encourage broader participation in the formal financial system. Data were collected through a Google Form survey involving 147 respondents, Indonesian cryptocurrency investors. Using Partial Least Squares (PLS) analysis, results reveal that while cryptocurrency adoption significantly improves user satisfaction, trust in the financial system, and economic empowerment, with scores of 0.888, 0.732, and 0.851, respectively. Cryptocurrency adoption also has a direct effect on financial inclusion, with a score of 0.635. However, perceived economic empowerment emerged as a strong mediating variable, with a score of 0.556 to financial inclusion, compared to user satisfaction with a mediating score of 0.282 to financial inclusion. These findings highlight that high economic empowerment is a key value driver for crypto investors. The results show platforms emphasizing accessibility, security, and transparency may be better positioned to support financial inclusion in emerging economies like Indonesia, without having to engage in a formal financial system.
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INTRODUCTION

Financial inclusion remains a significant challenge in developing countries, where limited access to savings, banking, credit, and insurance keeps many in poverty. About half of adults worldwide reported saving money in the past year. In high-income economies, 71 percent reported saving, while in developing economies, 43 percent did (Demirgüç-Kunt et al., 2018). Big-tech companies currently dominate the development of Fintech, particularly in terms of increasing financial inclusion (Cao et al., 2023). The World Bank reports that over 1.7 billion people lack bank accounts, mostly in developing regions. Barriers such as high costs, weak infrastructure, and lack of formal ID force many to rely on insecure, costly informal systems. Cryptocurrencies like Bitcoin, powered by Blockchain, offer a promising alternative enabling fast, low-cost, and secure transactions without traditional banks. With mobile devices and internet access, individuals can connect to the global financial system (El Hajj & Farran, 2024).

The crypto world will eventually shift into the most attractive investment in the digital economy. Their decentralized nature provides greater security and privacy, especially in areas with unstable financial institutions. By lowering transaction costs and easing cross-border transfers, cryptocurrencies can play a vital role in advancing financial inclusion and economic growth. The rapid emergence of cryptocurrencies has significantly transformed the landscape of financial transactions and investment strategies across the globe. Initially introduced as a decentralized digital alternative to

traditional currencies, cryptocurrencies have gained substantial attraction among various demographics, particularly in emerging markets (Omane-Adjepong & Alagidede, 2020).

Bitcoin and other cryptocurrencies can be traded on Indonesian commodity futures exchanges, as outlined in Regulation No. 5 of 2019, issued on February 8, 2019. The Indonesian cryptocurrency market has experienced rapid growth, both in terms of user adoption and transaction volume. Between 2020 and early 2022, the number of crypto investors expanded dramatically from just over half a million to 12.4 million accompanied by average daily transactions of approximately IDR 2.35 trillion and an annual total reaching IDR 859 trillion in 2021. Research results show that during the pandemic, Indonesian people searched for information about crypto through the internet, which will influence their investment decision in the adoption of cryptocurrency. The intention to adopt cryptocurrencies can be affected by investor trust (Abbasi et al., 2021), and research also finds that financial and emotional value from the investor's perspective (García-Monleón et al., 2023).

Bitcoin, Ethereum, and Dogecoin emerged as the most frequently traded digital assets, primarily driven by young adults aged 18 to 34. Indonesia is currently ranked 13th globally in terms of crypto adoption, with ownership penetration slightly exceeding the global average (16% compared to 15%). One of the benefits of cryptocurrencies is decentralization. It would allow online payments to be sent directly from one party to another without going through a financial institution. Hence, cryptocurrencies are not restricted to a specific geographic area and can be traded around the world (Holtmeier & Sandner, 2019). Cryptocurrencies also prove to have a crucial role in banking sectors and foreign debt (Le, 2025). Research indicates a two-way causal relationship between Bitcoin price fluctuations and online public interest, as measured by Google Trends signifying that Indonesian investors tend to respond actively to digital information, particularly during high-volatility events such as the COVID-19 pandemic. Although cryptocurrencies are not recognized as legal tender, they are legally acknowledged by regulators as commodities eligible for trading, thereby reinforcing their legitimacy within the investment ecosystem and reflecting the government's evolving openness toward digital financial innovations.

While previous research (El Hajj & Farran, 2024; Ozili, 2023) has highlighted the positive impact of cryptocurrencies on financial inclusion and empowerment in emerging markets, this study provides a focused replication within the Indonesian context an archipelagic nation marked by geographic fragmentation, infrastructure challenges, and unequal access to formal financial services. Unlike broader global studies, this research specifically examines the role of cryptocurrency adoption in enhancing financial inclusion through the mediating effects of user satisfaction, trust in financial institutions, and perceived economic empowerment. Its novelty lies in empirically analyzing how these factors interact to shape financial behaviors in areas where traditional banking is limited. Given Indonesia's fast-growing digital ecosystem, high mobile phone penetration, and rising interest in decentralized finance, the study offers valuable insights for policymakers, fintech developers, and financial institutions aiming to design inclusive digital financial solutions (El Amri, Mohammed & Bakr, 2021; Demirgüç-Kunt et al., 2018). Through a comprehensive analytical framework, this study endeavors to offer a deeper insight into how digital financial innovations particularly cryptocurrencies can drive inclusive financial development within emerging economies, with Indonesia serving as the focal case

The paper is organized as follows: a brief introduction to the phenomenon and research background in Section 1. A review of theory and literature as a development for the research framework in Section 2. The research methodology used and characteristics of respondents are described in Section 3, and results and discussions are presented in Section 4, and the paper concludes in Section 5.

LITERATURE REVIEW

Cryptocurrencies are digital assets that function through decentralized systems, meaning no central authority governs them. Secured through cryptographic protocols and based on block chain technology, these assets lack intrinsic value as physical commodities like gold do not back them. Additionally, they exist purely in digital form without any tangible representation. Cryptocurrencies offer practical utility and precise traceability. Although intangible, cryptocurrencies are highly transparent due to the Blockchain's immutable nature. Therefore, the transfer of cryptocurrencies is 100% digital-based in nature and conducted between two individuals or organizations through online exchange platforms (Harsono, 2020).

In blockchain based virtual currency systems like Bitcoin, transactions occur directly between users without relying on intermediaries such as banks (Swan, 2015). As a result, these transactions typically incur no fees and do not include the real names of senders. Additionally, there is ongoing interest in whether such digital currencies will become part of the global financial system. Each bitcoin transaction is added to a public ledger called the Blockchain, but it only identifies the parties by numbers known as bitcoin addresses (Rudolf & Morely, 2020). Since its introduction in 2009, Bitcoin has gained significant attention, particularly due to its recent surge in value (Golumbia, 2016). In emerging countries like China, they announced a total of 3547 patents on blockchain technologies in 2019, which is more than in the whole of 2018 and accounts for over half of the world's total (Ekman, 2021).

The 2020 Geography of Cryptocurrency report by Chainalysis highlights that cryptocurrency adoption is most prevalent in regions such as Latin America, Africa, and Asia areas typically characterized by high inflation, volatile currencies, and restricted access to formal banking services (Chainalysis, 2020). Bitcoin, however, is only one of several possible applications that Blockchain enables, and it is important not to conflate the two. The Blockchain is an example of a distributed ledger technology (DLT) in which there is no authoritative account holder or central location for data storage (Ulfstjerne, 2020). In nations like Indonesia, Nigeria, Venezuela, and El Salvador, cryptocurrencies are increasingly utilized as a hedge against currency depreciation, a means of preserving value, and a tool for enabling financial transactions that circumvent the limitations of conventional banking infrastructure. Before Indonesia's digital economy boom, co-regulation was only apparent in the conventional financial sector, particularly in the capital market. This has better prepared the financial sector to participate in co-regulation as the digital economy develops (Audrine & Murwani, 2021).

In countries where over 80% of the population has a financial account such as China, Kenya, India, and Thailand the focus is now shifting from merely providing access to encouraging more active use of a wider array of financial services. Although global savings rose between 2011 and 2021, the disparity between advanced and developing economies grew, with savings rates at 58% and 25%, respectively. Expanding financial services to those who remain excluded or underserved is a key element in promoting inclusive growth and reducing poverty (Demirgüç-Kunt et al., 2018).

Theoretically, cryptocurrency has the potential to directly enhance financial inclusion by providing an alternative for the unbanked. Research by El Amri et al. (2021) highlights explicitly how the integration of crypto with mobile money platforms can directly expand the reach of financial services. However, other studies like El Hajj and Farran (2024) argue that this direct impact is often hindered by factors such as low digital literacy and the lack of supportive infrastructure. Cryptocurrencies provide several mechanisms to enhance inclusion by addressing traditional barriers to accessing financial services, offering innovative solutions for money transfers, savings, and lending activities (Ullah et al., 2022; Setyawan et al., 2024).

Economic empowerment is the ownership of finances, investments, property, and gaining education (Dalal, 2011). The theory of economic empowerment suggests that expanding access to financial services enhances financial inclusion and empowers individuals, particularly those underserved by traditional banks. This includes access to savings, affordable loans, and the ability to conduct transactions. As digital finance gains attention from policymakers and scholars, its role in reducing poverty and driving economic growth becomes increasingly recognized (Ozili, 2023). Theoretically, cryptocurrency adoption offers greater financial autonomy and control to its users due to its decentralized nature. Users can manage their funds without relying on intermediaries like conventional banks. This control and independence are at the core of economic empowerment. Research by El Hajj and Farran (2024) confirms that cryptocurrency adoption significantly enhances economic empowerment in emerging markets. The sense of control over financial decisions and access to new economic opportunities are primary drivers.

Le's (2025) study underscored that cryptocurrencies when integrated with decentralized platforms enhance individual autonomy but require robust onboarding processes to support inclusion. A recent study by Celestin and Vanitha (2021) demonstrates that supportive regulatory environments and technological readiness primarily drive cryptocurrency adoption in the Asia-Pacific region. Their statistical analysis confirms that countries with moderate regulatory openness tend to show significantly higher adoption rates of digital assets. Cryptocurrencies, by lowering transaction costs and accelerating cross-border transfers, support financial inclusion and development in emerging economies. Financial innovations that reduce barriers and expand access to credit, banking, and investment can further strengthen inclusion and growth (Mabrouk et al., 2023). Furthermore, the blockchain technology underlying cryptocurrency offers transparency and transaction security that can enhance trust. Research by Ullah et al. (2022) indicates that the combination of cost efficiency and trust creates a powerful hybrid for driving the adoption of blockchain technology by financial institutions. When users experience this security and transparency, their trust may increase not only in the crypto platform itself but also in the broader digital financial ecosystem.

From the user's perspective, satisfaction is key to the continued use of a technology. According to the UTAUT framework, if users perceive tangible benefits (Performance Expectancy) and Ease of use (Effort Expectancy), their satisfaction will increase. In the crypto context, these benefits include lower transaction costs and faster cross-border transfers. García-Monleón et al. (2023) found that a value-based approach, which includes perceived benefits, is key to understanding cryptocurrency adoption. A positive user experience will directly increase their satisfaction with the platform used. Integrating cryptocurrencies into mobile money platforms can enhance financial inclusion, especially in regions lacking traditional banking infrastructure. Mobile phones are already widely used for everyday financial transactions, and with cryptocurrency integration, users can transfer money internationally and access stronger currencies without needing formal banks. This approach is particularly effective, transparent, and secure where mobile money is prevalent (El Amri et al., 2021; Rieger et al., 2022).

According to Dwivedi et al. (2019), performance expectancy explains the belief users have that a system will help them achieve their objectives. In the context of cryptocurrencies, this primarily relates to users' expectations of financial returns and the security measures provided by the platform. Financial inclusion is not just about having access but also about active participation in the financial system. Individuals who feel economically empowered having control over their finances and plans tend to more actively seek out and use both formal and digital financial services. Research by Mabrouk et al. (2023) shows that digital financial inclusion effectively empowers women economically, which in turn encourages greater economic participation. This reciprocal relationship implies that empowerment is a critical bridge to inclusion. The same conclusion was also highlighted by El Hajj and Farran (2024).

Social influence reflects how strongly users perceive a technology as necessary in their lives, often shaped by the opinions and recommendations of peers and influencers (Dwivedi et al., 2019). This conceptual framework helps analyze the drivers and barriers to cryptocurrency adoption, offering insights into the strategies stakeholders can employ to promote financial inclusion and foster innovation in developing countries. Historically, trust is considered the foundation of any financial system. Low levels of trust in formal financial institutions often act as a barrier to financial inclusion. An increase in trust in institutions (both traditional and digital) will encourage individuals to participate more confidently in the financial system. Cao et al. (2023) argued that digital currencies provide lower-cost alternatives for savings and transfers, particularly when integrated with mobile platforms. However, they also highlighted the importance of regulatory clarity and user trust to avoid financial exclusion. Ozili (2023) also argued that while these technologies improve access, their volatility and lack of investor protection mechanisms may reduce trust in the absence of regulatory safeguards.

Hsiao et al. (2018) explain that effort expectancy describes how easy or difficult a technology is to use, explaining the user-friendly and straightforward nature of the technology to both new and old users. It plays a crucial role in determining

whether a cryptocurrency platform is user-friendly. User satisfaction also plays a vital role. Users who are satisfied with their experience on a financial platform are likely to continue using it and even explore other financial products offered. This satisfaction builds loyalty and long-term engagement, which is a form of deeper financial inclusion. García-Monleón et al. (2023) focused on perceived value as the key driver of cryptocurrency adoption. Their findings show that user satisfaction is determined not only by financial returns but also by platform security, Ease of use, and fee transparency factors that contribute to long-term engagement and inclusion. El Hajj and Farran (2024) find the importance of balanced regulation and public trust; therefore, user satisfaction can enhance financial inclusion.

Therefore, this study aims to investigate how digital financial innovations, with a particular emphasis on cryptocurrencies, can facilitate inclusive financial development in emerging economies, focusing specifically on Indonesia as a case example. The following hypotheses are proposed for this study:

H₁: Cryptocurrency adoption (CA) positively influences financial inclusion (FI).
H₂: Cryptocurrency adoption (CA) positively influences perceived economic empowerment (PEE).
H₃: Cryptocurrency adoption (CA) positively influences trust in financial institutions (TFI).
H₄: Cryptocurrency adoption (CA) positively influences user satisfaction (US).
H₅: Perceived economic empowerment (PEE) positively influences financial inclusion (FI).
H₆: Trust in financial institutions (TFI) positively influences financial inclusion (FI).
H₇: User satisfaction (US) positively influences financial inclusion (FI).

MATERIALS AND METHODS

Research Design and Data Collection

This research investigates how cryptocurrency adoption influences financial inclusion and economic empowerment within developing countries. To ensure the robustness of the findings, a structured survey was designed to evaluate five core constructs: Financial Inclusion (FI), Cryptocurrency Adoption (CA), User Satisfaction (US), Trust in Financial Institutions (TFI), and Perceived Economic Empowerment (PEE). Each construct was measured using validated indicators adapted from prior scholarly works.

Respondents are Indonesians who have invested in cryptocurrencies, especially Bitcoin, and have done so for the past year. The minimum number of respondents is obtained from the number of indicators related to research variables used in the model. In total, there are 25 indicators used, so the minimum number of respondents is 125. This research was conducted using the SmartPLS application, where PLS-SEM works efficiently with small sample sizes when models are complex (Hair et al., 2017; Sarstedt et al., 2021).

Data was collected via Google Forms, ensuring anonymity and confidentiality. A pre-test with 20 participants confirmed the validity of the survey's 25 questions, with five questions per variable. This study adopted a non-probability purposive sampling method, as used by Abbasi et al. (2021). The survey used a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). Participants were recruited through social media, email campaigns, and community partnerships. The final sample included 147 respondents from diverse demographics, including income, age, education, and location. PLS analysis results are based on this sample, with demographics showing that all respondents' ages are in the active stage, most of them have bachelor's degrees (around 75%), high school graduates (24%), and professional workers (1%). 60% of respondents live in Jakarta, the rest live outside Jakarta. The survey model and their indicators are shown in Table 1.

Table 1. Survey Model and Indicators

Survey Model	Indicators
Financial Inclusion (FI)	Access to banking services, use of financial products, and financial literacy
Cryptocurrency Adoption (CA)	Frequency of use, amount invested, duration of use
User Satisfaction (US)	Perceived benefits, Ease of use, Overall satisfaction
Trust in Financial Inclusion (TFI)	Trust in banks, trust in government financial policies, trust in cryptocurrency platforms
Perceive Economic Empowerment (PEE)	Control over financial decisions, ability to save, and economic stability

RESULTS

Research Model Eligibility

The outer loading values for all pointers are over the edge of 0.70, demonstrating that each pointer dependably contributes to measuring its individual build. This fulfills a key prerequisite for focalized legitimacy, where high factor loadings affirm that the observed factors share adequate change with their unobserved factors. Since each pointer unequivocally relates to the development, it is expected that, to a degree, the estimation demonstrates a satisfactory level of concurrent legitimacy. Hence, the pointers utilized can be measurably substantial and fitting to encourage investigation at the auxiliary show organization.

Table 2. Reliability and Validity Test

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CA	0.954	0.954	0.965	0.845
FI	0.89	0.894	0.919	0.695
PEE	0.893	0.895	0.921	0.701
TFI	0.806	0.851	0.884	0.72
US	0.89	0.899	0.919	0.696

Source: Author's Data Processing (2025)

Based on the reliability and validity test results shown in Table 2, all constructs in the model meet the measurement feasibility criteria. The Composite Reliability value is above 0.70 and Cronbach's Alpha is above 0.60 for all constructs, which indicates that the indicators used have excellent internal consistency. In addition, the Average Variance Extracted (AVE) value of all constructs also exceeds the 0.50 threshold, which indicates that their respective latent constructs can explain more than 50% of the indicator variance. Thus, both reliability and convergent validity in this model can be declared adequate and valid.

Table 3. Cross Loading Test

	CA	FI	PEE	TFI	US
CA1	0.908	0.46	0.783	0.696	0.82
CA2	0.951	0.499	0.745	0.676	0.811
CA3	0.946	0.534	0.798	0.66	0.827
CA4	0.907	0.648	0.745	0.718	0.805
CA5	0.881	0.758	0.831	0.613	0.814
FI1	0.464	0.819	0.601	0.333	0.51
FI2	0.458	0.862	0.561	0.306	0.534
FI3	0.492	0.853	0.577	0.348	0.506
FI4	0.606	0.823	0.594	0.424	0.648
FI5	0.6	0.81	0.743	0.449	0.62
PEE1	0.765	0.649	0.881	0.625	0.767
PEE2	0.707	0.647	0.853	0.493	0.684
PEE3	0.659	0.707	0.817	0.427	0.672
PEE4	0.623	0.61	0.778	0.656	0.672
PEE5	0.801	0.511	0.854	0.565	0.775
TFI1	0.455	0.264	0.446	0.727	0.467
TFI4	0.628	0.421	0.589	0.917	0.681
TFI5	0.736	0.436	0.618	0.889	0.709
US1	0.818	0.638	0.825	0.611	0.895
US2	0.67	0.37	0.662	0.509	0.749
US3	0.729	0.524	0.659	0.665	0.833
US4	0.691	0.653	0.66	0.595	0.827
US5	0.785	0.618	0.743	0.715	0.859

Source: Author's Data Processing (2025)

The cross-loading results in Table 3 demonstrate that each indicator loads highest on the construct it is intended to measure when compared to its loading on other constructs. This pattern confirms that each indicator is aligned with its respective latent variable, thereby providing evidence of proper construct representation. Furthermore, the observed differences or gaps between the loading values on the intended construct versus other constructs highlight the distinctiveness of each construct. This separation reinforces the presence of a clear discriminant structure within the measurement model, which is essential for ensuring that constructs are not empirically overlapping.

Based on these findings, the discriminant validity within the model has been adequately fulfilled. Consequently, the measurement instruments utilized are valid and appropriate, making them suitable for application in the next stage of analysis, namely the structural model evaluation.

Table 4. Fornell-Larcker

	CA	FI	PEE	TFI	US
CA	0.919				
FI	0.635	0.833			
PEE	0.851	0.747	0.837		
TFI	0.732	0.452	0.658	0.848	
US	0.888	0.682	0.853	0.745	0.834

Source: Author's Data Processing (2025)

The results of the analysis in Table 4 show that the square root value of the AVE for each construct (diagonal value) is greater than the correlation value between other constructs (off-diagonal value). This finding indicates that each construct in the model is stronger in explaining its indicator variable than other constructs, which means that discriminant validity has been achieved. Therefore, the measurement model is declared to have good validity and is suitable to proceed to the next stage of structural analysis.

Table 5. Heterotrait-Monotrait Ratio (HTMT) Value

	CA	FI	PEE	TFI	US
CA					
FI	0.678				
PEE	0.919	0.828			
TFI	0.816	0.513	0.769		
US	0.962	0.749	0.956	0.86	

Source: Author's Data Processing (2025)

Based on Table 5, all HTMT coefficient values are below the maximum threshold of 0.90, which is commonly used to assess discriminant validity. This indicates that each construct in the model does not have excessive correlation with the others, and can represent different concepts. Thus, it can be concluded that discriminant validity has been met, and the data used are valid to proceed to the structural analysis stage.

Descriptive Statistics
The following section provides summary statistics for the key variables analyzed in this study, offering insight into their central tendencies and dispersion.

Table 6. Descriptive Statistics for Cryptocurrency Adoption (CA).

Indicators	Mean	Standard Deviation (SD)
CA1	5.17	1.151
CA2	4.973	1.24
CA3	4.952	1.362
CA4	5.034	1.253
CA5	5.17	1.139

Source: Author's Data Processing (2025)

Cryptocurrency Adoption represents the extent to which respondents incorporate digital assets into their financial activities. Based on Table 6, the highest average scores (5.17) are for CA1 ("I feel comfortable using cryptocurrencies to invest") and CA5 ("I believe cryptocurrency will help me achieve financial independence or wealth"). The lowest score (4.952) appears in CA3 ("I feel comfortable investing most of my financial assets in cryptocurrencies"). These results indicate a moderate to high level of adoption, with low variation across respondents, suggesting broad exposure to cryptocurrency in terms of understanding, usage, and transaction frequency. In the structural model, Cryptocurrency Adoption serves as a key construct, driving both economic empowerment and financial inclusion.

Table 7. Descriptive Statistics for Perceived Economic Empowerment (PEE)

Indicators	Mean	Standard Deviation (SD)
PEE1	5.116	0.958
PEE2	5.061	1.114
PEE3	5.095	1.139
PEE4	4.966	1.198
PEE5	5.129	1.102

Source: Author's Data Processing (2025)

Perceived Economic Empowerment measures an individual's perception of increased economic independence through cryptocurrency adoption; it can be enhanced through community development and empowerment initiatives aimed at poverty reduction. These efforts often involve promoting creativity and innovation that align with the community's unique potential and needs. The implementation of various programs demonstrates the government's strong commitment to addressing these issues and advancing economic empowerment at the community level (Subiyakto et al., 2022). Based on Table 7, the maximum indicator average values of 5.129 are on the indicator PEE5 (Do you believe that cryptocurrencies have provided you with more economic opportunities than the traditional financial system?). On the other hand, the indicator with the lowest average value of 4.966 is indicator PEE4 (I have a financial plan or backup to deal with unexpected expenses in the future). The level of perceived economic empowerment is moderate to high, with low variation between respondents.

Table 8. Descriptive Statistics for Trust in Financial Institutions (TFI).

Indicators	Mean	Standard Deviation (SD)
TFI1	4.354	1.287
TFI4	4.959	1.009
TFI5	4.714	1.172

Source: Author's Data Processing (2025)

Trust in Financial Institutions represents the respondents' level of trust in traditional financial institutions, especially after using Blockchain or cryptocurrency-based services. Trust in a financial institution becomes a key in the decision-making process. Based on Table 8, the maximum indicator average value of 4.959 is on the indicator TFI4 (I believe that the financial institution I use conveys information honestly to customers). On the other hand, the indicator with the lowest average value of 4.354 is indicator TFI1 (Government regulations on financial institutions ensure fairness and transparency in the financial system). The level of trust in financial institutions is moderate, with low variation between respondents. This finding is important as it suggests that trust in financial institutions is still being built gradually and is influenced by respondents' digital experience.

Table 9. Descriptive Statistics for User Satisfaction (US)

Indicators	Mean	Standard Deviation (SD)
US1	5.265	0.891
US2	5.272	0.9
US3	4.857	1.267
US4	4.558	1.4
US5	5.177	1.067

Source: Author's Data Processing (2025)

User Satisfaction reflects the level of user satisfaction with their experience using the cryptocurrency platform. Based on Table 9, the maximum indicator average values of 5.272 are on the indicator US2 (I am satisfied with the security systems provided by the cryptocurrency platforms I use). On the other hand, the indicator with the lowest average value of 4.558 is indicator US4 (I am satisfied with the fees charged when using cryptocurrencies). The level of user satisfaction is moderate to high, with low variation between respondents. This reflects that while most respondents are satisfied, there is a group that may have a less satisfactory experience.

Table 10. Descriptive Statistics for Financial Inclusion (FI)

Indicators	Mean	Standard Deviation (SD)
FI1	5.19	1.058
FI2	5.054	1.177
FI3	5.034	0.907
FI4	4.986	1.155
FI5	4.912	0.975

Source: Author's Data Processing (2025)

Financial Inclusion represents the degree to which individuals participate in the formal financial system, encompassing access to banking services, utilization of financial products, and financial literacy. In analyzing users' choices to adopt cryptocurrency, perceived value serves as a valuable framework for predicting technology usage intentions, with technology adoption theories aiding in identifying key value drivers (García-Monleón et al., 2023). As shown in Table 10, the highest mean score (5.19) is associated with FI1 ("I have easy access to digital banking services"). At the same time, the lowest (4.912) corresponds to FI5 ("I understand basic financial concepts such as interest rates, budgeting, and investment options"). These findings reflect a generally moderate to high level of financial inclusion among participants, with relatively slight variation.

DISCUSSIONS

The adoption of cryptocurrencies and their growing utilization, particularly in developing nations, offer significant advantages in advancing financial inclusion and fostering economic empowerment. This study's findings suggest that cryptocurrencies serve as viable alternatives to conventional banking services, especially in regions with limited or no banking infrastructure. Digital currencies can support financial inclusion by enabling faster transactions, reducing transaction costs, and providing secure options for saving and investing.

Table 11. Hypothesis testing

Hypothesis	Path Coefficients	p-Value	Result
H1: Cryptocurrency adoption (CA) positively influences financial inclusion (FI).	0.635	0***	significant
H2: Cryptocurrency adoption (CA) positively influences perceived economic empowerment (PEE).	0.851	0***	significant
H3: Cryptocurrency adoption (CA) positively influences trust in financial institutions (TFI).	0.732	0***	significant
H4: Cryptocurrency adoption (CA) positively influences user satisfaction (US).	0.888	0***	significant
H5: Perceived economic empowerment (PEE) positively influences financial inclusion (FI).	0.654	0***	significant
H6: Trust in financial institutions (TFI) positively influences financial inclusion (FI).	-0.143	0.151	not significant
H7: User satisfaction (US) positively influences financial inclusion (FI).	0.318	0.049**	significant

Note: *, **, *** significance in alpha 10%, 5%, 1% (respectively)
Source: author's data processing (2025)

Results from the hypothesis testing in Table 11 suggest that Cryptocurrency Adoption (CA) has a significantly positive effect on Financial Inclusion (FI), Perceived Economic Empowerment (PEE), and Trust in Financial Institutions (TFI). Whereas, CA has the most significant influence on the User Satisfaction (US). This substantial impact on User Satisfaction provides robust support for the Unified Theory of Acceptance and Use of Technology (UTAUT), which posits that perceived Ease of Use and performance expectancy are core predictors of technology adoption. This finding is in line with the study conducted by El Hajj and Farran 2024), which demonstrates that cryptocurrency adoption significantly contributes to user satisfaction, trust in financial systems, and economic empowerment in Indonesia. The authors argue that these effects are primarily driven by the decentralized nature of cryptocurrencies, which offer users greater control, reduced transaction costs, and access to financial tools without reliance on traditional banks. Furthermore, CA's limited impact on

FI may reflect the reality that although crypto provides access to financial services, institutional, regulatory, and literacy barriers still hinder full inclusion. Although cryptocurrencies enhance financial autonomy and trust, actual inclusion in formal financial systems requires supportive infrastructure and digital literacy, particularly in emerging economies.

The results show that Financial Inclusion (FI) is not directly influenced by Cryptocurrency Adoption (CA), but is positively impacted by User Satisfaction (US) and, most strongly, by Perceived Economic Empowerment (PEE). This aligns with El Hajj and Farran (2024), who argue that the sense of control and empowerment derived from using decentralized financial tools motivates users to participate more actively in financial systems. This reinforces the core argument of this study: the pathway to financial inclusion in Indonesia via cryptocurrency is indirect. As El Hajj and Farran (2024) and Mabrouk et al. (2023) note, it is not merely about access to digital platforms, but the psychological and experiential outcomes such as perceived empowerment and user satisfaction that significantly influence financial behavior and inclusion outcomes.

Table 12. Indirect Effect Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
CA -> PEE -> FI	0.556	0.547	0.086	6.44	0***
CA -> TFI -> FI	-0.105	-0.099	0.072	1.457	0.145
CA -> US -> FI	0.282	0.293	0.143	1.969	0.049**

Note: *, **, *** significance in alpha 10%, 5%, 1% (respectively)
Source: author's data processing (2025)

The Indirect Effect Test results in Table 12 show that cryptocurrency adoption has a significant indirect effect on financial inclusion through the mediation of perceived economic empowerment and user satisfaction. This finding indicates that when individuals feel more economically empowered as a result of using digital currencies, they are more likely to engage in the formal financial system actively. In addition, user satisfaction with the cryptocurrency platform also plays an important role in driving financial engagement, reflecting that positive experiences in using digital technologies can increase interest and trust in financial services. In contrast, the pathway involving trust in financial institutions did not show a significant effect and is therefore not the focus of further discussion.

The results align with recent empirical findings from El Hajj and Farran (2024), which revealed that while perceived economic empowerment and user satisfaction significantly mediate the relationship between cryptocurrency adoption and financial inclusion, trust in financial institutions does not exhibit a meaningful mediating role. Similar observations were made by García-Monleón et al. (2023), who emphasized user satisfaction as a crucial driver of sustained crypto engagement, and by Mabrouk et al. (2023), who highlighted empowerment as a pivotal pathway for financial inclusion.

The results show that cryptocurrency adoption can positively influence financial inclusion if supported by perceived economic empowerment, which explains that the effectiveness of digital financial innovations in promoting inclusion depends largely on individuals' sense of economic agency and control, particularly in emerging economies. This finding also highlights the importance of user trust and satisfaction, which could be a concern in policies or strategies to strengthen trust in financial institutions. Overall, the data suggest a meaningful and valid mediation relationship in the context of this model.

However, this study also presents nuanced findings that diverge from existing literature. An exciting result is that Trust in Financial Institutions (TFI) does not function as a significant mediator between CA and FI. This stands in contrast to literature such as Abbasi et al. (2021), which emphasizes the crucial role of investor trust in driving the intention to adopt cryptocurrencies. This divergence may indicate that within the Indonesian context, the tangible benefits of personal economic empowerment and a positive user experience are more potent drivers of financial engagement than trust in formal institutions alone. This suggests that greater adoption of cryptocurrency is associated with improved access to financial services in Indonesia, which potentially addresses barriers faced by unbanked populations.

CONCLUSIONS

This study finds that cryptocurrency adoption (CA) significantly and positively influences Perceived Economic Empowerment (PEE), Trust in Financial Institutions (TFI), and User Satisfaction (US), with the most potent effect on US. Users view crypto platforms as secure, user-friendly, and valuable supported by high indicator means. CA also boosts economic empowerment, showing users' increased confidence in managing finances and pursuing opportunities. These results support El Hajj and Farran (2024), highlighting crypto's role in advancing financial autonomy in developing regions.

While cryptocurrency adoption (mean = 5.06) boosts trust in financial institutions especially digital ones this trust does not significantly drive financial inclusion. Instead, user satisfaction (mean = 5.03) and economic empowerment (mean = 5.07) are the main contributors. High average scores on inclusion indicators (mean = 5.04) reflect strong engagement with digital banking among empowered, satisfied users. These findings suggest that improving access alone is not enough; financial inclusion also depends on enhancing user experience and promoting empowerment within a supportive ecosystem.

This underscores the crucial role of economic empowerment as a mediator, where empowered individuals are more likely to leverage crypto tools to access broader financial services. These results support the idea that individuals' sense of economic agency plays a pivotal role in converting crypto usage into actual financial engagement. Moreover, user satisfaction serves as a reliable indirect path, meaning that user-centered product development, clear communication,

affordable transaction fees, and strong security can increase satisfaction and thus, indirectly, financial inclusion. Platforms that invest in improving the user journey can therefore become effective agents for inclusive finance.

The adoption of cryptocurrency instruments is very beneficial, especially in developing countries. Users appreciate cryptocurrencies as they can control their funds without intermediaries (Banks). Users who can manage their funds are an important milestone in the advancement of Perceived Economic Value in developing countries. This autonomy is important, particularly in regions where the conventional banking sector is either unavailable or lacks credibility. Cryptocurrencies gain more strength in the regions with better mobile technology adoption (El Amri et al., 2021). It is established that cryptocurrency enables better access to financial products and services and empowers users financially. The findings indicate that cryptocurrencies help in availing financial services for underbanked and also previously unbanked individuals.

Implications for investors and regulators are multifold. For investors, the data suggests that high user satisfaction and economic empowerment are critical value drivers in the crypto space offering opportunities in platforms that prioritize accessibility, security, and transparency. For regulators, the challenge lies in ensuring that volatility, scams, or misinformation do not undermine the empowering effects of cryptocurrency. Regulation should thus aim not to restrict innovation, but to reinforce digital financial literacy, protect users, and build a trustworthy ecosystem that supports long-term financial inclusion goals.

This study has several limitations. First, the small sample size limits the generalizability of the results; a larger sample could increase statistical power and reduce bias. Second, participants were only from major cities in Indonesia, so the findings may not reflect those in rural areas, smaller towns, or other countries. Future research should include a larger, more diverse sample across different regions and socioeconomic backgrounds. Longitudinal studies or mixed methods, such as combining surveys with interviews, could also provide deeper insights.

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