



Modelling Cryptocurrency Usage Intention: The Effects of TAM, Risk, and Online Interaction

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Abstract

The determinants that affect the adoption of block chain based cryptocurrencies among the developing economies are the primary area of focus in this research paper, with usability and usefulness, perceived risk, online social and commercial interaction as the mediating variables. The application of a quantitative method using structural equation modelling (SEM) was used to test an explanatory framework of the cryptocurrency adoption. The data collection was done via a structured online survey in relation to cryptocurrency users in Jordan, a developing economy that is undergoing the process of digital financial transformation. The influence of usability, usefulness, and risk perception was identified, and their mediating role on online social and commercial interactions on the adoption of cryptocurrency was established. The findings indicate that the perceived usability and usefulness have a positive correlation with the cryptocurrency adoption, whereas perceived risk is depicted to have a multifaceted correlation with adoption tendencies. Online social interactions mediate usability and adoption in a very significant way, online social interactions define trust and engagement of users. On the same note, adoption is facilitated through such online commercial interactions as they create a sense of utility and remove risk issues. The study is an extension of the Technology Acceptance Model (TAM) in the sense that it adds online social and commercial interactions as mediators, which provides a more thorough conceptual frame to the process of cryptocurrency adoption in developing economies. Moreover, this research paper proposed to build trust in digital financial ecosystems, the policymakers, financial institutions, and cryptocurrency platforms should come up with measures to increase usability, reduce risks, and interact with stakeholders.

Keywords: Block Chain-Based Cryptocurrencies, Cryptocurrency Technology, Technology Acceptance Model, Online Social Interaction, Online Commercial Interaction

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1-Introduction:

Block-chain technology was formalized in Satoshi Nakamoto's 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2008b) to the Bitcoin MIT4th edition specified in Nakamoto (2008b). This revolutionary innovation was a decentralized peer-to-peer financial system without intermediaries; like financial institutions (Abdulhakeem & Hu, 2021). Transactions blocks containing data about personal identification, tokens, assets, or digital currencies are securely linked across a decentralized network, which is known as block-chain (Abdulhakeem & Hu, 2021; Gao et al., 2018; Yuan & Wang, 2018). The most prominent block-chain applications are cryptocurrencies that can be used as digital currencies for making transactions out of conventional financial regulations (Girasa, 2018; Skaf, 2023). The number of cryptocurrencies currently exceeds 11,341 of which 3575 have a market capitalization greater than \$ 1 million, and this represents an alternative financial system cryptocurrency such as Bitcoin, Ethereum, Ripple, and Cardano are valued at more than USD 223.24 billion (World Coin Index, 2024; World Bank Indicator, 2021). On the one hand, cryptocurrencies offer new opportunities, while on the other hand, they are still characterized by risks and challenges that include financial crimes, lack of regulations, and social and cultural commitment to digital currency (Arnone, 2024; Chithaluru et al., 2020; Silva & Maciel, 2025). However, while cryptocurrency adoption holds the promise of having benefits like efficiency, traceability, and security, its adoption also has its risks thus bringing into question whether it could be accepted, especially in developing economies. However, the reality is different in developing economies where they have to confront additional issues of less financial literacy and sophistication, technological ability, and uncertainties in the regulatory environment (Shoetan &

Familoni, 2024). Although many studies have been conducted on the adoption of block chain-based cryptocurrencies but they focus on developed markets without considering distinct socio-economic and technological conditions of developing economies (Akhtar et al., 2021; Alazab et al., 2021; Gautam et al., 2025). While this research paper investigates the usability and usefulness, perceived risks, and the influence of online social and commercial interactions in cryptocurrency trading in developing economies. This research paper specifically targets the factors influencing cryptocurrency adoption in Jordan, a country where internet and mobile banking as digital financial services is growing, but cryptocurrency adoption is not (Karim, 2019; Yaseen et al., 2022). In particular, this research extends TAM by developing and analyzing the relative contribution of the perceived ease of use, perceived benefits and perceived risks in addressing the limitations of the model (Ajibade, 2018; Tam et al., 2019). This research not only determines perceived advantages and perceived usability but can be affected by security, regulation and trust concerns as well. The overall effect of such a large number of variables on adoption in emerging financial markets is better captured by this approach. Furthermore, the research paper also highlights that online social and commercial interrelations giving rise to the influence of digital networks on financial behavior (Dey et al., 2020).

To address these objectives this research paper raises the following research questions:

RQ₁ What are the key factors influencing the adoption and usage of cryptocurrencies in developing economies?

RQ₂ How do perceived ease of use, perceived benefits, and perceived risks shape cryptocurrency adoption decisions?

RQ₃ What role do online social interactions and online commercial interactions play in mediating cryptocurrency adoption?

RQ₄ What practical strategies can be implemented to enhance cryptocurrency adoption in developing economies?

The contribution of this research paper is of theoretical significance as it extends the Technology Acceptance Model (TAM) by integrating online social and commercial interaction as mediating variables. While other research which predominantly concentrates on experienced economies, this research presents a nuanced understanding of the adoption of the cryptocurrency in developing socio-economic and regulatory and technological characteristics bounds. Secondly, it contributes to the digital finance literature by showing how social and commercial interactions affect the way perceived usability and perceived usefulness and perceived risk are involved in shaping an adoption behavior (Faqih, 2020). Finally, this research provides empirical evidence to promote adoption and, instead, interacts with other well-known behavioral finance and innovation diffusion theories (De Grauwe & Grimaldi, 2018; Fama, 1998).

In terms of practical impact, this research paper offers guidelines to cryptocurrency issuers, financial institutions, and policy makers. Regulatory bodies should first set clear and supportive legal frameworks that reduce uncertainty and improve trust for adopting cryptocurrency (Lee & L'heureux, 2020). The second measure that should be taken to make block chain based financial solutions more usable and less risky is to provide users with financial based literacy programs hence increasing their understanding of block chain based financial solutions (Chang et al., 2020). Third, cryptocurrency platform should design the user interface better and the transaction security for better usability and accessibility (Albayati et al., 2021). Finally, online social and commercial engagement strategies such as, influencer marketing and peer to peer finance education, can go one step further in adopting cryptocurrency by

increasing consumer trust as well as the belief from consumers that risks have been eliminated (Basnet, 2024; Krause, 2025).

However, this research has a few limitations which future research might be able to resolve. The research has a cross-sectional nature that captures adoption behavior at a single point in time; therefore, a longitudinal study can follow overtime changes in adoption. In addition, this research takes Jordan as a representative of developing economy, and it is needed to examine these findings in developing regions with different economic, cultural, and regulatory environments. Another limitation is based on using survey based data which can introduce bias (Chen et al., 2023), such as social desirability bias (Larson, 2019), and future researcher could conduct studies based on transaction records or experimental research. Furthermore, other factors such as concern for cybersecurity, governmental regulation, and institutional trust are additional factors that must be included in future models so that cryptocurrency adoption dynamics can be better understood (Etemadi et al., 2021; Shahzad et al., 2024).

The rest of this paper is structured in the way outlined below: Section 2 provides literature review and theoretical framework. The research methodology of section 3 includes data sources and analytical techniques. The empirical results and findings are provided in section 4. The results are discussed in Section 5. Finally, section 6 concludes the research with a highlight of key findings, limitations, and possible directions for future research.

2-Theoretical background:

The research design the paper presents is aimed at answering the research question posed by the scholars who are interested in the individual reactions towards the adoption of information technology. Secondly, it is constructed using several theoretical foundations such as the Technology Acceptance Model (TAM)

(Natasia et al., 2022), the Theory of Reasoned Action (TRA) (Ajzen and Kruglanski, 2019), the Theory of Planned Behavior (TPB) (Conner, 2020) and the Diffusion of Innovations Theory (IDT) (Conner, 2020). Integrating these theories, a holistic model has been created, which allows the researcher to gain a deeper insight into how the process of technology adoption takes place, which is the technology adoption that deals with cryptocurrency. All the models are founded on the same premise: they propose how individuals would utilize the technological advances depending on the factors that influence acceptance, usage, and further usage. The integration of these theories was confirmed since they are complementary to explain the adoption of cryptocurrencies in terms of user acceptance through the attainment of a multifaceted explanation of user acceptance. Whereas TAM pays closer attention to perceived usefulness and ease of use in order to determine the intention of a person to use technology (Chen and Tsai, 2019), TRA primarily reveals the effects of attitudes and subjective norms in the formation of the decision (Kashif et al., 2018).

In the same vein, TPB also builds upon TRA with the added difference of considering the perceived behavioral control within the scope of identifying the possible regulating factors that limit the decision-making process (Lung-Guang, 2019). Concurrently, IDT focuses on the attributes of innovation, such as relative advantages, compatibility, and complexity, which have an effect on the adoption rate (Gledson, 2022). These models are cognitive, social, and environmental factors which promote the gap between the intention and the actual disposition; they consider the personal attitudes and external factors. In addition, they integrate various theoretical constructs that explain various aspects of the adoption of technology in order to enhance predictive accuracy. The study combines these frameworks to give the general framework of cryptocurrency adoptions. TAM

introduces a cognitive assessment of the usefulness of cryptocurrency, TRA and TPB explain the impact of social norms and perceived control, and IDT is a more general view on the relationship between the characteristics of the innovations and their patterns of adoption. On this basis, these models give a sound foundation to the identification of psychological, social, and technological attributes that influence behavior in terms of adoption of cryptocurrency.

3.Hypothesis Development:

A concept of usability is an easy way a user believes that it would be to use a system without making an effort (Jordan, 2020; Tractinsky, 2018). Researchers talked about the perceived simplicity of the use of a method is the extent to which one believes that there would be no costs in using the method (Jun et al., 2018). The perceived ease of use concept means how one thinks it is to comprehend, learn, or use innovation (Caffaro et al., 2020). Further, it has been stated that perceived ease of use is viewed as how consumers perceive a product or a service relative to alternatives (Moslehpour et al., 2018) also indicated perceived ease of understanding or of using an innovation as ease of use.

3.1 Perceived Usability and Perceived Usefulness

The concept of usability is defined as the perception of ease on the side of an individual that it is easy to operate a system without any strain (Lewis, 2018). Despite the fact that researchers have argued whether or not a person perceives the simplicity of a method in relation to the degree of incurred extra costs (Djanar et al., 2024; Jun et al., 2018), both variants of TIC give identical assumptions concerning the reason of simplicity. Ease of use is understood to the extent to which a person can comprehend, study, or use an innovation (Caffaro et al., 2020). Utilizability was specified to the extent to which an individual believed that a particular system would support the performance at work (Tubaishat, 2018). Yuen et al., (2018) identified

relative advantage in a similar way that it is the degree to which an innovation is viewed as superior to a replaced idea (Yuen et al., 2018). The perceived usefulness would presuppose the advantages that a particular technology will create in a person.

These studies are then looking at the effect of perceived usability and perceived usefulness in online financial technology adoption. Wilson (2019) confirms that perceived usability and usefulness have a positive influence on e-commerce adoption (Wilson, 2019). Sujatha & Karthikeyan (2006) asserts that perceived benefits influence the intention of using e-commerce in turn, via its own direct and indirect effect (Tzavlopoulos et al., 2019). As shown by Grover et al., (2019), which analyzed the reasons that lead people to use blockchain-based cryptocurrencies, perceived ease of use and perceived benefits have a great impact on adoption (Grover et al., 2019). The same is found by Nuryyev et al., (2018), between perceived usefulness as an important determinant of cryptocurrency payment adoption (Nuryyev et al., 2018). Anser et al., (2020), assert that perceived behavioral control plays a crucial role regarding cryptocurrency use (Anser et al., 2020).

This research paper formulates the following hypotheses regarding the key factors that shape the adoption of cryptocurrency and the role of online social and commercial interaction as a mediation process.

H₁: *Perceived Usability has a positive influence on the intention to use cryptocurrency.*

H₂: *Perceived Usefulness has a positive influence on the intention to use cryptocurrency.*

H₃: *Perceived Risk has a positive influence on the intention to use cryptocurrency.*

3.2 Online Social Interaction:

The social engagement affects the technology adoption (Lee et al., 2019). There is community interaction through online social platforms that helps in shaping the perceptions and adoption of behaviors (Tsoy et al., 2021). By ease of information exchange on social networks, the uncertainty decreases and perceived risk (Hansen et al., 2018). There are several studies on how online social interactions can influence technology adoption (Beldad & Hegner, 2018; Lee et al., 2019). They determined that this is also true for E-WOM (electronic word of mouth) and purchase intentions. Nuseir (2019) shows that social interactions affect perceived usefulness and ease of use and in effect, e-commerce adoption (Nuseir, 2019). Hansen et al., (2018), state that social media exposure lessens perceived risk (Hansen et al., 2018).

Although little research exists in the literature regarding the role of online social interaction in mediating cryptocurrency adoption, findings from previous studies support the role of mediating offering between key variables of cryptocurrency adoption and user intention. Thus, the following hypotheses are made in the research:

H₄: *Online social interaction significantly mediates the relationship between perceived usability and the intention to use cryptocurrency.*

H₅: *Online social interaction significantly mediates the relationship between perceived usefulness and the intention to use cryptocurrency.*

H₆: *Online social interaction significantly mediates the relationship between perceived risk and the intention to use cryptocurrency.*

3.3 Online Commercial Interaction:

Online commercial engagement refers to participation in business transactions via digital platforms such as websites and mobile applications (Busalim & Ghabban,

2021) argued that consumer purchase decisions are affected by their perception of the products and services. According to Bag et al., (2022), interactive marketing activities improve user engagement resulting in a transaction (Bag et al., 2022). Technology adoption is indeed supported by the empirical studies for online commercial engagement. Interaction richness was found to ensure positive consumer attitudes and behavioral intentions in e-commerce by (Friedrich et al., 2019). According to Baki et al., (2018), online commercial interactions determine the level to which the perceived usefulness and ease of use influence the adoption intention and the price and user behavior in Bitcoin consumption in e-commerce (Baki et al., 2018).

Based on these insights, the research develops the following hypotheses:

H₇: *Online commercial interaction significantly mediates the relationship between perceived usability and the intention to use cryptocurrency in online trading.*

H₈: *Online commercial interaction significantly mediates the relationship between perceived usefulness and the intention to use cryptocurrency in online trading.*

H₉: *Online commercial interaction significantly mediates the relationship between perceived risk and the intention to use cryptocurrency in online trading.*

Figure-1 illustrates *the research framework*:

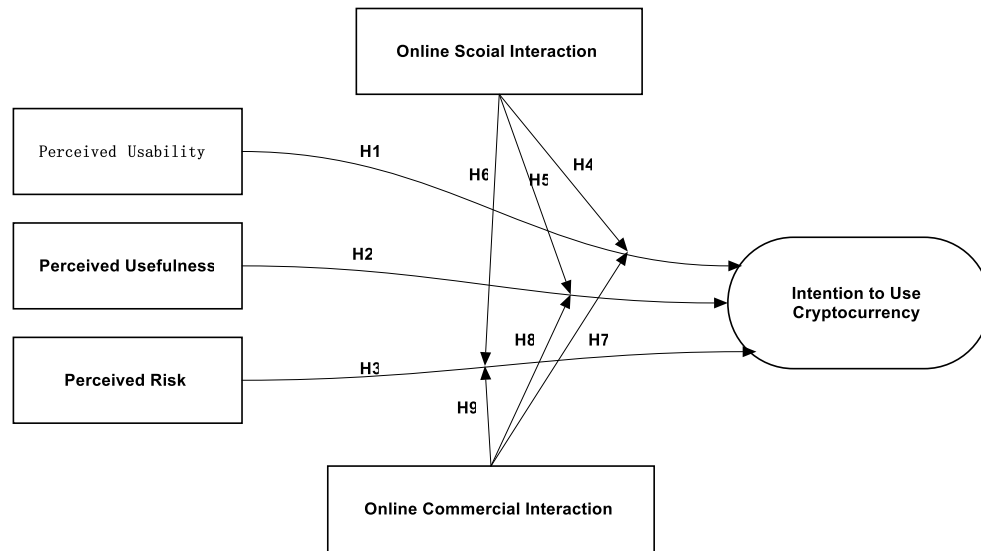


Figure 1 Research Framework

4-Research Methodology:

This study intends to examine the cryptocurrency technology which is based on block chains. In order to do this, an in-depth review of available literature in areas was done. A conceptual framework was drawn as indicated in Figure 1. After that, quantitative data analysis was conducted to evaluate the proposed research framework. The section starts by giving a summary of the data collection technique and then continues with a description of the respondents. This is then followed by assessment of the credibility of the models of measurements. After the measurement model has been found satisfactory, then the structural model is tested to test a hypothesis.

4.1 Data Collection:

This research intends to explore the significant features that impose the acceptance of cryptocurrency online trading technology, with specific reference to how users' choices are guided by perceptions of ease of use, usefulness, and risk. Furthermore, online social interaction and online commercial interaction are explored as mediating factors of the research. Specifically, the research is aimed at developing countries, while Jordan is acting as an example of such nations that have a growing digital space, early adoption of crypto technology, and low barriers to entry. The context of Jordan is a developing economy where technological innovation especially of online financial services is also evolving rapidly (Anagreh et al., 2024). Consequently, the significance of the determinants affecting cryptocurrency trading in Jordan provides potential value to other developing markets (Almajali et al., 2022). The collection of the data was done through a designed online questionnaire involving participants over 18 years old living in Jordan. As the survey was conducted online, the participants had to have internet literacy and thus the sample was limited to internet users. It made use of a practical sampling method via social media platforms for participant recruitment. This approach was selected because it has wide reach as well as the ability to explore via an efficient method of contacting a broad range of respondents across the country. Yet it is worth taking note that this approach could bring with it a bias to people who are more active on the web, and specifically, particularly interested digital citizens.

The research invited a total of 15,000 people to participate, and of those, 4,686 people completed the study for a response rate of 31.24%. This is an adequate response rate; however, the research's findings would certainly be affected by the non-response bias. Key characteristics of the respondents may differ from the no

respondents, thus biasing the results concerning the generalizability of findings. The broad access to online recruitment through social media platforms may however not reflect all social groups including older adults and people who are not highly internet smart. These biases in our approach could be eliminated by future research that uses a combination of online and offline data collection to increase the representativeness of the sample and to reduce potential nonresponse bias.

Ethics of the research were observed and the assumption of participant's informed consent given

the completion of the questionnaire. Hypothesis testing was run using Smart PLs, and the data

were collected from August 1st to September 15th of 2025. The research key factors' measurements were developed from a set of previous studies as seen in *Table 1*.

Table 1: Key factors’ measurements

Key factors	Measurements
Perceived Usability	(Schaupp & Festa,2018; Shahzad <i>et al.</i> , 2024)
Perceived Usefulness	(Al-Haraizah, 2011; Arias-Oliva <i>et al.</i> , 2019)
Perceived Risk	(Mendoza-Tello <i>et al.</i> , 2018).
Online Social Interaction	(Thao & Hoa, 2018; Al-Haraizah, 2016)
Online Commercial Interaction	(Schiffman & Kanuk, 2014; Petit <i>et al.</i> , 2019)
Intention to Use Cryptocurrency	(Polasik <i>et al.</i> , 2015; Mendoza-Tello <i>et al.</i> , 2018)

4.2. Respondents Profiles:

The research conducted an examination of demographics to assess how well the research sample represented the research population. *Table 2* provides an overview of the participants’ traits.

Table 2: Participants' Traits

Category	Frequency	Percentage (%)
Gender		
• Male	2603	55.5
• Female	2083	44.5
Age		
• 18- 25 year	1766	37.7
• 26-35	956	20.4
• 36-45	1108	23.6
• 46 -55	713	15.2
• Over 56 years	143	3.1
Education level		
• High School	254	5.4
• Professional Diploma	636	13.6
• Bachelor's	2449	52.2
• Master	669	14.3
• Ph.D.	678	14.5
Frequency of Internet Usage		
• Every day	3987	85.1
• Once every week	184	3.9
• Once every month	244	5.2
• Once every 2-3 days	271	5.8
Level of Cryptocurrency Knowledge		
• Beginner	202	4.31
• Knowledgeable	3230	68.93
• Expert	792	16.90
• No knowledge	462	9.86

4.3. Reliability:

The study employed Cronbachs alpha reliability analysis to guarantee uniformity of the (questions) that portray all aspects and dimensions of the research variables. The alpha level of greater than 0.70 is considered to be tolerable in the sphere of administrative sciences (Amirrudin et al., 2021). To test the reliability of the questionnaires with the help of Alpha-Cronbach coefficient, 4686 questionnaires were distributed to the participants. The findings of the research are in Table 3 of the Cronbach alpha coefficient of the measurement scales of the scales used. All the scales possess alpha coefficients ranging between 0.72 and 0.904, which means that the coefficients are higher than the recommended value (Bujang et al., 2018).

Table 3: Cronbach's Alpha of the measurement scales

Variable	Cronbach's alpha	Result
Perceived Usability	0.82	Very good
Perceived Usefulness	0.72	Acceptable
Perceived Risk	0.78	Acceptable
Online Social Interaction	0.88	Very good
Online Commercial Interaction	0.86	Very good
Intention to Use Cryptocurrency	0.904	Excellent

5. Research Model Assessment:

A Statistical Methodology applied to integrate observed and latent variables and under constrain the causation relationships and control the measurement errors is known as Structural Equation Modeling (SEM) (Mueller and Hancock, 2018). In this study, the researcher examines the impact of these three variables on intention to use cryptocurrency in developing economies with the mediating variables of online social interactions and online commercial interactions using the SEM methodology. The model consists of two parts of research i.e., measurement model and structural model. This measurement model established the relationships between the observed

indicators of perceived usability, perceived usefulness, perceived risk, online social interactions and online commercial interactions, and the latent variable, which are perceived usability, perceived usefulness, and perceived risk. It ensures that it is valid and reliable in capturing the perceptions and actions of the users. Conversely, the structural model indicates the relationship of these latent variables in order to affect the intention to adopt cryptocurrency. Specifically, the first assumption is that perceived usability and perceived usefulness will have a direct positive correlation to the adoption, and perceived risk will have a mediating influence on the propensity of users to use in cryptocurrency trading. Also, commercial interactions and social interactions online serve as mediator in determining whether the usage, usefulness and risk perception will have different impacts on the adoption decisions.

To validate hypothesized relationships, quantification of strength and significance of these relationships is done using SEM (path coefficients estimated), which is used to validate hypothesized relationships (Kock, 2018). The model of the structure is shown in *Fig. 2* where the variables are linked to the rest of the set and their respective contribution to the adoption of the cryptocurrency. This analysis's findings offer a deeper understanding of the psychological and behavioral drivers that are contributing to crypto adoption in such a context of regulatory uncertainty, and unfamiliarity with finances, for developing economies.

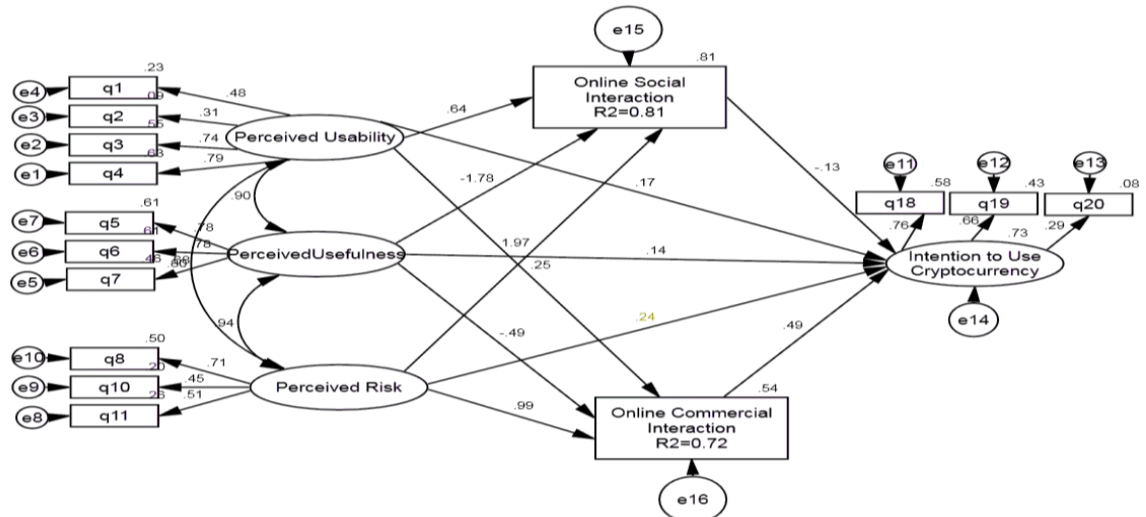


Figure 2 Structural model with standardized path

5.1. Specification and Assessment Criteria:

In order to validate and confirm the reliability and validity of the research model, measurement model was evaluated by means of Confirmatory Factor Analysis (CFA) for fitting. CFA is key to the Structural Equation Modeling (SEM) process as it validates what the relationships are between observed indicators and associated latent constructs, leading to proper measurement (Orçan, 2018). This serves to verify this theoretical framework because the variables, perceived usability, perceived usefulness, perceived risk, online social interactions, and online commercial interactions, are statistically valid representations of these variables. After running CFA, the model is made more credible by validating these constructs before testing the hypotheses.

This statistical criterion widely adopted to assess model fit, and the measurement model fits the data well. Fit Indices such as Chi square over Degrees of Freedom (χ^2/df), which should be <3 and goodness of fit measures, such as GFI, TLI, CFI, and IFI, should be greater than 0.80 to indicate fit of a given model. To maintain model

parsimony, the Parsimonious Comparative Fit Index (PCFI) should be >0.90 ; and the Root Mean Square Error of Approximation (RMSEA) should <0.90 to minimize errors. In addition, factor loadings should be greater than 0.50 to confirm the strong relationship between indicators and latent constructs and the Critical Ratio (CR) should be larger than 1.96 to determine the statistical significance.

Therefore, these assessment criteria can be employed in refining the research model so that hypothesis testing and result interpretation become more accurate. This makes the empirical robustness of the study by ensuring that the constructs meet these statistical thresholds, which in turn provides more reliable insights into the factors affecting cryptocurrency adoption in developing economies. The detail of model assessment criteria used in this study is presented in *table 4*.

Table I Model assessment criteria

Measure	Requirement	Used to assess	References
χ^2	$\chi^2 < df$	Model fit indices	Garson, 2006 Hair <i>et al.</i> , 2013 Kline, 2011 Koufteros 1999
Df	>0		
χ^2/df	<3		
GIF	>0.80		
TAG	>0.80		
CFI	>0.80		
IF	>0.80		
PCFI	>0.90		
RMSEA	<0.90		
Factor loadings	>0.50	Convergent validity	Hair <i>et al.</i> , 2013 Koufteros., 1999
Critical ratio (CR)	>1.96		
R^2	>0.50		

5.2. Testing hypotheses:

The results of hypothesis testing, as presented in *Table 5*, confirm the significance of the proposed relationships in the research model. The findings indicate that perceived usability ($\beta = 0.167$, $p < 0.001$) and perceived usefulness ($\beta = 0.144$, $p < 0.001$) both have a significant positive effect on the intention to use cryptocurrency, suggesting that users are more likely to adopt cryptocurrency when they find it easy to use and beneficial. Additionally, perceived risk ($\beta = 0.244$, $p < 0.001$) also has a significant impact on adoption, indicating that risk perceptions influence decision-making, though perceived risk does not entirely discourage users from adoption.

It is also found that online social interactions and online commercial interactions play a mediating role in influencing cryptocurrency adoption, which are supported by the results. There is a strong positive impact of perceived usability to online social interaction (0.635 , $p < 0.001$) which subsequently impacts adoption. Nevertheless, the perceived usefulness is negatively path-coefficient ($2 = -1.781$, $p = -0.001$) in online social interaction, which means that usability promotes engagement but usefulness on its own may be not the compelling factor to promote social-driven adoption. On the other hand, perceived risk ($= 1.965$, $p < 0.001$) is a strong factor that affects online social interaction, indicating that individuals socialize in cryptocurrency to reduce uncertainties surrounding their cryptocurrency.

Likewise, online commercial transactions have mediating impacts of usability, usefulness, and risk on adoption. Perceived usability ($= -0.253$, $p = 0.001$) has a positive influence on commercial interactions, which confirms that a user-friendly system of cryptocurrencies stimulates transactions. Nevertheless, perceived usefulness negatively affects (0.493 , $p = 0.001$) so that the perceived usefulness alone will not lead to commercial interactions by the user unless usability and trust are supported. Conversely, the concept of perceived risk ($7 = 1.965$, $p = 0.001$) is a

very powerful predictor of commercial interactions, and one can conclude that risk-sensitive users are dependent on commercial interactions in order to make informed decisions.

The model fit indices also demonstrate that the research model has a high overall fit to the data. The $2.428 / df = \text{Chi-square/degrees of freedom} = 2.428$, $0.907 = \text{GPI}$, $0.938 = \text{TLI}$, $0.969 = \text{IFI}$, $0.905 = \text{CFI}$, and $0.842 = \text{PCFI}$ are all greater than the acceptable level and this implies that the model fits well. Also, the value of the $\text{RMSEA} = 0.033$ is significantly lower than the 0.08 value, indicating that the model is characterized by the negligible approximation error. Overall, these findings confirm the research hypotheses as they demonstrate that perceived usability, perceived usefulness, and perceived risk are highly influential determinants of cryptocurrency adoption and the online social and commercial interaction is a key intervening variable. Although these findings offer empirical evidence concerning the dynamics of cryptocurrency adoption among users, especially in the developing economies, risk perceptions and digital interactions are crucial in influencing user behaviors.

Table 5 Hypothesis Testing Results

Path	Estimate	S.E.	C.R.	P	Results
Perceived Usability $\rightarrow$ Intention to use cryptocurrency	0.167	0.011	15.181	0.000	Supported
Perceived Usefulness $\rightarrow$ Intention to use cryptocurrency	0.144	0.009	16.000	0.000	Supported
Perceived Risk $\rightarrow$ Intention to Use Cryptocurrency	0.244	0.044	5.545	0.000	Supported
Perceived Usability $\rightarrow$ Online Social $\rightarrow$ Intention to use cryptocurrency	0.635	0.165	3.912	0.000	Supported
Perceived Usefulness $\rightarrow$ Online Social $\rightarrow$ Intention to use cryptocurrency	-1.781	0.374	-5.163	0.000	Supported
Perceived Risk $\rightarrow$ Online Social $\rightarrow$ Intention to use cryptocurrency	1.965	0.366	8.423	0.000	Supported
Perceived Usability $\rightarrow$ Online Commercial Interaction $\rightarrow$ Intention to use cryptocurrency	0.253	0.079	3.524	0.000	Supported
Perceived Usefulness $\rightarrow$ Online Commercial Interaction $\rightarrow$ Intention to use cryptocurrency	-0.493	0.127	-4.545	0.000	Supported
Perceived Risk $\rightarrow$ Online Commercial Interaction $\rightarrow$ Intention to use cryptocurrency	1.965	0.116	14.550	0.000	Supported

Model fit indices: $\chi^2 = 1439.973$, $\chi^2/df = 2.428$, GFI=0.907, TLI=0.938, IFI=0.969, CFI= 0.905, PCFI= 0.842, RMSEA=0.033.

5.3. Structural Model Assessment Results:

The results show the model fit indices values ($\chi^2 = 1439.973$, $\chi^2/df = 2.428$, GFI=0.907, TLI=0.938, IFI=0.969, CFI= 0.905, PCFI= 0.842, RMSEA=0.033) are within the acceptable value range and represent a better model fit.

In this part, the outcomes of the model hypothesis are presented concerning aspects like Perceived Usability, Perceived Usefulness, and Perceived Risk.

Perceived Usability: *Table 5* and *Figure 2* show that the perceived usability intention has a positive effect on using cryptocurrency with a path coefficient of 0.17 significance at P-value < 0.00.

Perceived Usefulness: *Table 5* and *Figure 2* demonstrate that the perceived advantage of using cryptocurrency positively influences a path coefficient of 0.17 significance at p-value < 0.00.

Perceived Risk: *Table 5* and *Figure 2* shows that the perceived risk affects cryptocurrency with a path coefficient of 0.244 significance at p-value < 0.00.

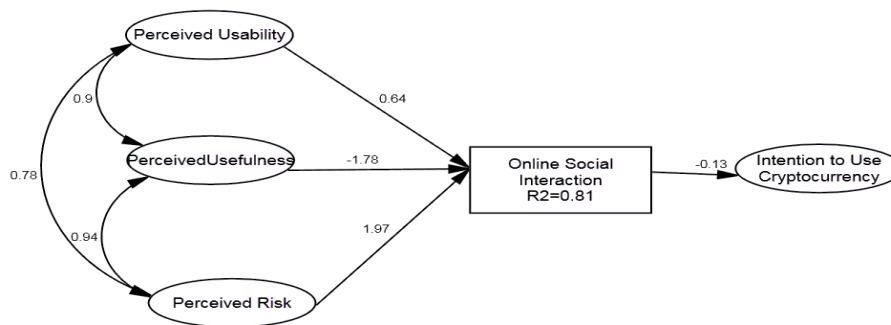


Figure 3 Online Social Mediation Factors Hypotheses

Online Social Interaction: Table 5 and Figure 3 show that perceived usability, perceived usefulness, and perceived risk affect online social interaction with path coefficients (0.64, -1.78, 1.97) respectively. At P-value < 0.00, online social interaction affects the intention of using cryptocurrency with a path coefficient of -0.13 at P-value < 0.00. R^2 of the online social interaction is 0.81 which means the online social interaction affects the relationship between (perceived usability, perceived usefulness, and perceived risk) and the intention of using cryptocurrency. Online Social Interaction has a positive mediating influence between perceived usability, perceived usefulness, and perceived risk and the Intention of Using cryptocurrency online trading is strongly supported by the data.

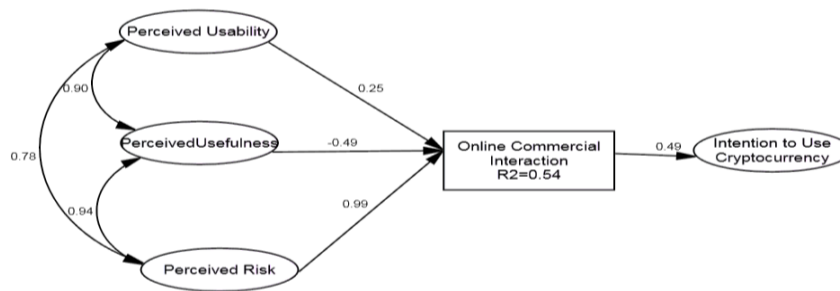


Figure 4 Online Commercial Mediation Factors Hypotheses

Online Commercial Interaction: Table 5 and Figure 4 indicate that perceived usability, perceived usefulness, and perceived risk have a positive effect on the online commercial interaction with path coefficients (0.25, -0.49, 0.49) respectively are significant at P-value < 0.00, and the online commercial interaction affects the intention of using cryptocurrency with path coefficient 0.49 is significant at P-value < 0.00. R^2 of the online commercial interaction is 0.54 which means the online

commercial interaction effect on the relationship between (perceived usability, perceived usefulness, and perceived risk) and the intention of using cryptocurrency with 54%. The online commercial interaction has a positive mediating influence between perceived usability, perceived usefulness, and the intention of using cryptocurrency online trading is strongly supported by the data.

6. Discussion:

This research paper provides detailed insights of cryptocurrency adoption in developing economies (Bhimani et al., 2022; Sharma et al., 2021) as well as focusing on Jordan. Being a country experiencing a fast digital transformation and receptive to financial technology, the Jordanian adoption of cryptocurrency is both an opportunity and a challenge (Adaileh & Alshawawreh, 2021; Orabi, 2024). The results indicate that perceived usability, perceived usefulness, and perceived risk can influence adoption, but that online social and commercial interactions mediate these effects. In developing economy digital financial adoption factors represent broader dynamics because of regulatory uncertainties, technological infrastructure and user trust (Shahadat et al., 2023).

Usability and usefulness are significant for adoption and users in Jordan are more likely to interact with cryptocurrency when they believe that it is easy to use and beneficial. It is also in line with the country's ever increasing trend in digital payment adoption, with the fintech applications gaining more popular use (Al-Naimi & Yousef, 2021; Anagreh et al., 2024). Nevertheless, the perceived risk is still a major factor because many individuals in countries lack financial security, and have a fear being scammed or lack of trust on government to control or regulate digital means (Bartoletti et al., 2021; Omarova, 2020). Transparent, fast, and low cost are the values that have led nations that have recently ignored cryptocurrencies, but a

broader sentiment in developing economies as financial systems evolve and digital assets are still not fully trusted (Prasad, 2021; Sestino et al., 2024). The research shows that perception of the usefulness and usability have positive influence on intention to use cryptocurrency and the negative effect of perceived risk that may reduce the adoption unless the risk is mitigated by trust building mechanisms. The risks of online social interactions are mitigated by the peer discussions, knowledge sharing, and trust building, which are important in offline social contexts, but especially when skepticism towards digital finance is high online (Delfabbro et al., 2021; Mendoza-Tello et al., 2018; Mirtaheri et al., 2021). The existence of active cryptocurrency communities in Jordan through social media groups and online forums implies that users count on peer networks to vouch for the legitimacy of digital assets before making investment choices (Coulter, 2022). Similarly, the adoption of crypto enabled platforms and services are reinforced through online commercial interaction by creating a transactional engagement opportunities (Sáez, 2020). This shows that social brewing and commercial exposure play a huge role in the user confidence in cryptocurrency. The mediating effect of online social and commercial interactions in terms of adoption is demonstrated with users in digital platforms for reassurance, information, and trading opportunities.

In crypto market the challenge of adopting the use of cryptocurrency in Jordan differs from these developing economies where regulatory ambiguity, low financial literacy and asset market segmentation are present (Siriopoulos, 2021). Jordan's central bank has warned informally against cryptocurrency transactions (Halabi, 2021). Although adoption continues to rise because of youth's engagement in digital finance. The Arab Monetary Fund (2023) stated that Jordan ranks amongst the highest in fintech adoption in the MENA region (Hussainey & Dalwai, 2024), while

cryptocurrency is largely unregulated giving potential users a cause for concern (Cumming et al., 2019).

Additionally, the World Bank (2022) noted that financial literacy in Jordan remains low at 33% of adults that possess basic knowledge of financial concepts that might lead to risk averse behavior in regards to digital currencies (Alqam & Hamshari, 2024). The statistics further prove that the adoption of these offerings is in fact based around education and clarity in regulations.

In other developing countries who embraced cryptocurrency as a financial system, Jordan, a developing country, has been rather careful about the subject because of its regulation issues (Grossman, 2022). Nigeria for example runs on high crypto adoption on account of inflation driven demand for alternative assets in and Nigeria's crypto adoption is largely influenced by tech savvy youth looking for investment opportunities and not an alternative to fiat (Kayani & Hasan, 2024). Based on this comparison, different socio-economic and regulatory environments have influenced the motivation and barriers to cryptocurrency adoption in different developing economies.

The Technology Acceptance Model (TAM) is extended to include these contextual factors in the research in order to have a more holistic framework that once applied to other economies in the process of development and even offer the same challenges. The results are the echo of the fact that adoption does not hinge on the perceived ease of use and usefulness; instead, adoption is very contingent upon the social networks, the perceived risks, and regulatory clarity (Baabdullah, 2020; Hubert et al., 2019). Theoretical implications are that risk perception may serve as a moderator variable in the relationship between the perceived usefulness and actual adoption particularly where there is uncertainty in the regulatory environment. Also,

the study was connected to the theories of innovation diffusion that reveal that peer validation is a critical success factor toward the adoption of cryptocurrency, which users must undertake the digital finance (Hemantha, 2021; Islam et al., 2023).

7. Practical Implications for Stakeholders:

The result of this research paper can be of great benefit to various stakeholders such as policy makers, cryptocurrency business ventures, and online trade forums in ensuring that the adoption of block chain-based cryptocurrency is enhanced. Consequently, the policymakers in Jordan and other developing economies, ought to formulate clear regulatory structures to address the issues of users regarding crypto risks. The need to reduce uncertainty and bring a safe environment to digital financial transactions requires regulatory clarity (Putrevu & Mertzanis, 2024).

Adoption of a balanced regulatory approach can benefit governments to empower innovation while ensuring for the protection of consumers (Mahardhani, 2023). Bundling with the efforts of financial institutions to establish safer digital payment channels and fostering the exchange of public education of crypto risks and benefits, all of these factors further enhance the currency's transparency (Sharif, 2023).

For crypto firms, improving the usability and accessibility of a platform is key to catching traction. Educational content incorporated into the user interface and simplifying the user interface can help in the learning of new users to the extent that cryptocurrency is a new economy. Social media can be used to develop the cryptocurrency platforms' digital marketing strategies with the help of influencer collaborations and community engagement initiatives to improve the perception of cryptocurrency platforms from the users' standpoint. Businesses using informed and engaged user base can speed up adoption rate, especially for new digital finance entrants in Jordan who are more likely to be using digital finance. Having social and commercial engagement features that enable people to engage in the cryptocurrency

space online trading platforms have become the key tools in adopting cryptocurrency. User involvement and reducing risk can be achieved through platforms that have user reviews, rating systems, social media sharing capabilities. Moreover, providing some additional security measures which include multi factor authentication and fraud detection system can institutionalize trust and guarantee transactional security. Enhancing these aspects increases people's credibility of cryptocurrency platforms and encourages participation in digital financial ecosystems more broadly. As a result of Jordan's involvement in e-commerce and FinTech app development, integration of cryptocurrencies into safe, user-friendly e-commerce and FinTech app platforms will be a leap in facilitating adoption.

8. Conclusion:

This study reviewed the prevailing factors, which influence the adoption of cryptocurrency in emergent economic system by evaluating the usability and usefulness and the perceived risk and social network and e-market interactions online in Jordan. The findings of the research directly respond to the initial research questions that were given in the beginning of the study. The use of cryptocurrency is dependent on three key defining factors, which are perceived usability and perceived usefulness and perceived risk. The effects of usability and usefulness on adoption are positive but the significant adoption barriers due to perceived risk which are mainly security issues and fraud concerns coupled with uncertainty of the regulations cannot be overcome. The study proves that the adoption opportunities increase when users can discover cryptocurrency to be available and helpful due to the increased levels of convenience of ease of use and utility. Trust building and clarity of regulations should be built since perceived risk is a major challenge that should be overcome during adoption. The study defines online social and business relations as

critical sources of regulation that enable adoption. The information flow between the activities of users on the Internet serves to discard the suspicions of a diminished level of security, and the transactions via e-commerce promote the belief in the advantages and competence of transactions. Cryptocurrency adoption can be aided by the implementation of strategies comprising financial literacy and clear rules and intuitive platform layouts. Cryptocurrency platforms should improve their interaction means in addition to intensifying security services and usability to be at the same efforts as the government to set up legal frameworks as comprehensive as possible to mitigate uncertainty. The choice to use technology acceptance model with social and commercial components to the adoption of cryptocurrency discusses the prevalence of acceptance in emerging economies. The study is well-integrated in the way its influence on adoption behavior has been elucidated in the conclusion section of the study, by having compiled all the important findings.

8.1 Limitations:

Study, however, has certain limitations, but it also contributes to certain aspects. It is a cross-sectional study since it records data at a single time point. This method is not perfect because it does not allow us to see the change in behavior and attitude during time. The results are also specific to Jordan and in nations with such characteristics.

8.2 Future Work:

The current study suggests that further studies should be conducted using better research methods in order to propagate their findings. Scholars' ought to undertake long-term studies on the actions and attitudes of investors concerning cryptocurrencies in order to identify the transformation of behaviors in the market over the years (Al-Mansour, 2020). The longitudinal study to obtain accurate findings must be based on repetitive questionnaires that are used among the same

respondents through time to determine the change in attitude. Research regarding the implementation of cryptocurrency in various jurisdictions and nations should be a fundamental part in order to confirm initial results and learn factors that influence the process of cryptocurrency adoption based on national economic and cultural factors. The market requires further investigation of crypto wearability along with the existing mining processes and patterns of platform transformation (Bajra et al., 2024; Fang et al., 2022).

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نمذجة نية استخدام العملات المشفرة: تأثير نموذج قبول التكنولوجيا والمخاطر والتفاعل عبر الإنترنت

الملخص

تسعى هذه الدراسة إلى تحديد الجوانب المرتبطة بتبني العملات المشفرة القائمة على تقنية البلوك تشين من منظور سلوك الأفراد في الأسواق الناشئة كالأردن. وقد تم وضع إطار عمل للدراسة لاستكشاف كيفية ترابط سهولة الاستخدام المتصورة، والفوائد المتصورة، والمخاطر المتصورة، ونية استخدام العملات المشفرة. وتتناول هذه الدراسة عوامل مثل التفاعلات الاجتماعية والتجارية عبر الإنترنت. وتتكون عينة البحث من أفراد من الأردن تبلغ أعمارهم 18 عامًا فأكثر، ولديهم مهارات استخدام الإنترنت (4686 مشاركًا). تهدف الدراسة إلى تحقيق هدفها من خلال منهج تحليلي يتضمن إجراءات على مرحلتين: تحليل نموذج القياس، ونموذج تفسيري لنية استخدام العملات المشفرة (تحليل النموذج الهيكلي). تقيم الدراسة مدى ملاءمة النموذج وتفحص معامل المسار لمعالجة فرضيات البحث المطروحة. وقد كشفت الدراسة أن جميع جوانب النموذج المقترح تؤثر في قرار استخدام تقنية العملات المشفرة في التداول عبر الإنترنت. بالإضافة إلى ذلك، قدمت الدراسة مساهمات من خلال تسليط الضوء على نية استخدام منصات تداول العملات المشفرة في الاقتصادات النامية مثل الأردن.