

Adoption of cryptocurrencies for remittances in the UAE: the mediation effect of consumer innovation

Adoption of the
cryptocurrency
in UAE

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Devid Jegerson

Abu Dhabi University, Abu Dhabi, United Arab Emirates

Mehmood Khan

University of Sharjah, Sharjah, United Arab Emirates, and

Charilaos Mertzanis

Abu Dhabi University, Abu Dhabi, United Arab Emirates

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Abstract

Purpose – This study investigated the internal factors that influence the adoption of cryptocurrencies for remittance transactions in the United Arab Emirates (UAE) by examining the relationships between behavioural intention (BI) and perceived risk (PR), as well as the mediating effect of consumer innovation (CI).

Design/methodology/approach – The authors developed a structural model using scales from the literature. The authors distributed an online questionnaire, evaluated by five cryptocurrency experts, using a snowball approach and collected 270 responses.

Findings – The results revealed that CI mediates the relationship between PR and BI. Also, CI enhances intentions to use cryptocurrencies for remittance transactions. However, PR has a negative impact on BI.

Research limitations/implications – This research adds to the body of knowledge by examining the acceptance and implementation of cryptocurrencies in the UAE and by developing and evaluating new constructs based on current notions. The study also contributes to the current understanding of cryptocurrencies and blockchain adoption. This article focusses on the mediating impact of CI on intentions to employ cryptocurrency instruments for international money transfers.

Practical implications – The conclusions of the research give advice for marketers on how to boost the commercialisation of cryptocurrencies in the UAE remittance market and may pave the way for other studies to assist impending developments in the UAE cryptocurrency industry.

Originality/value – This research offers novel insights into CI as a significant predictor of bitcoin product uptake in the remittance business.

Keywords Cryptocurrencies, Blockchain, Remittances, Innovation, Financial inclusion

Paper type Research paper

1. Introduction

1.1 Overview

Financial inclusion is vital for enabling people to transfer money because it allows access to the economic infrastructure that permits transfers between senders and receivers (Marcelin *et al.*, 2021).

The money transfers between different countries are called remittances and represent a significant financial service provided almost uniquely by banks and financial institutions, enabling consenting migrants to transfer money to their countries of origin (Emara and Mohieldin, 2020). However, remittances typically incur costs for using the financial infrastructure due to exchange rate differences between transfer currencies (Chuc *et al.*, 2021). High prices drive migrants to find informal channels to send money home instead of using formal banking channels (Hudaefi, 2020), and reducing remittance costs is one of the 2030 Sustainable Development Goals (SDG 10) issued by the United Nations.



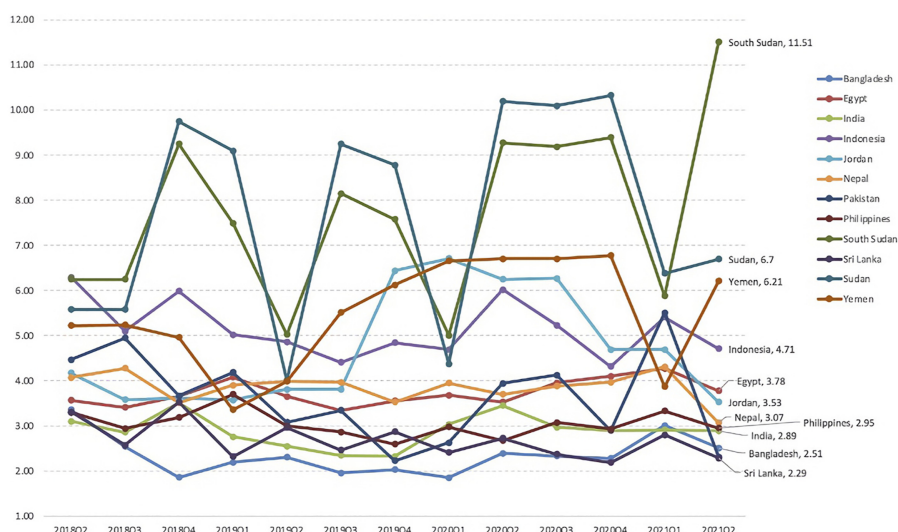
Remittance fees are often a negligible component of monetary transfers (such as in international commerce, foreign direct investments or development assistance) since they represent a tiny percentage of the overall transfer amounts. However, remittance fees are sometimes relatively high for international transfers, creating a financial strain on both sending migrants and receivers, so the latter profit less from the efforts of their relatives living abroad. In terms of supply, the largest global banks prefer to focus on high-quality remittance services rather than those specifically designed for migrant workers (Ratha and Riedberg, 2005; Solimano, 2003). In addition, poor immigrants who typically move small-value remittances may feel uncomfortable using formal services provided by banks or money transfer companies, preferring to rely on unofficial channels, such as relatives or friends, the hawala system (an informal method of transferring money without physical money actually moving, which relies heavily on trust and balancing hawala brokers' books) or transport companies (Ahmed *et al.*, 2021).

1.2 Significance of the study

According to the World Bank, low- and middle-income countries (LMICs) gain huge foreign currency benefits via remittances. These foreign currency flows surpass the foreign direct investment and official development aid flows of many nations. In 2020, developing nations received 540bn USD in remittances, a significant increase from 2010s total of around 345bn USD ("World Development Report 2021: Data for Better Lives", 2021). A World Bank 2021 report indicated that the 2021 flow of remittances to LMICs had increased by 58% compared to 2010 ("World Development Report 2021: Data for Better Lives", 2021). However, these estimates are likely to be low, given many remittances are sent via unofficial methods. Such informal transfers may account for 50% or more of the balance of payments (Freund and Spatafora, 2008). The 2021 World Bank report showed that, in the case of the Middle East, remittances constituted 2.4% of total GDP (3.026 trillion USD in 2020; World Bank, 2022); however, the number was much higher for countries such as Lebanon (18.9% of GDP) and Egypt (8.2% of GDP). Saudi Arabia and the United Arab Emirates (UAE) are the wealthiest countries in the Middle East, employing guest workers from many different parts of the world; hence, they are the second- and third-biggest senders of remittances in the world.

According to the 2021 DataBank of the World Bank, Bangladesh, Egypt, India, Indonesia, Jordan, Nepal, Pakistan, the Philippines, South Sudan, Sri Lanka, Sudan and Yemen are the most frequent beneficiaries of remittances from the UAE. Consequently, the average charge for transferring \$200 from the UAE to a poor country was 4.37% in the second quarter of 2021, almost the same as in previous quarters (World Bank, 2022) and more than 150% of the SDG goal of 3% by 2030 (see Figure 1).

Given the significance of remittances to developing nations, scholars and policymakers are eager to learn how the costs of remittances might be decreased to achieve financial inclusion goals (Kakhkharov *et al.*, 2017). According to Chainalysis (2021), the global adoption of cryptocurrencies is skyrocketing. The Middle East and North Africa (MENA) region is the second smallest cryptocurrency economy, receiving 271.7bn USD of cryptocurrencies between July 2020 and June 2021, corresponding to 6.6% of global activity. Although this overall number is low compared to other regions, it represents a nearly 1,500% increase in MENA's total activity in 2021, making it one of the fastest-growing markets in the world. Despite this growth, MENA countries have had relatively little widespread cryptocurrency acceptance and usage (Chainalysis, 2021). According to the Global Crypto Adoption Index for the MENA region, Afghanistan is the highest-rated country at 20, followed closely by Turkey at 26, which contrasts sharply with the UAE at 100 and Saudi Arabia at 123 (Chainalysis, 2021). Blockdata researchers have claimed that many people in the Middle Eastern countries have turned to cryptocurrencies to protect their savings from currency devaluation – a trend



Source(s): World Bank Open Data, n.d.

Figure 1.
Remittance prices
worldwide (corridors):
the cost of sending and
receiving relatively
small amounts of
money from the UAE
to different countries

also seen in other emerging markets, such as Africa and Latin America. Also, a recent news article suggested that many people in Afghanistan are using cryptocurrencies to preserve their savings amid the economic uncertainty caused by the recent drain on banks following the return of the Taliban and the ensuing chaos in Afghanistan's central bank (MacKenzie, n.d.). However, there are not enough data on trade in Afghanistan to thoroughly examine the extent of this activity (MacKenzie, n.d.).

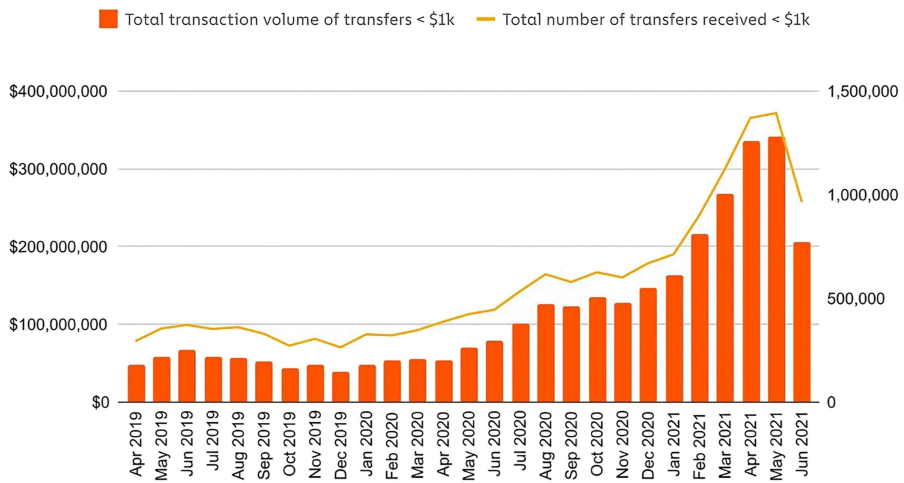
Remittances are a key use case for cryptocurrencies in many MENA countries, mirroring similar trends in other emerging markets. The following graph shows the monthly growth in cryptocurrency payments below 1,000 USD by volume and the number of transfers, considering the upper limit of estimated transfer payments to MENA countries (see Figure 2).

1.3 Purpose and contribution

Despite blockchain and cryptocurrency technology becoming a hot topic for many new payment platforms, especially financial applications, as Chainalysis data have shown (Chainalysis, 2021), the UAE customer usage is still lower than expected (Wunsche, 2016). This concern has led researchers to investigate why customers still abstain from using cryptocurrencies supported by blockchain technology. Meanwhile, most people continue to use traditional banking services that impose high costs to avoid long periods without data protection or control (Martins *et al.*, 2014). By disrupting the traditional trusted bank model, cryptocurrencies provide a way to establish universally accepted financial norms and procedures (Mendoza-Tello *et al.*, 2019). To the average person, cryptocurrencies may as well not exist; nonetheless, this raises the question of why people do not use them for their regular online transactions, especially in the UAE, where remittance transfers occur daily. This is why it is crucial to study how the revolutionary change brought about by cryptocurrencies affects people's acceptance of monetary transactions. Therefore, this research examined customer behaviours regarding cryptocurrency transfer transactions supported by blockchain technology in the context of UAE remittance services.

Adopting blockchain technology for cryptocurrencies is complicated (Norta *et al.*, 2019), and a single model alone cannot be comprehensive. A model should be combined with other

Figure 2.
Estimated
cryptocurrency
remittance payments
in the Middle East
(April 2019–June 2021)



Source(s): Chainalysis (2021)

significant constructs to develop a modern blockchain-compatible model (Toufaily *et al.*, 2021). Few recent studies investigating cryptocurrencies in the UAE have considered perceived risk (PR) and consumer innovation (CI) as constructs (Abbasi *et al.*, 2021; Hirunyawipada and Paswan, 2006), although other studies regarding mobile and Internet banking adoption and electronic payments have based their results on these constructs (Alalwan *et al.*, 2017; Huang, 2019; Koroma *et al.*, 2022). In the previous literature, customer behaviour indicators, such as PR and CI, have been used to assess their impact on blockchain and cryptocurrency adoption in the UAE (Alqaryouti *et al.*, 2020a, b; Saif Almuraqab, 2020). The study applies the unified theory of acceptance and use of technology (UTAUT2) and innovation diffusion theory (IDT) to answer the following research questions:

RQ1. To what extent does PR impact behavioural intention (BI) to use cryptocurrencies for remittance transactions in the UAE?

RQ2. How does CI mediate the impact of PR on BI?

Due to the novelty of blockchains and cryptocurrencies in the UAE, this research adds to the literature on cryptocurrency use in the nation. Moreover, this study thoroughly examines the obstacles facing the adoption of cryptocurrencies in the UAE's remittance business. We introduced CI as a mediator and explored PR's effect on BIs. While PR influences BI's intention to utilise cryptocurrencies for remittances, CI is sufficient to promote such intents.

This research contributes to the current literature by providing scholars and practitioners with significant insights regarding bitcoin usage in the UAE. In addition, it demonstrates the nation's readiness for pursuing broader reforms and structural adjustments.

The remainder of the paper is structured as follows. The second section explores the relevant literature. Sections 3 and 4 describe the hypotheses' supporting theories and the data gathering methods, respectively. Section 5 offers the findings, Section 6 the discussion and Section 7 the conclusion.

2. Literature review

Several theoretical and empirical studies dating back to the early 1990s confirm the presence of a causal link between financial expansion, improved business performance and increased

economic output. Evidence suggests that better capital allocation and risk management and a higher share of creative and productivity-boosting investment initiatives are all outcomes of financial development. The impacts of financial deepening, or the amount of credit available to the private sector, have received the lion's share of attention in the existing literature (Chauvet and Jacolin, 2017). These studies find that remittances have a favourable effect on financial depth, but they don't say much about how they affect financial inclusion. Inclusion in the financial system does not equate to a robust one. If a significant number of credits are distributed to a small number of families, financial depth may rise while financial inclusion falls. To give just one example, while it's true that more significant remittance inflows boost financial depth at the national or local level, this does not automatically translate to increased financial inclusion for the people that receive them. In particular, poorer remittance recipient families may be excluded from the financial system when the rise in credit at the macro level owing to increasing remittance flows is instead routed to non-remittance recipient households. Even if remittance recipients don't open accounts, the remittances they send home will likely be deposited into the accounts of people who aren't remittance recipients (Anzoategui *et al.*, 2014).

An untapped but sizable market for improved services is people who use cash or other non-digital forms of payment in the physical, cash-based, or informal economy. There is significant unrealised potential for economic growth and corporate profit in bringing financial services to the world's more than two billion adults who are now excluded from the global financial system. Innovative banking services for underserved people are crucial for fighting poverty and expanding economies (Norta *et al.*, 2019). In addition, 250 m migratory workers, tourists, permanent travellers, ex-pats, digital nomads and foreign students become underbanked while working and travelling worldwide (Christiansen *et al.*, 2019). Access to credit and money movement might be difficult for those with no local credit history or bank accounts. It's also impossible to establish a solid credit history while relying on cash flow that can't be verified (Chauvet and Jacolin, 2017).

The blockchain is the primary technology enabling the success of cryptocurrencies. Blockchain is a decentralised system that employs a digital ledger to chronologically, visually, competently, verifiably and forever record transactions between two parties (Reid and Harrigan, 2013). The ledger's security is maintained by the miners who administer it (Hashemi Joo *et al.*, 2020). The key distinction between blockchain and other systems is that blockchains have a decentralised structure without a dominating provider and are built on a network of communicating nodes that form the blockchain framework. Prior to the invention of blockchains, a centralised authority was required to control and oversee the whole system in order to build a secure transactional framework for numerous parties (Zakaria *et al.*, 2019).

A blockchain is a distributed database that is accessible to all network users. The records that are continually added to the network are known as blocks. These blocks feature timestamps that are connected to earlier blocks, creating informational chains. Mining is the act of adding blocks to a chain, and the system creates tokens that are allotted to different nodes through a node reformulation procedure. These tokens are referred to as cryptocurrencies because they may be traded similarly to conventional currency (Morkunas *et al.*, 2019).

Blockchain uses cryptography to safeguard the general ledger from tampering. All users can access the public ledger, but only those with special cryptographic keys can add new records. Other network users can then validate the new records and determine whether to add them to the general ledger. This mechanism makes it almost impossible to change or fake archives. Furthermore, because each block includes data from previous blocks, it is practically impossible to change the recorded transactions in a block (Morkunas *et al.*, 2019).

The explanation below explains how a cryptocurrency network using blockchain technology to provide secure and transparent transactions without a financial middleman

(Hashemi Joo *et al.*, 2020). On the cryptocurrency network, every participant has a cryptocurrency wallet. Each cryptocurrency owner has access to a key pair: (1) a public key comparable to an e-mail address or bank account number that is the address of the user's cryptocurrency wallet, which the owner can share with other users of the cryptocurrency network to send virtual coins to their cryptocurrency wallets, and (2) a private key that authorises the user to send cryptocurrencies that were previously transferred to his or her cryptocurrency wallet to the wallets of other users (Reid and Harrigan, 2013). When cryptocurrency owners move coins to the wallets of other network users, they send messages to other network users and sign the messages with their private keys.

People, companies and regulators are all impacted by the development of cryptocurrencies (Elbahrawy *et al.*, 2017; Morkunas *et al.*, 2019). With the help of cryptocurrencies, users now have a new, trustless method for transferring money through networks. People may now send and receive money quickly, easily and affordably thanks to this (Abramova and Böhme, 2016; Khairuddin *et al.*, 2016). From the standpoint of merchant e-commerce, it presents companies with a fresh method of receiving payments from (Baur *et al.*, 2015). As Sobhanifard and Sadatfarizani (2019) emphasised in their research, this innovative technique allows firms to rapidly and cheaply collect payments from overseas clients at better exchange rates than before (Khairuddin *et al.*, 2016; Sas and Khairuddin, 2017).

Numerous academics have highlighted the value of learning about the aspects that affect people's adoption of cryptocurrencies (Elbahrawy *et al.*, 2017). However, according to Alzahrani and Daim (2019), the available research on the use of cryptocurrencies is still fragmented. These studies have used a variety of theories to investigate the adoption of cryptocurrencies, with the majority of them focussing on the acceptance of cryptocurrencies as adoption decisions (Albayati *et al.*, 2020; Alqaryouti *et al.*, 2020a, b; Arias-Oliva *et al.*, 2021; Gil-Cordero *et al.*, 2020; Nadeem *et al.*, 2020; Saif Almuraqab, 2020). Additionally, other research have asserted that elements like trust, safety and the cryptocurrency's reputation precede acceptance (Huang, 2019; Murko and Vrhovec, 2019; Sas and Khairuddin, 2017). In order to have a comprehensive knowledge of the elements influencing the acceptability and adoption of cryptocurrencies, it is crucial to analyse and synthesise these research.

Table 1 shows the papers that were chosen and retrieved from the EBSCO, SCOPUS and Google Scholar databases between the years of 2017 and 2022 using the keywords "cryptocurrency," "blockchain," and "adoption." The authors, year of publication, country of reference, methodology and theoretical underpinnings and article results were the data pieces that were extracted from each research study and placed into a spreadsheet. On the basis of the chosen theories, research techniques and settings of examination, the research articles were then thoroughly reviewed.

3. Theoretical background

Prior studies on the adoption of cryptocurrencies mostly focussed on behavioural or technical acceptance theories. The literature on technology adoption and IDT on initial consumer acceptance and subsequent sustained intents to use cryptocurrency served as the theoretical foundation for this research. Consumer acceptance and use patterns for digital mobile payments have been the subject of several research. These two actions are academically distinct notions that are influenced by a variety of situations (Santhanamery and Ramayah, 2018). After early acceptance, the usage of an information system may eventually change for the better or worse, depending on how users react to it (Venkatesh *et al.*, 2012).

In-depth research has been done on the adoption topic in the literature. The Technology Acceptance Model (TAM), one of the main models used by academics, enables them to comprehend the impact of customers' attitudes and beliefs on their initial acceptance or

Authors	Year	Country/region	Method	Theoretical foundation	Findings
Shin and Rice	2022	UAE	Mixed	N.A.	A series of challenges, including trust, cybersecurity, and scalability, have emerged. Cryptocurrencies form a sociotechnical system that constitutes new and important objects of social enquiry
Koroma <i>et al.</i>	2022	China	Quantitative	TAM	This paper examined trust's influence on decision-making regarding cryptocurrency. The results showed a positive relationship between technology attachment and behaviour and the effects of blockchain transparency on cryptocurrency, blockchain transparency on behaviour, and crypto trust on behaviour
Arias-Oliva <i>et al.</i>	2021	Spain	Quantitative	fuzzy set Qualitative Comparative Analysis (fsQCA)	Despite social influences, perceived risk (PR) and financial literacy were not significant; however, they influenced intentions to use cryptocurrencies when combined with other factors
Albayati <i>et al.</i>	2020	N.A.	Quantitative	TAM	The findings of this study identified two powerful constructs (regulatory support and experience) that encourage customer trust towards blockchain-based applications
Alqaryouti <i>et al.</i>	2020a	UAE	Qualitative	TAM	The results revealed a positive relationship between perceived ease of use (PEU) and usage behaviour. No significant relationship was found between the perceived benefits of cryptocurrency and usage behaviour
Anser <i>et al.</i>	2020	China	Quantitative	TPB	Use of social media was positively associated with users' intentions to adopt Bitcoin. Individuals' intentions were associated with their actual behaviour towards the adoption of Bitcoin, and PR was a moderator between intentions and actual behaviour
Gil-Cordero <i>et al.</i>	2020	Spain	Quantitative	TAM	The results showed that all the proposed constructs had a significative influence on intentions to use cryptocurrencies, either directly or indirectly

(continued)

Table 1.
List of the reviewed
research papers

Authors	Year	Country/region	Method	Theoretical foundation	Findings
Nadeem <i>et al.</i>	2020	China	Quantitative	TAM	Expectation (EX) had a positive impact on perceived enjoyment (PE) and PEU. EX, PE, and PEU had a significant impact on satisfaction (SA). PE, perceived usefulness (PU), and SA significantly influenced repurchase intentions towards Bitcoin
Saif Almuraqab	2020	UAE	Quantitative	UTAUT	Currency acceptance factors in the UAE have global acceptance differences and similarities regarding PU, perceived trust, social influence, and PEU
Sohaib <i>et al.</i>	2020	Australia	Quantitative	TAM	This study measured the relationship between technology readiness and acceptance and intentions to use cryptocurrency using a two-step PLS-SEM and Artificial Neural Network (ANN) approach
Yoo <i>et al.</i>	2020	Korea	Quantitative	TPB, Transaction Cost Theory (TCT), IDT and Benefit-Risk Concept (BRC)	Perceived benefits and service compatibility played notable roles in determining behavioural intentions , whereas perceived risk, cost, and complexity had no significant impact on user adoption
Huang	2019	China	Quantitative	N.A.	The majority of individuals have no understanding of the value or risks of Bitcoin; the greater the perceptions of speculative risk, the less government intervention is expected; To increase the effectiveness of regulation, value and risks should be differentiated by gender, age, income, and digital token experience
Hwang and Moon	2019	Korea	Quantitative	UTAUT	Performance expectancy can be influenced by the management and system design strategies of cryptocurrency service providers, and cryptocurrency systems should be promoted in a pleasant and beneficial way. Perceived security concerns and PR can negatively affect cryptocurrency use and trading

Table 1. (continued)

Authors	Year	Country/region	Method	Theoretical foundation	Findings
Mendoza-Tello <i>et al.</i>	2019	Spain	Quantitative	TAM	Perceived trust, PR, and PEU are not strong predictors of intentions to use cryptocurrencies, and the strength of their effects is determined by PU
Murko and Vrhovec	2019	Slovenia	Quantitative	N.A.	Besides known factors, trust in Bitcoin security influences adoption. There is no support for the influence of the perceived threat of Bitcoin scams or Bitcoin anonymity on Bitcoin adoption
Roussou <i>et al.</i>	2019	Worldwide	Quantitative	Innovation-Decision Process Model (IDPM), TAM	Perceived security and Perceived Usefulness were found to be significant factors. Moreover, compatibility with existing values and practices indirectly affected the actual use of digital currencies
Sobhanifard and Sadatfarizani	2019	Iran	Mix	N.A.	Thirty-one factors affected cryptocurrency usage. This study also confirmed that technological skills, technological ambiguity, and technological advantages positively affect cryptocurrency usage
Yeong <i>et al.</i>	2019	Malaysia	Quantitative	UTAUT2	The findings of a pilot study confirmed that the measurement items and constructs of the proposed model were reliable and valid
Schaupp and Festa	2018	USA	Quantitative	TPB	The findings of this study are consistent with those of prior research examining the theory of planned behaviour and technology adoption (TPB). A TPB model explained 58% of the variance in intentions to use cryptocurrency
Lee <i>et al.</i>	2018	Korea	Quantitative	Partial Least Squares-Structural Equation Modeling (PLS-SEM)	Asset and currency attitudes influenced intentions to adopt Bitcoin, except for the influence of PEU. Construct relationships differed between the high and low innovation groups
Kazerani <i>et al.</i>	2017	Canada	Qualitative	Human-Computer Interaction (HCI)	Among Bitcoin beginners, financial literacy and the usability of the product contribute to the overall user experience

(continued)

Table 1.

Authors	Year	Country/region	Method	Theoretical foundation	Findings
Ermakova <i>et al.</i>	2017	Germany, Austria, Switzerland, the UK, the USA and Israel	Quantitative	IDT	Adoption drivers are anonymity, no intermediaries, lower fees, worldwide usage, flexibility, transparency, and no central control. Among the barriers are vulnerability, deflation, inaccessibility, volatility, political regulations and restrictions, lack of trust, low acceptance, and irreversibility
Sas and Khairuddin	2017	Malaysia	Qualitative	HCI	The findings showed that Bitcoin is used primarily to store value for speculative investment or savings' protection

Table 1.

rejection of technology (Pires and Halawi, 2020). Taylor and Todd (1995) created the C-TAM-TPB hypothesis, which combines the TAM and Theory of Planned Behaviour (TPB) theories to predict attitudes based on behaviours (Safeena *et al.*, 2013). The TAM model was fully developed into the Unified Theory of Acceptance and Use of Technology (UTAUT) model by (Venkatesh *et al.*, 2003), who proposed four fundamental constructs: social impact, enabling factors, performance expectation and effort expectancy.

The goals driving technology adoption have been studied using the TAM, UTAUT and TPB theories and Social Cognitive Theory (SCT) (Gao and Waechter, 2015). Some researchers assert that although these ideas may assist to explain the early adoption of a technology or information system, they are not especially suitable for understanding consumers' ongoing use (Gupta and Manrai, 2019). To comprehend continuous intention behaviours, new and more suitable representations and conceptions are required (Nabavi *et al.*, 2016).

In order to provide a comprehensive viewpoint on consumers' adoption of information technology, the first iteration of UTAUT was developed in 2003. The performance expectation, effort expectancy, social influence and enabling circumstances are the four fundamental characteristics that make up the UTAUT model that affect BIs and the usage of technology. Moderators like age, gender, experience and voluntariness of usage moderate these dimensions. Since the UTAUT model was created, the rapid development of information technology has made it necessary to broaden the theoretical scope and functionality of UTAUT to accommodate new technologies. Venkatesh *et al.* (2012) suggested an enhanced version of UTAUT, known as UTAUT2, based on the prior model in order to precisely explore the adoption and usage of technology in the context of mobile apps from a consumer viewpoint.

In a longitudinal research, UTAUT accounted for 52% of actual usage and 77% of BI changes (Venkatesh *et al.*, 2012). UTAUT was created particularly for use in organisational environments, much as TAM and IDT were (Rondan-Cataluña *et al.*, 2015). Hedonic incentive, price value and habit were included to UTAUT2 in 2012 to address the consumer environment (Venkatesh *et al.*, 2012). These new characteristics may have a direct or indirect impact on BI and consumption. According to UTAUT2, BIs and the usage of technology have an impact on corporate performance and social influence depending on the effort expectation, performance expectation and social influence.

In contrast, the purposes of such behaviours, together with any enabling circumstances, might influence how technology is used (Usman, 2017). In conclusion, UTAUT2 is one of the few approaches for the introduction of technologies that is consumer-focussed. Its originality and lack of independent testing of its use in various situations or for alternative technologies, however, represent a shortcoming of the concept (Mahomed, 2017).

3.1 Perceived risk

Exchanges of money are social agreements built on trust. The negative effects of consumer behaviour, according to Bauer (1960) and Ostlund (1974), give rise to a crucial and well-established concept: PR. Wu *et al.* (2017) observed that customers' positive emotions significantly lowered users' perceptions of risk and were positively associated to the perceived utility of m-payment. Many writers have looked at and analysed the influence of risk on online banking adoption.

Bitcoin and other cryptocurrencies were purposefully created by Nakamoto (2008) to eliminate the need for third-party trust providers. Technical systems, governance, communications, reputation, fraud and insurance costs are added to transactions to ensure that good intentions prevail when transactions are made through a communication channel like the Internet because intermediaries must ensure system integrity and mediate between various parties (Nakamoto, 2008). Therefore, the system can theoretically execute the transaction even in the absence of reliable middlemen.

PR is a fundamentally new framework for forecasting behaviour and an essential aspect of institutions in developing countries (Penfold, 2015). While public institutional trust has decreased in affluent nations, it is a systemic issue in developing economies (United Nations, 2021). Therefore, PR may directly affect the uptake of cryptocurrencies, necessitating more thorough research. In personal money and online transactions, PR is crucial. Uncertainty and negative PR might come from a lack of confidentiality and social signals often associated with private transactions (Yan and Pan, 2015; Zhou, 2012). To be clear, PR is a view about one's own susceptibility to dangers, while trust is confidence in another person (Luo *et al.*, 2010). Koenig-Lewis *et al.* (2015) utilised PR to support earlier studies demonstrating the significance of security in financial services. Gefen *et al.* (2003) found that trust, coupled with perceived usability and utility, is a significant determinant in e-commerce purchases. According to Hossain and Zhou (2018), trust has a big influence on BI. Yan and Pan (2015) found that PR impacts BI, perceived usability and utility influences trust, and structural security has the most impact on all three. This supported earlier research by Zhou (2012), who discovered that structural assurances had the greatest influence on preliminary trust in mobile banking. PR may rise as a consequence of consumer complications brought on by several providers and the variety of separate technologies used in utilising cryptocurrency (Slade *et al.*, 2013). Price stability is tied to PR and trust, and the former has been noted as a barrier to the widespread adoption of cryptocurrencies (Haran, 2017; Penfold, 2015).

Since perceived risk is critical for user acceptance, as evidenced by the advent of mobile banking, it is essential to comprehend the function that PR plays in the adoption and usage of cryptocurrencies (Alalwan *et al.*, 2017).

3.2 Innovation

According to IDT (Rogers, 1995), people's inclination to innovate impacts the information sources they take into account when selecting whether to embrace technology. IDT obviously depends on innovation, and many scholars have offered definitions in different study disciplines. The innovative capability was described by Rogers and Shoemaker (1971)

as the extent to which a person absorbs novel concepts before other members of the social system. According to [Midgley and Dowling \(1978\)](#), the degree to which people are open to new ideas and make innovative choices without reference to the experiences of others is a key indicator of innovation. According to [Hurt et al. \(1977\)](#), innovation is the propensity towards change. Innovation was described by [Agarwal and Prasad \(1998\)](#) as the willingness of a person to experiment with new information technology. Since innovation impacts the history and outcomes of views about a given system, more researchers are using innovation as both an independent variable and a moderator in their study models ([Agarwal and Prasad, 1998](#); [San Martín and Herrero, 2012](#)). [Agarwal and Prasad \(1998\)](#) found that under the same informational circumstances, inventive individuals construct more favourable views of an innovation's qualities. According to several studies, CI affects cognitive and decision-making processes ([Gatignon and Robertson, 1985](#); [Rogers, 1995](#)). Information technology innovation has been noted by [Agarwal and Prasad \(1998\)](#) and [Dabholkar and Bagozzi \(2002\)](#) as a moderator variable for the development and effects of views regarding a certain system.

3.3 Research propositions

After reviewing the existing cryptocurrency literature, we decided that, with minor adjustments, the prior study on mobile banking acceptability done by [Alalwan et al. \(2017\)](#) was the most applicable research on which to base this study. The CI construct taken from IDT, the PR construct created by [Gefen et al. \(2005\)](#), and the original UTAUT2 idea created by [Venkatesh et al. \(2012\)](#) served as the foundation for the study that followed. This choice was made since the first UTAUT2 instrument had previously shown concept and item validity. Given the ambiguity and danger surrounding cryptocurrencies in Malaysia, the extra predictor of trust was deemed crucial ([Omane-Adjepong and Alagidede, 2020](#); [Zakaria et al., 2019](#)). However, the original UTAUT2 model's structures were not used in this work. According to [Alalwan et al. \(2017\)](#) and [Koenig-Lewis et al. \(2015\)](#), adding more concepts to the study's conceptual framework would simply make the research instrument more complex. Therefore, based on the assumption that cryptocurrency is still in its infancy, most of the original elements from UTAUT2 were omitted from our study model. Researchers have further claimed that CI should be considered in studies since creative persons are likelier to take risks while using technology ([Oliveira et al., 2016](#)).

We took into account the moderating effects of age and gender in contrast to [Alalwan et al. \(2017\)](#) and based on the original conceptual model created by [Venkatesh et al. \(2012\)](#), however, since we anticipated limited sample size, researching age and gender was unlikely to be feasible. The analytical method afterwards outlined was used to ascertain how much the ideas identified in the literature impacted the connections between the constructs. As a result, causation was not clearly investigated in relation to, say, how PR affects BI. It should be highlighted that statistical methods alone cannot be used to study causation ([Kline, 2011](#)). The following hypotheses are supported by statistical testing and are based on prior research utilising UTAUT2 and its predecessors.

3.4 Hypotheses

[Godoe and Johansen \(2012\)](#) showed that innovation positively affects attitudes towards usability and perceived usefulness regarding a specific technology. Therefore, this personal factor has a beneficial influence on people's preparedness for bitcoin technology and motivates them to utilise it ([Sohaib et al., 2020](#)).

Following IDT, this study assumed that the ability to innovate would be the best indicator of intentions to use cryptocurrencies as transfer instruments, based on the following hypothesis regarding the moderating influence of the ability to innovate on the choice of transfer:

H1. CI positively affects BI.

The nature of financial technology is such that PR is a big influence in mobile banking and online commerce (Alalwan *et al.*, 2017; Gefen *et al.*, 2005; Yan and Pan, 2015; Zhou, 2012). This is because the mainstreaming of cryptocurrencies has resulted in a number of controversies. Therefore, PR should have a detrimental impact on plans to adopt cryptocurrency. However, since the study concentrated on general processes rather than the PR construct explicitly, this research ignored potential predecessors and treated PR as a unitary construct:

H2. PR negatively influences consumers' BIs.

When customers brave trying new items, they are constrained by a choice between the positive and negative effects of the introduction and must thus take a chance (Mitchell *et al.*, 1999; Zinkhan and Karande, 1991). PR thus depends on adoption's unforeseen results, which may diverge from predictions (Forsythe and Shi, 2003; Weber and Hsee, 1998). Although some studies have shown that PR may adversely impact choices to launch new goods (Anser *et al.*, 2020; Conchar *et al.*, 2004; Hwang and Moon, 2019; Mendoza-Tello *et al.*, 2019; Yoo *et al.*, 2020), others have countered that this adverse effect is limited (Arias-Oliva *et al.*, 2021; DelVecchio and Smith, 2005; Ermakova *et al.*, 2017; Mitchell and Harris, 2005). PR may not have much to do with real adoption since actual uptake depends on consumers' (global and domain-specific) capacity for innovation. However, this can prompt customers to look for further information in order to assess the risk involved and minimise or control PR (Manning *et al.*, 1995):

H3. CI mediates the relationship between PR and BI.

The conceptual model provided below is based on the aforementioned assumptions (see Figure 3).

4. Materials and methods

4.1 Methodology

Our research's design was informed by the market's recent introduction of cryptocurrencies. We required a more targeted strategy since the broad customer base is not very aware of cryptocurrency. Additionally, because of the complexity of the underlying technology, it is difficult to describe the distinctive features of cryptocurrencies, which might have an impact on the quality of the data. For these reasons, the study design took this into account.

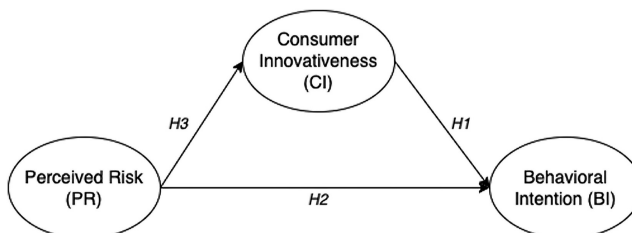


Figure 3.
A conceptual
framework for research
on cryptocurrency
adoption

We used a quantitative deductive method to investigate the UTAUT2 (Venkatesh *et al.*, 2012) adoption theory about the connections between BIs and bitcoin use. Based on the data gathered, we also sought to explain why cryptocurrency consumers accepted it, making the research an explanatory one (Saunders and Lewis, 2018).

The study method we used was an electronic survey. Because of the pseudo-anonymous technical design, it was impossible to quantify the usage of cryptocurrencies directly (Bohr and Bashir, 2014). As a result, questionnaires with self-reported values were acceptable. The survey's length and complexity had a significant impact on the quantity and quality of responses. To make sure the survey's content was reliable for evaluating the aforementioned assumptions, it was piloted with a small sample of bitcoin users.

We further restricted the sample to those who had some familiarity with cryptocurrencies, the most well-known of which is Bitcoin. The population was further restricted to Internet users since bitcoins are an online technology. One may argue that this made the study less applicable to online shoppers who could make use of bitcoins as a payment option. However, expanding the sample size would have complicated the findings (i.e. adoption of Internet technologies versus adoption of cryptocurrencies). In addition, people who wanted to use or had used cryptocurrency would be Internet users owing to the nature of the technology. The study questions naturally led to the need for cryptocurrency knowledge (i.e. regarding the influencing variables that drive acceptance, intended use and use). A single respondent also served as the unit of analysis since we focussed on customers.

A non-probability technique called snowball sampling utilises the names of previous responders to find new ones (Saunders and Lewis, 2018). Snowball samples are appropriate for populations when it is difficult to distinguish the sample units. This is accurate for cryptocurrency users owing to the technology's anonymity. There are no open user databases, and getting access to private databases is quite difficult. Additionally, it's thought that true bitcoin users are a small group of early adopters. Social impact mechanisms suggest a network effect among early adopters in adoption research, which further reinforces the suitability of snowball sampling. Potential users, the second group under investigation, made an excellent snowball sample. Building a large enough network of websites and online communities to promote the poll on cryptocurrency websites was another way to get the desired reach. However, there is no assurance that this would provide a representative sample of current and future users, which might result in expensive expenses. Given how simple it is to disseminate electronic surveys, the decision to use snowball sampling was also related to the electronic survey technique. Potential selection bias among the early responses, which results in a homogenous sample, is one of the drawbacks of snowball sampling.

4.2 Population and sample size

There were at least 20 replies for each condition in the survey's sample size (Wegner, 2016). Additionally, using the structural equation modelling method, we needed a 20:1 sample to data ratio to estimate interactions (Osborne and Costello, 2004). This required a sample size of 60 replies since we were testing three hypotheses. We adjusted the intended sample size to 100 in order to take into consideration possibly useless situations. Based on research by Albayati *et al.* (2020), Alqaryouti *et al.* (2020a), Anser *et al.* (2020), Arias-Oliva *et al.* (2021) and Gil-Cordero *et al.* (2020), the predicted response rate was calculated (2020). Consequently, we cautiously predicted a response rate of 20%. It was necessary to contact 500 respondents in order to have a minimum sample size of 100 replies. Due to time restrictions, this objective was selected and based on prior research of a similar kind.

4.3 Survey design

The survey questionnaire was used, which was translated into both English and Arabic. The Arabic version of the survey is based on the English translation and cross-translation to English to ensure uniformity with original constructs. All items were measured on a 5-point Likert scale ranging from 1 to 5 (strongly disagree to strongly agree). To measure PR, we used a four items-scale developed by [Lee \(2009\)](#) and used before by [Gefen et al. \(2003\)](#). The items rated on this scale included four dimensions of the perceived risk: legal framework, volatility, attacks of illegal activities and cryptographic failures. We adopted a four-item scale developed by [Agarwal and Prasad \(1998\)](#) to measure CI. The BI construct was measured with a four items-scale developed by [Venkatesh et al. \(2012\)](#).

The study adopted a development approach to validate the survey scales, initially based on the literature review. The study validated the scale through semi-structured interviews with top/mid-level employees of two cryptocurrency firms in the UAE. Considering the literature, this was essential for developing the scale items to measure the dimensions of cryptocurrency adoption.

We conducted a pilot study with four remittance users, having been asked about their familiarity with Bitcoin, who periodically employed remittances to transfer funds to their own countries. The survey was shared with them to collect preliminary results, and the results and feedback received during the completion of the survey contributed to the finalisation of the survey scale.

This study, therefore, adopted [Venkatesh et al.'s \(2012\)](#) tool but added trust as a variable, according to [Alalwan et al. \(2017\)](#). This modification was partially inspired by [Schuh and Shy's \(2016\)](#) insights and observations on the challenges of comprehending surveys while working with cryptocurrency.

The measured variables are summarised in [Table 2](#), and the actual survey is covered in the next section. Even if certain factors, such as demographics, weren't explicitly employed in the suggested model, they were nonetheless crucial to the research. As a result, some of these data were gathered, but not all.

Constructs	Items	Sources
Perceived risk (PR)	PR1	I think it is risky to use cryptocurrencies without any legal framework to back them up I think it is dangerous to use cryptocurrencies because they are volatile I think it is risky to use cryptocurrencies because of attacks and illegal activities I consider the use of cryptocurrencies risky due to cryptographic failures in electronic devices Lee (2009), Gefen et al. (2003)
	PR2	
	PR3	
	PR4	
Consumer innovation (CI)	CI1	If I heard about new cryptocurrency information technology, I would look for ways to experiment with it Among my peers, I am the first to try out new information technologies In general, I am not hesitant about trying out new information technologies I like to experiment with new technologies Agarwal and Prasad (1998)
	CI2	
	CI3	
	CI4	
Behavioural intention (BI)	BI1	I intend to use cryptocurrencies in the future I plan to use cryptocurrencies for remittances in the future I currently prefer to use cryptocurrencies for my remittances If a cryptocurrency was not available as a payment method for a remittance, I would request it Venkatesh et al. (2012)
	BI2	
	B3	
	B4	

Table 2.
Measurement items

5. Results

5.1 Descriptive analysis

We used the SurveyMonkey survey administration platform to collect data, and we analysed the data using IBM® SPSS® AMOS software (version 26). Table 3 describes the respondents' demographics.

5.2 Measures of reliability

During the screening phase of the analysis, we noticed no missing values among the collected data. However, we removed three cases due to a lack of engagement (the respondents answered "somewhat agree" to every item). We registered no outliers and no missing data in the columns. For our latent skewness factor indicators, we found a very normal distribution. On the other hand, the indicators of our independent variable (Bi) showed modest kurtosis, with values ranging from tolerable 0 to -1.6. Although this broke the rigorous norms of normalcy, it fell within the more flexible guidelines provided by Sposito *et al.* (1983), who chose 3.3 as the normality upper limit. Due to the low loading for the reliability analysis of the single dimension during the exploratory study, we deleted the CI1 skill item. No significant cross-loadings were found. Except for one subscale (CI, 0.759), the reliability scores for each of the measures utilised in this investigation all fell below the acceptable range, as shown in Table 4. This could be explained by the limited sample size, non-heterogeneous sample and restricted measurement scale (Spiliotopoulou, 2009).

The adequacy of the model was more than acceptable. The Kaiser-Meyer-Olkin Measure (KMO) and Bartlett's tests gave a value of 0.775, with a chi-squared value of 1382.7 and a Degree of Freedom (DF) of 55, which was statistically significant.

5.3 Correlations

Bivariate correlation analysis (Pearson's *R*; see Table 5) was used to assess the strength of the correlations between PR, CI and BI. The findings supported some of the earlier research that found PR had a detrimental impact on people using bitcoin goods, showing a negative link between PR and BI (Abbasi *et al.*, 2021; Albayati *et al.*, 2020; Nadeem *et al.*, 2021; Saif

Demographic variables	Items	%
<i>Gender</i>		
Female	83	31
Male	181	67.5
I prefer not to say	4	1.5
<i>Age (years)</i>		
18–29	79	29.5
30–44	131	48.9
45–59	55	20.5
60+	3	1.1
<i>Nationality</i>		
UAE National	75	28
Non-UAE National	193	72
<i>Education level</i>		
High school/college diploma	33	12.3
Bachelor's degree	90	33.6
Master's degree	132	49.3
PhD/DBA/equivalent	13	4.9

Table 3.
Descriptive analysis

Almuraqab, 2020). But whereas there was practically no link between PR and CI, there was a greater than moderate relationship between CI and BI.

5.4 Structural model assessment

Before testing the structural model, we checked its fitness. The goodness-of-fit results obtained from SPSS[®] Amos 28 included a Bentler-Bonett Normed Fit Index (NFI) value of 0.955, which fell below the recommended value of 0.95. However, the Standardised Root Mean Square Residual (SRMR) value was 0.048, which was considered acceptable by Hu and Bentler (1999). Hence, the model was considered to have a good fit (see Table 6).

5.5 Hypothesis testing

We used regression coefficients as indicators of whether the contribution of each variable was significant, which further tested the validity of the hypotheses. The variance indicated the overall contribution of the variables explained (R²) and, thus, the explanatory power of the variables.

H1 projected that CI and BIs would have a favourable association. The findings indicated that CI only explained 16.8% of the variation in BI, leaving 83.2% of the variance in BI unaccounted for (Table 7). The effect of CI on BI, however, was substantial at 0.000. H1 was thus supported.

H2 predicted a negative relationship between PR and BI. The results showed that PR explained 5.4% of the variance in BI, with a statistically significant prediction of $\beta = -0.233$. Hence, H2 was supported.

We set a standard for quantifying mediation in this study before testing for it. If the independent variable explains a certain variation in the mediator variable, which should also

Construct	Cronbach's alpha	Table 4. Reliability of the constructs
PR	0.871	
CI	0.837	
BI	0.759	

Construct	A (PR)	B (CI)	C (BI)	Table 5. Correlations between constructs
A (PR)	1			
B (CI)	-0.183**	1		
C (BI)	-0.233**	0.409**	1	

Note(s): ** Correlation is significant at the 0.01 level (2-tailed)

Measure	Estimate	Threshold	Interpretation	Table 6. Model fit measures
CMIN	63.646	—	—	
DF	39.000	—	—	
CMIN/DF	1.632	1–3	Excellent	
CFI	0.982	>0.95	Excellent	
SRMR	0.048	<0.08	Excellent	
RMSEA	0.049	<0.06	Excellent	
PClose	0.513	>0.05	Excellent	

explain the variance in the dependent variable, then it is thought that mediation has taken place. [Baron and Kenny \(1986\)](#) and [Baron and Kenny \(1986\)](#) claim that mediation takes place when the following circumstances are true:

- (1) The assumed mediator's variance is largely explained by variations in the independent variable.
- (2) The dependent variable's variance is largely explained by variations in the mediator.
- (3) The dependent variable's variance is largely explained by variations in the independent variable.

According to [H3](#), CI mediates the connection between PR and BI. According to the findings, when CI was included as a mediator, PR marginally rose to 19.3%, and there was a statistically significant influence on BI (0.0038) as a consequence. As a result, [H2](#) was supported and CI moderated the link between PR and BI.

6. Discussion

This study examines the usage of cryptocurrencies for UAE remittance transactions with the goal of better understanding BIs by taking into account the interactions between PR and BI with CI acting as a mediator. We used a cross-sectional web-based survey to collect data using a snowball method, guided by the study questions. Using the scales given in [Table 3](#), the 12-item questionnaire examined individual-level perceptions pertaining to the three variables PR, CI and BI. We gathered information from 270 users from several UAE communities. The average age of the respondents, who made up the bulk of the sample (67.5%), was between 30 and 44. To answer the study questions, numerous data analysis methodologies were used.

New product purchase intentions relate to actual innovation or adoption behaviours and can be represented by the new products consumers currently own or intend to own shortly ([Morton et al., 2016](#)). This is termed product-obsessed innovation ability, which refers to the predisposition of innovators or early adopters to adopt new products earlier than late consumers or latecomers ([Jeong et al., 2017](#)). Regarding the UAE population, according to [Al-Jundi et al. \(2019\)](#), there is a proven link between innate CI and purchase intentions for new products.

One of the topics covered in earlier bitcoin research is that CI has a favourable connection with BI, correlating with the findings in the literature ([Sohaib et al., 2020](#)). CI refers to people's drive to break new ground in the technology field ([Parasuraman, 2016](#)). Innovative shoppers take chances and explore new avenues ([Connolly and Kick, 2015](#)). Thus, the adoption of bitcoin technology is favourably impacted by this particular factor, increasing customer interest ([Sohaib et al., 2020](#)). CI was shown to be a construct that significantly predicted intents to utilise cryptocurrencies ($p = 0.409$). These results support those of earlier research by [Albayati et al. \(2020\)](#), [Hemantha \(2021\)](#), [Hirunyawipada and Paswan \(2006\)](#), [Shaw and Sergueeva \(2019\)](#), [Sun et al. \(2021\)](#) and [Thakur and Srivastava \(2014\)](#).

According to this research, PR, which allegedly causes resistance to adopting innovations ($R^2 = 0.183$ with CI), has a considerable influence on this as well. The literature claims that PR

Table 7.
Regression test results
and mediation analysis

Hypotheses	R^2	β	Significance	Supported?
H1 (CI→BI)	0.168	0.409	0.000	Yes
H2 (PR→BI)	0.054	-0.233	0.000b	Yes
H3 (PR + CI→BI)	0.193	-0.1833	0.0038	Yes

has a draw power that prevents customers from adopting new products because newness breeds uncertainty (Hirunyawipada and Paswan, 2006). According to the study's findings, CI has a mediating effect for UAE consumers between PR and BI, which lessens the detrimental impact of PR on BI.

7. Conclusion

This paper elaborates on the challenges to cryptocurrency use in the UAE remittance market. We investigated the impact of PR on BI while introducing CI as a mediator. Based on the results, we conclude that although PR has an impact on BI to use cryptocurrencies for remittances, CI is sufficient by itself to promote intentions to use cryptocurrencies. Consequently, this study offers the following advice to practitioners.

Cryptocurrency platform providers need to stimulate innovation among customers. This can be accomplished by offering information search facilities on cryptocurrency platforms to increase customers' interest since innovation is positively linked to product information searches (Chauhan *et al.*, 2022).

Reducing risk should be a primary goal for service providers and developers since PR is the main reason why customers are worried about adopting cryptocurrencies, as was shown in the present study. By concentrating on risk-reduction techniques and procedures, they may lessen the risk involved with bitcoin transactions. Three different sorts of risk-reduction methods are suggested by the current research to lessen the danger faced by adopters: (1) providers must implement appropriate security measures for their cryptocurrency platforms, particularly for custodians or non-custodial wallets; (2) providers must create trust-building strategies or mechanisms by introducing trust certification for third parties, like Payment Card Industry (PCI) certification, and promptly addressing complaints in order to increase customer satisfaction and trust (Khairuddin *et al.*, 2016; Mendoza-Tello *et al.*, 2019; Sas and Khairuddin, 2017; Voskoboynikov *et al.*, 2021). It was discovered that PR was significantly impacted negatively by the accessibility of security information (Chauhan *et al.*, 2022).

By facilitating safe and convenient remittance transactions, this paper fills a gap in the literature about cryptocurrency adoption in the UAE. It serves as a valuable resource for policymakers and practitioners looking to adopt appropriate measures to reduce barriers to the adoption of cryptocurrency platforms. Additionally, those who support cryptocurrencies and are working to improve the remittance business would find this article helpful.

7.1 Limitations and future directions

This research contains various constraints that would allow for a wider scope of the investigation, as is typical of all research studies:

- (1) Limited sample size: Future research might examine how the findings change when there are significantly more respondents, or it could examine a particular sample moderator such as age, gender, experience and voluntariness of usage.
- (2) Data from a single nation: Future study may contrast these findings with those in industrialised nations to generate solutions tailored to certain markets.
- (3) Cross-sectional research: Future studies may use a mixed-methods approach to get a deeper understanding of the problems with bitcoin adoption.
- (4) Lack of dedication: Future study should look at how successfully blockchain and cryptocurrency activities are incorporated into UAE organisations.

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About the authors

Devid Jegerson is Practitioner and Doctoral Candidate at the College of Business, Abu Dhabi University. He holds an MBA from MIP Politecnico di Milano (Italy) and a master's degree in Market Strategy from Università Cattolica di Milano (Italy). His research interests are business strategy, business management and technology. He is Executive Vice President, Head of Customer Experience and Platform Development, for the National Bank of Fujairah. Devid Jegerson is the corresponding author and can be contacted at: djegerson@gmail.com

Dr Mehmood Khan is Professor of management at University of Sharjah and has served as Director of the Center of Excellence in Sustainable Business Processes at Abu Dhabi University. He holds a Ph.D. in Industrial Engineering from Ryerson University, Canada. He has taught various courses in operations research/management and supply chain management at King Fahd University, Saudi Arabia; Brock University, Canada; and Ryerson University, Canada. His research interests span the role of technology, the Internet of Things, quality control and sustainable supply chains. His work has been published in various top-ranked journals.

Dr Charilaos Mertzanis is Professor of finance at Abu Dhabi University. His current research interests are mainly the role of institutions in financial decision-making across countries, crises, institutional determinants of tourist flows, energy flows and international financial transactions. His work has been presented at various international conferences and peer-reviewed journals, such as the *Journal of Economic Behavior and Organization*, *Journal of Banking and Finance*, *Energy*, *Corporate Governance: An International Review* and *Cambridge Journal of Economics*.