

Consumer adoption of cryptocurrencies as a precursor to a decentralized financial system: a push-pull-mooring model

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**Consumer Adoption of Cryptocurrencies as a Precursor to a
Decentralized Financial System: A Push-Pull-Mooring Model**

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Consumer Adoption of Cryptocurrencies as a Precursor to a Decentralized Financial System: A Push-Pull-Mooring Model

Abstract

Purpose: Consumer adoption of decentralized blockchain solutions, such as Decentralized Finance (DeFi) applications, has demonstrated considerable technological promise. However, to benefit from DeFi applications, consumers must purchase and own cryptocurrencies, which is a potential obstacle to adopting decentralized blockchain technology. This study employed a push-pull-mooring model to examine factors influencing individuals' willingness to use cryptocurrencies. In particular, how push (i.e., diminishing value and pricing problems), pull (i.e., relative security and perceived value), and mooring (i.e., switching cost and personal innovativeness) factors shape individuals' switching intentions.

Design/ methodology/ approach: Three hundred valid responses were collected via an online survey and analyzed using partial least squares structural equation modeling (PLS-SEM).

Findings: The results confirm that the factors of push (i.e., pricing problem and low perceived value of traditional fiat money), pull (i.e., relative security and perceived value of cryptocurrency), and mooring (i.e., switching cost and personal innovativeness in technology) significantly impact switching intention to cryptocurrency. These findings offer key insights and implications for consumer adoption of cryptocurrencies as a precursor to participating in decentralized blockchain ecosystems.

Originality: Cryptocurrencies have been associated with numerous risk and security concerns, potentially holding back consumer adoption of DeFi financial solutions. Accordingly, this paper contributes to extending the knowledge of consumer adoption of cryptocurrency, switching from traditional money to using cryptocurrencies based on the push-pull-mooring theory (PPM). This allows for a detailed analysis of the critical factors that hinder or promote consumers' adoption of decentralized blockchain solutions.

Keywords: Adoption, Decentralized Finance (DeFi), Blockchain Technology, Push-pull mooring model, Cryptocurrency

Consumer Adoption of Cryptocurrencies as a Precursor to a Decentralized Financial System: A Push-Pull-Mooring Model

Introduction

The inception of Bitcoin (BTC) in 2008, as outlined in the seminal Nakamoto whitepaper, marked the beginning of widespread interest in blockchain as a decentralized and permissionless ledger technology capable of operating independently from centralized authority, corporate governance, or governmental support (Nakamoto, 2008; Ryu, 2024; Voshmgir, 2019; White *et al.*, 2020). Over the years, blockchain has not only facilitated the creation of cryptocurrencies but also spearheaded innovations in decentralized finance (DeFi), including the potential to transform some aspects of the financial system. Among other items, this includes the potential of decentralized governance capabilities and enhancement of trust in the financial system, in addition to the benefits of increasing transparency (via open blockchain technology), transaction speeds, and reducing costs. These innovations are particularly beneficial in developing countries and underbanked regions of the world (Ozili, 2022).

The ownership and adoption of cryptocurrencies (or tokens) grants users access to DeFi platforms, such as facilitating interactions with smart contracts (Jonker, 2019). Cryptocurrency ownership also allows users to participate in the governance of decentralized communities, including voting rights on platform governance and development. Additionally, users can supply liquidity or engage in yield farming to earn returns, enhancing their investment opportunities. This direct involvement can facilitate enhanced control over assets and personal data, aligning with DeFi's principles of decentralization and financial self-sovereignty while reducing consumer reliance on centralized financial systems (McFarland 2021).

As the adoption of cryptocurrencies varies from country to country, it is crucial to address the context of this study. Attitudes towards cryptocurrencies in the United States are marked by a complex interplay of political and social factors. Politically, the cryptocurrency landscape is complex. This includes regulatory bodies grappling with how to oversee this emerging financial sector, with different agencies vying for control (Jackson-Hill, 2022). This is part of an ongoing political debate over cryptocurrency regulation in Washington, reflecting broader discussions about financial innovation and consumer protection (Novak 2020). These social and political contexts create a

dynamic environment where attitudes towards cryptocurrencies are continually evolving, shaped by a mix of technological enthusiasm, regulatory concerns, and changing market conditions.

Problematically, cryptocurrencies have been associated with numerous risk and security concerns, potentially holding back consumer adoption of DeFi financial solutions. Echoing back to Ngau et al.'s (2023) systematic review on bank customer switching, this study aims to investigate factors influencing consumers to, in part, switch from traditional money to owning and using cryptocurrencies based on the push-pull-mooring theory (PPM). The primary objectives of this research are to identify and analyze the push factors that drive consumers away from traditional fiat currencies, assess the pull factors that attract them to cryptocurrencies, and evaluate how personal mooring factors influence their switching intentions. Furthermore, this study seeks to provide actionable insights that can guide the development of DeFi solutions tailored to consumer needs. This allows for a detailed analysis of the critical factors that hinder or promote consumers' adoption of decentralized blockchain solutions (Bansal *et al.*, 2005; Cao *et al.*, 2020; Loh *et al.*, 2021; Sun *et al.*, 2017). This investigation builds upon more general factors, such as dissatisfaction as the push factor and alternative attractiveness as the pull factor in previous studies (Chang *et al.*, 2014; Hou *et al.*, 2011; Hou and Shiau, 2020; Sun *et al.*, 2017). The findings may be used to guide the future development of DeFi solutions and identify pain points in the traditional financial system. We begin the article by examining the theoretical background, followed by our empirical investigation. We will end the article by considering the implications of theory and practice and directions for future research.

Theoretical Background

Push-pull-mooring (PPM)

Many scholars have employed the Technology Acceptance Model (TAM) to examine positive factors (i.e., perceived usefulness and perceived ease of use) in individual intention to adopt online banking (Pikkarainen et al., 2004), online shopping (Aldás-Manzano et al., 2009), mobile applications (Rafique et al., 2020), social network websites (Braun, 2013) and mobile payments (Bailey et al., 2017). While TAM focuses on the direct factors influencing individuals' adoption intention, personal and situational factors may also play an essential role in the adoption behavior. As Chen and Chan (2011) commented, using only the Technology Acceptance Model to examine

individuals' adoption behaviors is insufficient. Additional variables combined with the TAM model are required to understand adoption behaviors better. Hence, based on PPM theory, this study employs a three-dimensional framework to examine the interactions between positive (i.e., pull), negative (i.e., push), and person-specific mooring factors influencing individuals' adoption of cryptocurrencies.

The Push-Pull-Mooring (PPM) framework, originating from international migration studies, has been applied to elucidate the rationales of individuals' switching behavior in consumer research, such as switching behavior from a product or service (Bansal *et al.*, 2005; Loh *et al.*, 2021). Previous studies show that the PPM framework has demonstrated strong predictive power in the marketing, tourism, and information system disciplines. For example, the PPM framework has been widely applied to examine consumer online switching behavior in mobile payments (Loh *et al.*, 2021), e-commerce (Susanty *et al.*, 2020), social networking sites (Chang *et al.*, 2014; Cao *et al.*, 2020; Hsieh *et al.*, 2012; Hou and Shiau, 2020; Tang and Chen, 2020), mobile instant messaging (Sun *et al.*, 2017), online video games (Hsieh *et al.*, 2011), and online banking (Yoon and Lim, 2021). Hence, the PPM framework is an appropriate model for analyzing online switching behavior in contemporary financial systems such as blockchain and cryptocurrencies. Table 1 summarizes prior research on online switching behavior in different research contexts with various constructs under the PPM framework. While studies on switching technology alternatives are prolific, empirical research on the switching behavior of cryptocurrency still needs to be explored. Thus, this study adopts the push-pull-mooring framework (PPM) to examine consumers' cryptocurrency switching behaviors.

The PPM framework has three dimensions: macro-level negative (push factors), positive (pull factors), and more personal micro factors (mooring) that can influence switching decisions either way. Examining these three dimensions will gain better insights into the motivations for users' migration decisions from using traditional fiat money to adopting cryptocurrencies in this study. **Switching intention** refers to consumers' voluntary decision to swap products or services that are currently used for other alternatives that are preferable to them (Ganesh *et al.*, 2000). **Push factors** have negative effects associated with limitations of products or services that customers currently use. In this study, recognizing the disadvantages (i.e., push factors) of using traditional fiat money, customers are motivated to search for an alternative option to fulfill their needs.

On the other hand, ***pull factors*** have positive effects that highlight the benefits of the alternative option and draw customers to a new opportunity. In the context of cryptocurrencies, their perceived value and relative security and control offer perceived psychological benefits for consumers and induce their willingness to switch to cryptocurrencies. Apart from the push and pull factors, there are variations in customers' switching decisions due to mooring effects. While push and pull factors concern macro-level variables, ***mooring effects*** refer to personal or situational factors that hinder or promote customers' switching behaviors (Moon, 1995). Person-specific mooring factors (e.g., technology savvy) and situational constraints (e.g., switching barriers) may enable or prevent individuals' willingness to adopt cryptocurrencies in the complex decision-making process.

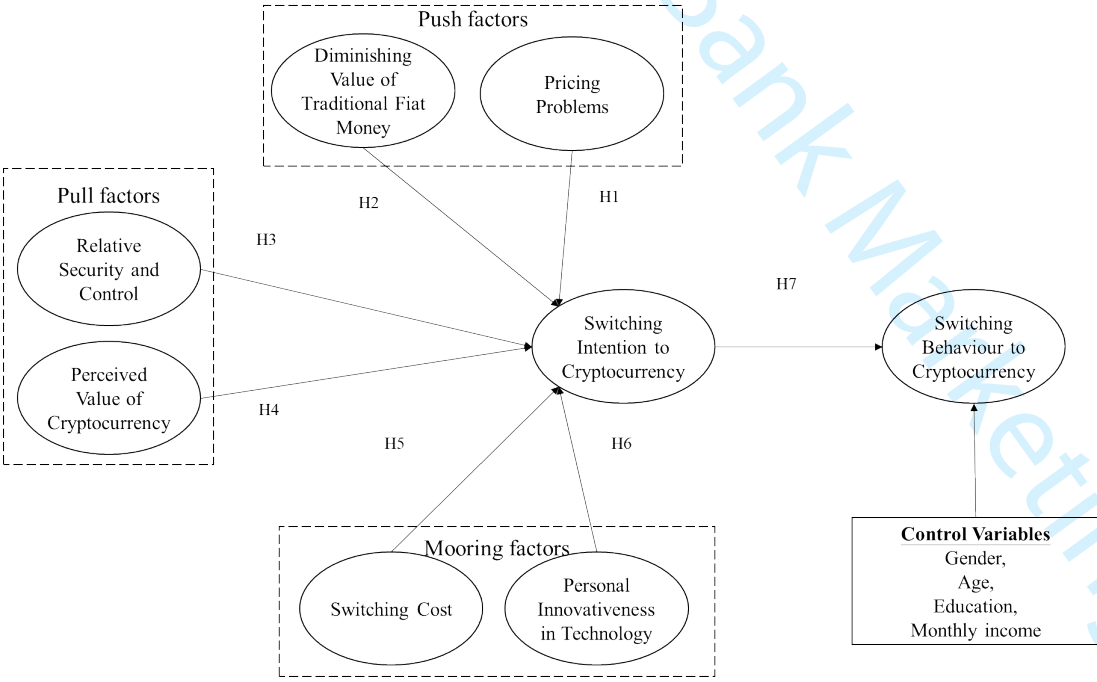
Authors	Push effect	Pull effect	Mooring effect	DV	Research Context
Chang <i>et al.</i> (2014)	Dissatisfaction, Regret	Alternative Attractiveness	Switching cost	S.I.	Social networking sites
Cao <i>et al.</i> (2020)	Social presence	Referent network size, Relative ease of use	Affective commitment, Switching costs, Habit	SI	Bloggers' switching toward microblogging
Hsieh <i>et al.</i> (2012)	Weak connection, Writing anxiety	Enjoyment, Relative usefulness, Relative ease of use	Switching costs Past experience	S.B.	Blogging service
Hou <i>et al.</i> (2011)	Low enjoyment, Low satisfaction, Perceptions of insufficient participants	Alternative Attractiveness	Switching costs, Social relationship, Need for variety Prior switching experience	S.I.	Online game service
Hou and Shiau (2020)	Enjoyment, Satisfaction, System quality	Alternative Attractiveness, Critical mass, Peer influence	N/A	SI	Facebook to Instagram migration
Loh <i>et al.</i> (2021)	Monetary value	Alternative Attractiveness	Switching costs, Trust Perceived security and privacy, Traditional payment habit	S.I.	Mobile payment
Sun <i>et al.</i> , (2017)	Dissatisfaction, Fatigue	Alternative Attractiveness, Subjective norm	Switching costs, Habit Affective commitment	S.I.	Mobile instant message (M.I.M.)
Tang and Chen (2020)	Information quality and service quality dissatisfaction, Person brand unfit	Alternative Attractiveness	Unfollowing costs	S.I.	Brand microblog users' unfollowing intention
Yoon and Lim, (2021)	Dissatisfaction	Perceived usefulness	Switching cost, Low I.T. innovativeness	S.I.	Online banking

Table 1: Factors of push, pull and mooring effects in online switching behaviour.

Hypotheses Development

Consumer participation in DeFi ecosystems requires use of cryptocurrencies or crypto tokens. Accordingly, this study investigates factors influencing consumers' willingness to, in part, switch from traditional fiat money to cryptocurrency. It is important to note that the switching behavior does not necessarily mean replacing products or services that are currently used. Switching behaviors may also be viewed as a complementary act of satisfying the needs of competing products or services (Lattin and McAlister, 1985). Defi ecosystems may thus complement the traditional financial system in some specific financial applications that can be improved by blockchain technology, such as the benefits of decentralized governance. Based on the cryptocurrency characteristics, this study employs the PPM research model to investigate the context-specific factors that motivate consumers to adopt new digital currencies (Bansal *et al.*, 2005; Cao *et al.*, 2020; Loh *et al.*, 2021; Sun *et al.*, 2017). As shown in Figure 1, the research model in this study contains the positive pull factors of "Relative Security and Control" and "Perceived Value of Cryptocurrency" that attract consumers to use cryptocurrency, the negative push factors of "Pricing Problem" and "Low Perceived Value of Traditional Fiat Money" that motivate consumers to change their behavior from using fiat money to cryptocurrency and the "switching costs" and "personal innovativeness in technology" in the mooring factors.

Figure 1. Research Model



Effect of Push Factors on Switching Intention to Cryptocurrency

Pricing Problems

Price-related problems are regarded as push factors in switching literature in which consumers perceive prices for products or services as too high, unreasonable, or unfair (Jung *et al.*, 2017; Keaveney, 1995). Activities concerning pricing have traditionally been recognized as a core component of the marketing mix (Chen *et al.*, 2021). In a transaction of products or services, price is often presented as selling prices, service charges, fees, or price deals containing monetary values (Chen and Keng, 2018; Heda *et al.*, 2017). Previous studies showed that the elements of price have a direct impact on consumers' decision-making and switching intention to another service provider (Antó *et al.*, 2007; Colgate and Hedge, 2001); channel (Chan *et al.*, 2017), revisiting theme park (Xie and Luo, 2021) and airlines (Jung *et al.*, 2017). In this study, the price problem relates to consumers' perception of high service charges, such as money transfer fees, correspondent fees, and recipient fees, by traditional banks when transferring money. The international transfer fees can be up to US\$ 50 per transaction (Goldberg, 2022). This negative factor pushes consumers' intention to switch to cryptocurrency with peer-to-peer transactions without intermediary services (i.e., traditional banks) (Gowda and Chakravorty, 2021). In other words, high service charges by traditional banks have push effects and positively influence switching intention to alternatives. Thus, we propose the following hypothesis.

Hypothesis 1 (H1): Pricing Problem (of traditional transfer fee) positively influences the switching intention.

Diminishing Value of Traditional Fiat Money

The diminishing value of traditional fiat money via inflation is perceived as a disadvantage to government-issued fiat currency (Kirkby, 2018). Fiat currencies, including all major currencies, such as the U.S. dollar, euro, and the Japanese, are not backed by precious metals, such as gold or silver (Wallace, 2010). In issuing fiat currencies, central banks thus do not need to hold reserves to support the currencies' value. This has traditionally resulted in inflation, as it may result in a political temptation to print excessive amounts of money to finance the budget. In addition, currency manipulation may be used to gain greater control over the economy (Gardini *et al.*, 2022). Overall, inflation results in a loss of wealth preservation and purchasing

power in traditional fiat money (Bagus et al., 2014). These drawbacks push customers' desire away from using traditional fiat money and looking for alternatives. Prior consumer research showed that perceived value drives customer behaviors (Mencarelli and Lombart, 2017). It is inferred that the perceived value of traditional fiat money is a significant factor in affecting customers' behaviors that involve monetary transactions in purchasing products and services. Hence, the following hypothesis is proposed:

Hypothesis 2 (H2): Low perceived value of traditional fiat money positively influences the switching intention.

Effect of Pull Factors on Switching Intention to Cryptocurrency

Relative Security and Control

Relative security and control refer to the users' perception of the cryptocurrency payment system and the degree to which they exert control over their financial transactions (Abramova and Böhme, 2016). Users are often unfamiliar with the new payment system. It is, therefore, important to enhance users' perception of the system's security for attracting and retaining customers (Kim et al., 2010. Zhang et al. (2019) explained that the controllability of a payment system is a key element of system security as it allows users to manage, authorize, and customize their payment transactions. In a recent review article on mobile payment (Leong et al., 2022), security has been one of the top clusters of payment services in research studies. Security and control have also been widely proven to be key determinants affecting customers' behaviors in the context of electronic payments (Williams, 2021, Lai, 2016, Lim et al., 2019). Prior studies have also attempted to identify ways to improve users' perception of security, such as biometric authentication (Ogbanufe and Kim, 2018), user interface (Zhang et al., 2019), and structural assurance (Zhou, 2011). Therefore, when customers perceive cryptocurrency payment's security and control level as high, they are more likely to switch to cryptocurrency payment from the traditional methods. The following hypothesis is proposed.

Hypothesis 3 (H3): Relative security and control positively influence the switching intention.

Perceived Value of Cryptocurrency

The perceived value of cryptocurrency refers to the effectiveness of cryptocurrency as a medium of exchange, store of value, and unit of account (Mattke et al., 2020). Although cryptocurrencies are often highly volatile (Levulyte and Sapkauskiene 2021),

they can potentially provide diversification benefits to customers (Aliu *et al.*, 2021), improving customers' (investment) portfolio effectiveness (Chuen *et al.*, 2017). Prior studies showed that cryptocurrency might be used as a hedge against inflation (Blau *et al.*, 2021) and a tool for wealth preservation and maintaining purchasing power (Ogunode *et al.*, 2022). These factors may provide customers additional benefits, increasing the perceived value over traditional fiat money. Prior studies showed that the perceived value of cryptocurrency affects customers' behaviors (Kuo *et al.*, 2009, Lin and Wang, 2006, Sharma and Klein, 2020). Nazifi *et al.*'s (2021) experimental studies also indicated that cryptocurrencies are perceived as an effective tool for customer service recovery satisfaction. Thus, we propose the following hypothesis.

Hypothesis 4 (H4): Perceived Value of Cryptocurrency positively influences the switching intention.

Effect of Mooring Factors on Switching Intention to Cryptocurrency

Switching Cost

Switching costs refer to user perceptions of the costs or disutility of changing product or service providers (Chen and Hitt, 2006). In the context of technology use, switching costs often include transition and sunk costs (Polites and Karahanna, 2012). Transition costs refer to the time, money, and effort required to adapt to new technology; sunk costs are customers' perceived costs (time, money, and effort) already invested in using the existing services or technology (Cao *et al.*, 2020). Switching costs have also been considered as a factor that results in inertia when switching to new technology. Therefore, users may become reluctant to change and prefer to maintain the status quo because of the perceived costs of switching between providers (Sun *et al.*, 2017). Prior studies have demonstrated the mooring effect of switching costs that impede customers' adoption of new technology in various contexts of technology use, such as social networking sites (Chang *et al.*, 2014), web browsers (Ye and Potter, 2011), and e-learning platforms (Chen and Keng, 2018). Thus, we posited that the switching cost to adopt cryptocurrency might hinder the switching intention of customers, and the following hypothesis is proposed.

Hypothesis 5 (H5): Switching cost negatively influences the switching intention.

Personal Innovativeness in Technology

Personal innovativeness in technology is defined as the propensity and willingness of customers to adopt new technology (Agarwal and Prasad, 1998; Dutta et al., 2015). In the seminal work of Midgley and Dowling (1978), personal innovativeness can be regarded as a personality trait that affects individual perceptions and behaviors across different contexts. Individuals with high personal innovativeness are more likely to be early adopters of new technology (Kasilingam, 2020). Zhang *et al.* (2020) summarized that customer innovativeness, global innovativeness, open-processing innovativeness, and dispositional innovativeness are often used interchangeably in prior research studies. These often refer to the personal acceptance level of new technology or systems. Personal innovativeness in technology has been proven to be a significant predictor of perceived usefulness, perceived ease of use, and intention to use new technology, such as mobile payment (Thakur and Srivastava, 2014), virtual reality (Fagan *et al.*, 2012), and smart home technology (Nikou, 2019). Individuals with high personal innovativeness in technology are more willing to switch to cryptocurrency. Thus, we hypothesize that consumers of high-level personal innovativeness in technology would have a stronger intention to switch to cryptocurrency.

Hypothesis 6 (H6): Personal innovativeness in technology positively influences the switching intention.

Effect of Switching Intention on Switching Behavior

Switching behavior to cryptocurrency

According to the theory of reasoned action, one's intention is the key determinant of whether she/he will perform a specific behavior or not (Ajzen and Fishbein, 1975). When individuals have a higher intention toward a specific activity, they are likely to engage in that activity. This intention-behavior relationship is well-examined in different contexts, including technology switching (Chen and Keng, 2019; Hsieh *et al.*, 2012; Sun *et al.*, 2017). We argue that individuals have a stronger intention to switch to cryptocurrency. They are likely to use cryptocurrency. Thus, the following hypothesis is proposed.

Hypothesis 7 (H7): Individuals' switching intention to cryptocurrency positively influences their switching behavior.

Research Methodology

Data collection

Through a research agency, we put on a self-administered online survey. Using a purposive sampling technique, we collected data from experienced cryptocurrency users. A questionnaire pretest was conducted with an information system professor and a marketing professor. There were screening questions in the questionnaire to determine the eligibility of respondents and ensure their validity. We excluded respondents with no cryptocurrency experience in this survey. Three hundred valid responses were collected by the research agency. The characteristics of the collected samples are shown in Table 2. All respondents were users with cryptocurrency experience in America. 51.7% of the respondents were female, while males accounted for 48.3%. Most respondents (25.3%) fell in the age group of 50 to 60 years old. For the education level, most respondents (31%) had the undergraduate level. Most respondents (29.7%) had an income of USD 6,001 or above.

Table 2. Demographic characteristics (N = 300)

Attributes	Category	Frequency	Percentage
Cryptocurrency usage experience	Never	145	48.3
	Less than 1 year	54	18.0
	1 – 2 years	59	19.7
	2 – 3 years	21	7.0
	More than 3 years	21	7.0
Gender	Male	145	48.3
	Female	155	51.7
Age	18-29	75	25.0
	30-39	74	24.7
	40-49	75	25.0
	50-60	76	25.3
	60+	0	0.0
Education level	Primary	9	3.0
	Secondary	53	17.7

		Associate Degree	51	17.0
		Higher diploma	34	11.3
		Undergraduate	93	31.0
		Master's or above	60	20.0
Income (USD)	level	Below USD 1,000	40	13.3
		USD 1,001 – 2,000	41	13.7
		USD 2,001 – 3,000	33	11.0
		USD 3,001 – 4,000	45	15.0
		USD 4,001 – 5,000	30	10.0
		USD 5,001 – 6,000	22	7.3
		USD 6,001 or above	89	29.7
Occupation		Full time (blue-collar)	57	19.0
		Full time (white-collar)	101	33.7
		Top management (managers or executives)	16	5.3
		Part-timer	22	7.3
		Self-employed	26	8.7
		Student	12	4.0
		Retired/ Unemployed	46	15.3
		Others	20	6.7

Measurement

The measurement items were set according to prior literature. A seven-point Likert scale was used (1 = strongly disagree, 7 = strongly agree). For pull factors, relative security and control were adapted from Abramova and Böhme (2016), and the relative perceived value of cryptocurrency was adapted from Hsieh et al. (2012) and Mattke *et al.* (2020). For push factors, the pricing problem was adapted from Chen and Keng

(2018) and Jung et al. (2017), and the low perceived value of traditional money was adapted from Mattke *et al.* (2020). For mooring factors, switching cost was adapted from Sun et al. (2017), and personal innovativeness was adapted from Dutta *et al.* (2015). For dependent variables, switching intention and switching behaviors were adapted from Hsieh *et al.* (2012). The constructs and measurement items are in Appendix A.

Data analysis

SmartPLS v4 was applied to perform the partial least squares structural equation modeling (PLS-SEM) data analysis. Most research adopted PLS-SEM because of the following unique benefits: (1) It is capable of studying numerous constructs; (2) It can analyze collected data with less strict restrictions on normal distributions; (3) It is suitable for studies that aim to analyze key additional constructs in the model (Hair et al., 2017). Therefore, PLS-SEM was used in the data analysis.

Results

Common method bias (CMB)

Common method bias (CMB) may lead to exaggerated relationships among the factors as the data is self-evaluated and collected from a single source. Hence, we assessed the CMB using Harman's single-factor test (Podsakoff *et al.*, 2003). The test indicated the single factor explained 48% of the variance, which does not exceed the maximal standard of 50%, showing that the CMB did not impact the questionnaire.

Measurement (outer) model results

Using PLS-SEM, we analyzed the collected data in this study with a two-stage approach. The results indicated that the measurement (outer) model satisfied internal consistency. The lowest values of composite reliability and Cronbach's alpha were ≥ 0.92 . The loadings of all measurement items were ≥ 0.86 , which is higher than the recommended threshold of 0.70, showing the satisfied level of internal consistency. Using the AVE, we checked the convergent validity. As shown in Table 3, the AVE scores of constructs were ≥ 0.81 , which is higher than the minimum standard of 0.50, indicating reliable convergent validity. Moreover, using the Heterotrait and Monotrait (HTMT) ratio (Henseler *et al.*, 2016), we examined the discriminant validity. Next, all the values of the HTMT ratio were lower than the standard of 0.90 maximally in Table 4 (Hair et al., 2017). The discriminant validity can be confirmed.

Table 3. Reliability and validity

Constructs	Items	Factor loading	Mean	SD
Relative Security and Control (R.S.C.) CR = 0.94, AVE = 0.85, Alpha = 0.94	RSC1	0.92	4.19	1.81
	RSC2	0.90	4.54	1.71
	RSC3	0.95	4.26	1.78
	RSC4	0.92	4.42	1.73
Relative Perceived Value of Cryptocurrency (RPV) CR = 0.94, AVE = 0.89, Alpha = 0.94	RPV1	0.93	4.24	1.84
	RPV2	0.96	4.26	1.78
	RPV3	0.95	4.22	1.75
Pricing problem (P.P.) CR = 0.94, AVE = 0.85, Alpha = 0.94	PP1	0.90	5.05	1.54
	PP2	0.94	4.83	1.62
	PP3	0.94	4.70	1.57
	PP4	0.90	4.59	1.63
Low Perceived Value of Traditional Money (L.P.V.) CR = 0.93, AVE = 0.88, Alpha = 0.93	LPV1	0.93	4.56	1.58
	LPV2	0.95	4.63	1.56
	LPV3	0.93	4.43	1.61
Switching cost (S.C.) CR = 0.94, AVE = 0.81, Alpha = 0.92	SC1	0.89	4.31	1.69
	SC2	0.94	4.39	1.71
	SC3	0.92	4.34	1.67
	SC4	0.86	4.66	1.62
Personal Innovativeness in Technology (P.I.T.) CR = 0.92, AVE = 0.86, Alpha = 0.92	PIT1	0.92	5.00	1.49
	PIT2	0.93	4.28	1.87
	PIT3	0.93	5.00	1.66

Switching intention (S.I.)	SI1	0.93	4.61	1.81
CR = 0.94, AVE = 0.89,	SI2	0.94	4.01	1.90
Alpha = 0.94	SI3	0.95	3.99	1.86
Switching behaviors (S.B.)	SB1	0.94	3.29	2.03
CR = 0.95, AVE = 0.91,	SB2	0.96	2.90	2.01
Alpha = 0.95	SB3	0.96	2.96	1.99

Table 4. HTMT ratios

Constructs	LPV	PIT	PP	RPV	RSC	SB	SC	SI
LPV								
PIT	0.41							
PP	0.48	0.28						
RPV	0.51	0.58	0.5					
RSC	0.52	0.6	0.52	0.89				
SB	0.39	0.59	0.41	0.73	0.71			
SC	0.06	0.2	0.14	0.4	0.44	0.28		
SI	0.53	0.66	0.52	0.85	0.83	0.8	0.44	

As shown in Figure 2, the model explained 73% of the variance in switching intention, which was significantly determined relative perceived value of cryptocurrency ($\beta = 0.39$, $p < 0.001$), personal innovativeness of technology ($\beta = 0.22$, $p < 0.001$), switching cost ($\beta = -0.14$, $p < 0.001$), relative security and control ($\beta = 0.18$, $p < 0.01$), pricing problem ($\beta = 0.10$, $p < 0.05$), and low perceived value of traditional money ($\beta = 0.08$, $p < 0.05$). While 60% of the variance in switching behaviors was significantly determined by switching intention ($\beta = 0.67$, $p < 0.001$), supporting H7. These results supported H1, H2, H3, H4, H5, and H6. In addition, four control variables have been examined, namely gender, age, education, and monthly personal income. Only age (β

= -0.13, $p < 0.01$) and gender ($\beta = -0.16$, $p < 0.05$) exerted a significant effect on switching behaviors.

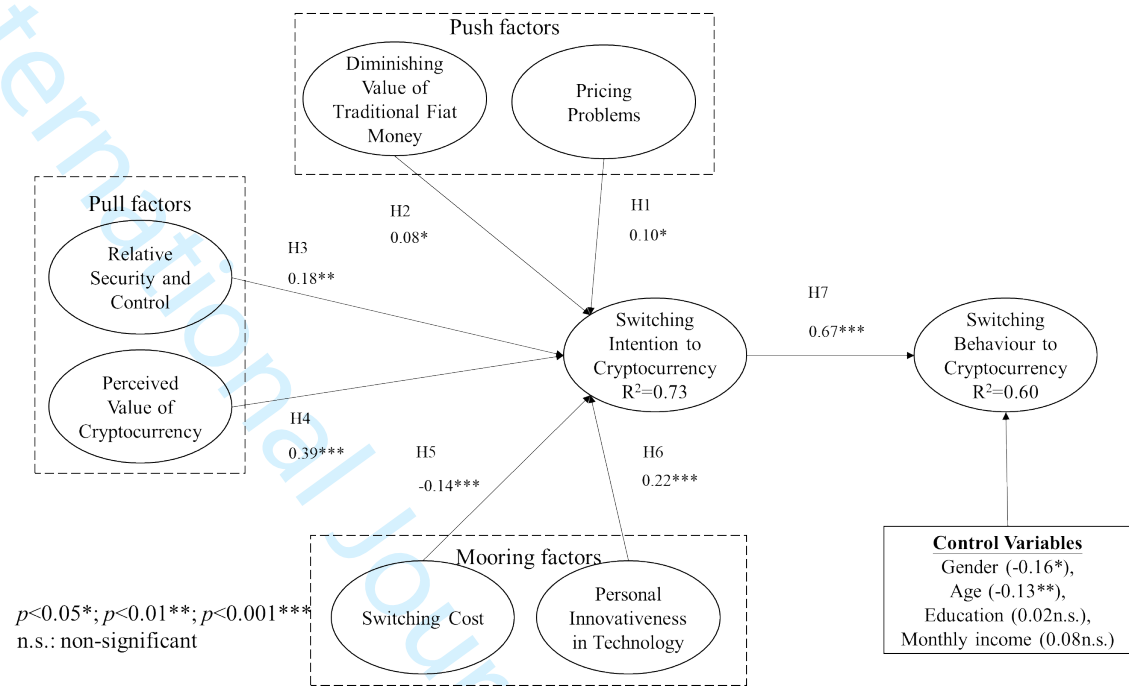


Figure 2. Model Results

Discussion and Implications

We will discuss the significance of the findings in the broader context of DeFi ecosystem adoption. First, as a significant pull factor, the respondents perceived cryptocurrencies as a relatively safe asset class in relation to money transfers. Problematically, there are considerable risks in making cryptocurrency fund transfers, which seem to contradict the respondents' perception of safety. For example, a simple user error in typing the crypto wallet address may result in a permanent loss of assets, such as accidentally transferring Ethereum cryptocurrency into a BTC wallet. Furthermore, unlike the regular banking system, there is no customer service personnel to assist with problems in making cryptocurrency transfers. The respondents, however, appropriately identified the increased user control in making cryptocurrency transfers based on decentralization. In contrast, electronic fiat currency transfers are centrally facilitated, monitored, and controlled by banks and government authorities. Furthermore, respondents recognized cryptocurrencies as a means to operate more anonymously, whereby user information and related fund transfer information may be regarded as more secure than fiat currencies.

As an additional significant finding, the respondents perceived cryptocurrencies

(i) as a hedge against inflation, (ii) as a means to conserve purchasing power, and (iii) as a means to preserve wealth in comparison to traditional fiat money. We recognize that this finding in consumer attitudes is, in part, counterintuitive, given that many cryptocurrencies exhibit significant risk in terms of price volatility (Wang *et al.*, 2023). Based on the historical volatility of cryptocurrencies, such as BTC, loss of value is a significant risk for cryptocurrency holders. Hence, it is surprising that the respondents perceived cryptocurrencies as a means of “preserving wealth” compared to traditional fiat currencies. This is furthermore surprising as the respondents were based in the US, where the dollar provided a relatively stable medium of exchange. The findings would have been more understandable in countries where the inflation of fiat money is a significant economic challenge. However, to explain this counter-intuitive finding, we can conjecture that while many cryptocurrencies have been volatile in the short term, some of the leading cryptocurrencies have also demonstrated resilience and potential for long-term appreciation. Indeed, historical data shows that BTC has recovered from downturns and has outperformed traditional assets and fiat currencies over extended periods (Weber, 2016). Thus, the respondents may have expected long-term value gains in cryptocurrency valuations while disregarding short-term price fluctuations.

In addition, the findings in relation to the risk - in terms of price volatility - can be, to an extent, explained by Hofstede’s cultural dimension of “Uncertainty Avoidance” (Hofstede, 2001), as the US has a moderately low score of 46 on “Uncertainty Avoidance” in comparison to other collectivist countries/ regions in Asia, such as Japan (92) and Korea (85) (Insights, 2024). Hence, people in the US may be more willing to take risks in the face of cryptocurrency volatility than people in various collectivist countries. It is also important to position the use of cryptocurrency in the context of state power, as states have a vested interest in protecting their own centrally controlled national currencies at the expense of private cryptocurrencies. For example, Gary Gensler, the Chair of the U.S. Securities and Exchange Commission (S.E.C.), viewed many cryptocurrencies as unlicensed securities, initiating litigation against various cryptocurrency projects (Jackson-Hill, 2022). The political climate was, however, changing in mid-2023, whereby some politicians, including former President Trump, began showing support for cryptocurrencies, signaling a shift in the political landscape.

Finally, the seemingly counterintuitive findings may be explained by the technological innovations inherent in some of the leading cryptocurrencies. For

example, the BTC algorithm limits the maximum supply of BTC to 21 million coins while cutting the inflation rate by 50% every "halving cycle". (Nakamoto 2008). Cryptocurrencies may thus limit (or even eliminate) inflation by algorithmically restricting the issuance of new coins. Furthermore, due to the BTC's decentralized governance, an algorithmic commitment to a low inflation rate is credible, as it is exceedingly difficult (if not impossible) for any one party to change BTC's monetary policy (Weber 2016). Conversely, traditional central banks are unable and/ or unwilling to provide such strong guarantees to protect the value of fiat currencies against inflation. Based on historical analysis, all fiat currencies have experienced perpetual declines in their value compared to hard assets, such as gold (Weber 2016). This understanding can thus be used to explain the respondents' perception of cryptocurrencies as a means to preserve purchasing power and wealth, functioning as significant pull factors influencing switching to cryptocurrencies. In addition, it has been recognized that cryptocurrencies provide significant means to advance financial innovation (Yadav *et al.*, 2022). Accordingly, in the findings, the respondents perceived cryptocurrencies to reduce the costs of money transfers, in contrast to the excessive costs associated with traditional fiat currencies.

The research findings on consumer adoption of cryptocurrencies have significant practical implications across various sectors, influencing economic and commercial activities, educational frameworks, public policy, and the broader societal landscape. In the economic realm, understanding the push-pull-mooring factors that drive individuals to adopt cryptocurrencies can inform businesses and financial institutions about consumer preferences and behaviors. This knowledge can guide the development of tailored financial products that leverage the perceived advantages of cryptocurrencies, such as lower transaction costs and enhanced security. For instance, financial service providers may create hybrid offerings that combine traditional banking with cryptocurrency features to attract consumers. In educational contexts, this research highlights the importance of user perceptions as a driver of cryptocurrency adoption. This underscores the importance of educating students about the mechanics of cryptocurrencies and their potential benefits and risks to facilitate more informed consumer use of cryptocurrency assets. In addition, the insights gained from this research can aid policymakers in understanding the implications of cryptocurrency adoption on financial regulation and consumer protection. As governments worldwide

grapple with regulating digital currencies effectively, understanding consumer perceptions can provide evidence-based recommendations to shape regulatory frameworks promoting innovation while safeguarding consumers.

Overall, these innovations align with the principles of decentralization and financial self-sovereignty, empowering individuals while reducing dependence on centralized institutions (Weber, 2016). Additionally, the transparency inherent in cryptocurrency systems builds trust in financial transactions, as all records are immutable and publicly accessible. This is particularly advantageous in developing regions where traditional financial systems may need to be more reliable. Increased adoption could enhance financial inclusion for underbanked populations by providing access to decentralized financial services (Ozili, 2022). Cryptocurrency ownership expands access to decentralized finance (DeFi) activities, such as liquidity provision and yield farming, thereby increasing financial service availability and investment opportunities. Additionally, cryptocurrency adoption can have far-reaching significance beyond the traditional use of a currency to make payments. For example, cryptocurrency (or token) ownership can allow users to participate in the governance of decentralized communities, including voting rights on platform governance and development (McFarland 2021). Cryptocurrencies and their underlying blockchain technology are thus significant innovations that allow for increased community-driven governance, inclusivity, and transparency.

Limitations and directions for future research

This study contributes to the literature by advancing the understanding of individuals' switching behaviors from traditional fiat money to cryptocurrencies as a precursor to consumer participation in DeFi ecosystems. A push-pull-mooring model was used to explain which factors affect individuals' switch to cryptocurrency. In particular, we investigated how push (i.e., diminishing value and pricing problems), pull (i.e., relative security and perceived value), and mooring (i.e., switching cost and personal innovativeness) factors shape their switching intentions. The results confirmed that the push, pull, and mooring factors have a significant impact on switching intention to cryptocurrency. Furthermore, we found that switching intention was significant to switching behavior. Most notably, perceptions of diminishing value and pricing problems push individuals away from fiat currencies, whereas relative security and perceived value pull individuals to cryptocurrency. In addition, switching costs and

personal innovativeness affect their switch decisions. These findings offer key insights and implications for financial institutions to retain existing users and attract new customers.

We wish to acknowledge the following limitations and directions for future research. First, the data were collected in the U.S., whereby the study may need to be replicated in other contexts. Hence, it is vital to consider the possible impact of cultural, economic, and other environmental factors. Second, as another limitation, this investigation was a cross-sectional study that focused on the factors driving customers' switching behaviors. Accordingly, it may be meaningful to investigate the continuance of adoption behavior by a longitudinal research design. Third, voluntary participation in the survey might have recruited respondents already interested in cryptocurrencies. As a result, future research may extend this study to a larger and more nationally representative sample.

Appendix A. Constructs and measurement items

Constructs	Questionnaire items	Sources
Relative Security and Control (RSC)	RSC1) I use cryptocurrency transfers because it is more secure. RSC2) I can control my money better when I use cryptocurrency transfers. RSC3) I perceive cryptocurrency transfers safer. RSC4) I perceive the information relating to users and cryptocurrency transfers as more secure.	Abramova & Böhme (2016)
Relative Perceived Value of Cryptocurrency (RPV)	RPV1) I use cryptocurrency because it is a more effective hedge against inflation than traditional money. RPV2) I use cryptocurrency because it has more conserve of purchasing power over time than traditional money. RPV3) I use cryptocurrency because it provides better preservation of wealth than traditional	Hsieh <i>et al.</i> (2012) and Mattke <i>et al.</i> (2020)

	money.	
Pricing problem (PP)	PP1) In general, the cost of transferring traditional money through a traditional bank is too high.	Chen and Keng (2018)
	PP2) In general, the cost of transferring traditional money through a traditional bank is not reasonable.	and Jung <i>et al.</i> (2017)
	PP3) In general, the cost of transferring traditional money through a traditional bank is not fair.	
	PP4) Overall, the cost of transferring traditional money through a traditional bank is not appropriate.	
Low Perceived Value of Traditional Money (LPV)	LPV1) I think fiat money does not have the storing value over long periods.	Mattke <i>et al.</i> (2020)
	LPV2) I think fiat money does not enable to conserve of purchasing power over time.	
	LPV3) I think fiat money does not enable the preservation of wealth.	
Switching cost (SC)	SC1) In general, switching to cryptocurrency would be a hassle.	Sun <i>et al.</i> (2017)
	SC2) In general, it would be a trouble to switch to using cryptocurrency as a payment method.	
	SC3) Generally, it would take a lot of time and effort to switch to cryptocurrency payment transfer.	
	SC4) Overall, it would take a lot of learning costs towards switching to cryptocurrency payment transfer.	
Personal Innovativeness in Technology	PIT1) If I heard about new technology, I would look for ways to experiment with it.	Dutta <i>et al.</i> (2015)
	PIT2) Among my peers, I am usually the first to	

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(PIT)	try out new technologies.	
	PIT3) I like to experiment with new technologies.	
Switching intention (SI)	SI1) Given the opportunity, I have used cryptocurrency.	Hsieh <i>et al.</i> (2012)
	SI2) The likelihood of switching to cryptocurrency was high.	
	SI3) I was considering using more cryptocurrency transfers and less traditional money wire transfers.	
Switching behaviors (SB)	SB1) In terms of frequency of usage, I chose to use cryptocurrency to transfer funds more often in the past 12 months.	Hsieh <i>et al.</i> (2012)
	SB2) Cryptocurrencies have been my first choice of fund transfer in the past 12 months.	
	SB3) Regarding fund transfers, I have used more cryptocurrency transfers than traditional bank wire transfers in the past 12 months.	

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