Value-Cost Model for Cryptocurrency Adoption

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Abstract

This study aims to develop an adoption model that explains the adoption of technologies with an economic aspect. A Value-Cost Model for Cryptocurrency Adoption is proposed and discussed. It integrates Transaction Cost Economics Theory (TCE) and the concept of perceived value. Research hypotheses and their theoretical background are presented, and the method is discussed.

Keywords

Cryptocurrency, adoption, bitcoin, transaction cost, value.

Introduction

The wide adoption of cryptocurrencies is predicted to transform the economies of today's world (De Filippi 2014; Kshetri 2017). Cryptocurrency technology can help 1.7 billion unbanked adults worldwide to access banking services, according to the latest world bank report in 2017. Due to their underlying technology (Blockchain), Cryptocurrencies provide users with lower costs, more transparency, enhanced security, and high-speed transactions (Wesley 2018). Chuen et al. (2019) consider cryptocurrencies an appropriate alternative to diversify investment portfolio risks where their returns can surpass the ones of traditional investment assets. However, only 7.6% of the world's population uses cryptocurrencies (Wang 2021). Only 1.4% of Americans own at least one cryptocurrency (Auer and Tercero-Lucas 2021). Compared to the volume of transactions and the number of cryptocurrencies, it is evident that the adoption rate is low. As of now, the world has not reached a level of acceptance such that Bitcoin or any cryptocurrency that relies on peer-to-peer networks poses a severe threat to any major leading fiat currency (FCA 2020).

Although research on cryptocurrency is scarce and still in its infancy, several studies have investigated the adoption issue. The majority of these studies rely on existing adoption and human behavioral intentions theories such as the Theory of Planned Behavior (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), and Technology Acceptance Model (TAM). Nevertheless, these theories fall short in explaining technology with an economic side. In addition, most of these models aim to explore information systems in an organizational context, making them insufficient when explaining cryptocurrency adoption. Therefore, this paper seeks to address these gaps by investigating cryptocurrency adoption through developing an adoption model based on the Transaction Cost Economics Theory (TCE) and perceived value.

The contributions of this paper are fourfold. First, the research model considers the individual differences between users and how they impact cryptocurrency adoption decision-making. Second, the proposed model captures other aspects of value beyond the previous utilization where perceived value is limited to the utilitarian aspect. It explores value perceptions relevant to cryptocurrency and its virtual nature, namely, materialization and hedonic value. Consequently, this research will add to the body of knowledge by presenting a model that explains the adoption of technologies with an economic aspect, explaining the adoption of complex innovations such as non-fungible tokens (NFTs). Third, it will help practitioners and policymakers understand what constitutes the adoption, making them capable of shaping future strategies related to development and marketing. Finally, the findings could shed light on the digital divide issue. For instance, lacking access to internet connectivity regularly can prevent users from using cryptocurrency and taking part in economic prosperity. The rest of the paper is structured as follows: it starts with the literature review, research model, conclusion, and next step.

Literature Review

Cryptocurrency Adoption

The rapid growth of the cryptocurrency market, accompanied by its price volatility, has attracted much attention, resulting in its emergence as an attractive field of study (Dyhrberg 2016; Nadeem et al. 2020). IS researchers empirically investigate the factors impacting the adoption decision through the lens of adoption and acceptance theories. Spenkelink (2014) is among the first studies that look at Bitcoin adoption where she identifies three main pillars for future mass adoption; ease of use, price stability, and improved governance. By utilizing TPB, DOI and TCE, researchers conclude that perceived benefits and service computability impact the behavioral intentions to use Bitcoin (Yoo et al. 2020). Schaupp and Festa (2018) also adopt TPB, exploring students' willingness to adopt cryptocurrency, indicating that attitude, subjective norms, and behavioral control are positively associated with usage. Yet, UTAUT and TAM are utilized the most by researchers. For instance, Arias-Oliva et al. (2021) explore households' motivation to use cryptocurrency either as a payment method or as an investment and conclude that performance expectancy has the strongest effect, confirming (Silinskyte 2014). However, performance expectancy is inferred to have no significant influence on cryptocurrency adoption in Nadim (2017). In addition, (Almuraqab 2020; Baur et al. 2015) conclude that perceived usefulness and preserved ease of use positively affect cryptocurrency adoption. Yet, other researchers confirm the significant role of only perceived usefulness (Lee 2018).

Transaction Cost Economics (TCE)

A transaction is defined as how a good or service is transferred across a technologically separable interface (Williamson 1985). TCE has two critical assumptions, which are bounded rationality, and opportunism. Bounded rationality refers to humans' limited memories and processing capacity, making them unable to process all information at once fully. Opportunism refers to how people might act in their self-interest, where some of them might not always act with honesty (Williamson and Ghani 2012). Accordingly, TCE identifies three dimensions affecting the transaction costs_ uncertainty, asset specificity, and transaction frequency.

TCE has been adopted to explore products suitable for e-commerce (Liang and Huang 1998), mobile payment adoption (Abooleet and Fang 2021; Gao and Waechter 2017), repurchase intention in online auctions (Yen et al. 2013), online travel market loyalty and satisfaction (Kim and Li 2009), and electronic toll systems adoption (Chen et al. 2007).

Previous research utilization of TCE primarily explains the monetary cost of using a particular technology. This usage excludes the subcomponents of this construct and its antecedents; perceived uncertainty and asset specificity. Such applications limit the power of TCE in explaining the adoption of technology, especially those with an economic side. This proposal utilizes TCE in full and extends it by incorporating the perceived value that is reviewed next.

The Concept of Perceived Value

The initial research on perceived value focuses on the quality-price relationship. This, in a way, brought the definition of value as the “cognitive trade-off between perceptions of quality and sacrifice” (Dodds et al. 1991). As a result, the perceived value was conceptualized as this unidimensional construct. Later on, researchers emphasized the importance of the emotional perspective in understanding value (e.g., Holbrook, 1994). Thus, scholars started to develop multidimensional constructs to account for several perspectives. Perceived value has four interrelated dimensions: (1) emotional value, (2) social value, (3) economic value and (4) functional value (Sweeney and Soutar 2001).

Most conceptualizations of perceived value assume that users process information rationally. This means that they can assess gains and losses at once, which results in their overall perception of value. Nevertheless, this is not accurate, especially when there are many uncertainties and specific investments to be made. Thus, TCE can explain the total costs (loses) that are a part of users' calculation, while perceived value processes the gains. Accordingly, if users' perceptions of value are higher than their perception of cost, it leads to positive behavior towards the thing they assess; cryptocurrency adoption in this case.

Research Model

The premise of the Value-Cost Model for Cryptocurrency Adoption is that users' intentions to adopt cryptocurrency result from their assessment of the costs endured versus the value gained while using it. Consequently, if their Perceived Value is always higher than the Perceived Transaction Costs, they are more likely to adopt cryptocurrency. Perceived Transaction Costs is a dynamic factor that differs among different users and for the same user based on the situation and circumstances they are currently experiencing. For instance, when users have doubts about future regulations in their country or experience permanent connectivity issues, the cost of using cryptocurrency will increase regardless of the current adoption status. Consequently, if users perceive cryptocurrency as a costly technology, their adoption intentions will be negatively affected. As long as users' perception of value is high, the costs of using cryptocurrency are regarded as not necessary since value surpasses them, leading to positive intentions to adopt.

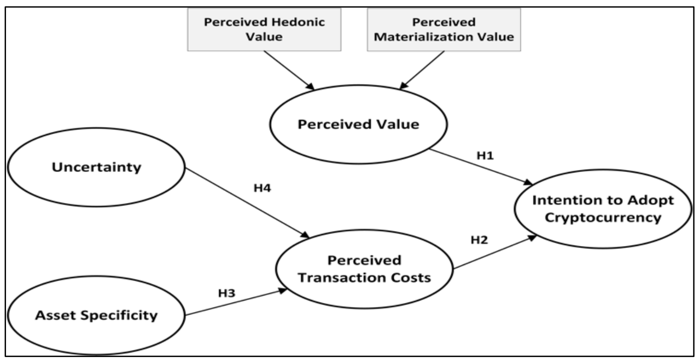

Figure 1. Value-Cost Model for Cryptocurrency Adoption

Perceived Value

The previous utilization of value where cost is considered in the valuation process is incomplete. As the TCE explains, people have bounded rationality that limits them from processing all information at once. Therefore, the author argues that value should be assessed against the perceived cost to have a complete evaluation. If the perceived value is higher than the perceived cost, users' intention to adopt cryptocurrency will be positively impacted. In this study, Perceived Value is a multidimensional construct explained by Perceived Materialization Value and Perceived Hedonic Value.

1) *Perceived Materialization Value*: it represents users' belief in the global market acceptance of cryptocurrencies, creating value in them. The global market here means that cryptocurrency is publicly accessible and tradable to anyone worldwide. For users, such belief signifies that cryptocurrency is trustworthy, exchangeable and materializable; therefore, it holds value even though it is purely virtual. This belief is subjective where different users have different views emphasizing the role of individual differences in users' perceptions of cryptocurrencies value. 2) *Perceived Hedonic Value*: this construct explains any perceived value that cannot be materialized, such as the thrill, enjoyment, and arousal feeling that users experience while using cryptocurrencies. The hedonic process is usually accompanied by fantasy, feel, fun and sign-related elements (Hirschman and Holbrook, 1982). Thus, the author defines Perceived Hedonic Value as the extent to which users perceive cryptocurrency as pleasurable, exciting, enjoyable, and fun to use. Thus, we hypothesize:

H1: Perceived value is positively associated with Intention to Adoption

Perceived Transaction Cost

TCE's basic assumption is that people who conduct the exchange have limited memory and cognitive processing capacity to process such information accurately. Some of the exchange parties might act in their own best interest. The basic principle of TCE is that people prefer to conduct a transaction to minimize their transaction costs. Thus, we define Perceived Transaction Costs as users' perception of the aggregated costs (tangible and intangible) associated with using cryptocurrency. Perceived Transaction Costs represent different facets such as cryptocurrency inconvenience, complexity, trading difficulty, etc., compared to other financial solutions such as cash or stocks. Thus, we hypothesize:

H2: Perceived Transaction Costs are negatively associated with Intention to Adoption

Asset Specificity

Williamson (1985) defines asset specificity as durable investments undertaken to support particular transactions. The redeployment of such investments will entail some switching costs. In this study, users might invest in many forms of assets, such as learning how to use cryptocurrency, installing a specific tool/app (e.g., digital wallets), or overcoming entry barriers to access cryptocurrency, such as having an internet connection. For example, if a user believes that learning how to share their public key (i.e., address) is cumbersome, their prescription of the costs increases. Therefore, Asset Specificity can be captured through two sub-constructs: Perceived Complexity and Perceived Access Barriers.

1) *Perceived Complexity*: it is defined as the degree to which a cryptocurrency is difficult to understand and use. This construct and its effects have been extensively investigated under different labels (i.e., perceived ease of use, perceived trialability, effort expectancy etc.) in various contexts, including cryptocurrency adoption. 2) *Perceived Access Barriers*: we argue that users might have to overcome non-technical barriers such as affording to have a data subscription plan to be able to use cryptocurrency. These barriers might be salient to cryptocurrency, which positively increases users' perception of the cost. It has been concluded that Asset Specificity increases the perceived transaction costs of mobile payment technology (Abooleet and Fang 2021). Thus, we hypothesize:

H3: Asset Specificity is positively associated with Perceived Transaction Costs

Uncertainty

It is assumed that all transactions are conducted under a level of uncertainty (Gao 2015). Uncertainty is the extent to which users believe that using cryptocurrency involves the possibility of exposure to security and privacy threats and harm. Uncertainty is explained by three sub-attributes that have been previously proven to raise the possibility of imposing liability.

1) *Perceived Technological Uncertainty:* it refers to the unpredictability of technological development, the turbulent technological environment, and uncertainty about the functions and consequences of the technology. 2) *Perceived regulatory uncertainty:* regulations are constantly changing, presenting new challenges for technology innovations such as cryptocurrency. Consequently, this disrupts the cryptocurrency spectrum, leading users to perceive higher transaction costs. *3) Perceived Risk*: it represents users' overall perception of whether using cryptocurrency is risky or not. Thus, we hypothesize that:

H4: Uncertainty is positively associated with perceived transaction cost

Conclusion and Next Step

A Value-Cost adoption model is proposed, hypothesizing that adoption intentions are explained by users' assessment of perceived value against perceived transaction cost. A higher overall perceived value leads to higher intentions to adopt cryptocurrency. This research will adopt a quantitative method by proposing an online survey study using Structural Equation Modeling (SEM) to test and validate the proposed model.

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