The Impact of Knowledge and Experience on Opinion Formation: The Case of Cryptocurrencies

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Abstract: The aim of this paper was to investigate the influence of knowledge and experience in a specific domain on the formation of opinions regarding a particular issue. The research focused on cryptocurrencies, chosen due to their relatively new and unexplored nature in terms of opinion formation. A survey questionnaire was used to collect data from 778 university students, which were then analyzed using the SmartPLS package. The survey was conducted in Poland, a country where cryptocurrencies are treated relatively neutrally, not being banned but also not widely accepted as a means of payment. The main research question addressed whether previously acquired knowledge and experience with cryptocurrencies impact opinion formation. Four latent variables were examined: Experience, Perceived Benefits, Perceived Disadvantages, and Opinion Formation. The findings reveal that Experience has the strongest influence on Opinion Formation, followed by Perceived Benefits, which has a positive effect, and Perceived Disadvantages, which has a negative effect. Therefore, the hypotheses were supported, indicating a positive association between Perceived Benefits and Opinion Formation (H1), as well as between respondents' Experience with cryptocurrencies and Opinion Formation (H3). Additionally, H2 was supported, indicating a negative association between Perceived Disadvantages and Opinion Formation. Our research results enrich the literature, particularly in the field of interdisciplinary approaches to cryptocurrencies, knowledge, and experience.

Keywords: Experience with cryptocurrencies, Knowledge, Perceived benefits, Perceived disadvantages, Cryptocurrencies, Opinion formation

1. Introduction

An opinion is a belief, judgment, or view expressed by an individual or a group of people regarding a particular matter. Opinions can be rooted in scientific facts and evidence or be subjective in nature. They are influenced by beliefs, values, experiences, and emotions (Paul, 2007). Opinions play a crucial role in shaping our attitudes and behaviors. In fact, opinions are sometimes regarded as synonymous with attitudes (Oskamp & Schultz, 2014). They are formed through a combination of personal beliefs, trust in something, knowledge, personal experiences, and individual interpretation of facts.

Opinions may be supported by arguments or expressed without any substantial basis (Festinger, 1957). They can be shaped by a person's knowledge, experience, or direct involvement in the subject matter being discussed. Opinions that are grounded in logical reasoning and personal experience tend to be closer to the truth and therefore hold more value. However, a separate issue not addressed in this paper is the credibility and substantive value of opinions. Participation in a matter can sometimes be superficial or limited, and the emotions associated with it may differ significantly from those of other individuals (Rapanos, 2023). Opinions can be influenced by emotions and, as a result, may be biased. Furthermore, opinions are subject to change over time, influenced by mood, recent experiences, and various other factors that shape one's perception of reality. Often, opinions are influenced by the views of others, particularly when those individuals are part of our social environment or are perceived as trustworthy or likable (Lee, Yang, & Kim, 2022).

The formation and consolidation of our opinions can be influenced by both rational and irrational factors. Opinions can be shaped through extensive studies, deep knowledge of the subject, practical experience, and personal engagement. While they often involve intuition, the connection between opinions and knowledge/experience may not always be obvious. However, opinions can also be swayed by prejudice, faith, personal biases, and even superstition (Berthet, 2022; Kuppens et al., 2023).

This paper addresses the issue of forming opinions based on experience and perceived advantages and disadvantages. The survey specifically focuses on people's opinions regarding a relatively new, controversial, and ambiguous topic: cryptocurrencies. Respondents were asked about their experience with cryptocurrencies, as well as their perceived benefits and disadvantages associated with their use as a means of payment. The primary objective of this paper is to investigate the impact of previously acquired knowledge and experience on

opinion formation. Additionally, it aims to examine whether perceived benefits and perceived disadvantages influence the formation of opinions.

Numerous papers have been published on cryptocurrencies, with many authors focusing on economic aspects such as national regulations, taxation, and monetary policies (Benigno et al., 2022; Marthinsen & Gordon, 2022; Raza et al., 2023). While some authors examine the domestic approach, their focus is primarily limited to economic matters (Alvarez et al., 2022; Cifuentes, 2019; Li et al., 2023). Many papers concentrate solely on Bitcoin, as it is the most widely recognized cryptocurrency (Alvarez et al., 2022; Köchling et al., 2020; Mzoughi et al., 2022; Nouir & Hamida, 2023). In contrast, our paper adopts an interdisciplinary approach to cryptocurrencies, treating them as a complex phenomenon rather than merely an economic variable. Specifically, we provide a concise overview of cryptocurrencies, which serves as the foundation for our empirical research on the impact of experience, perceived benefits, and perceived disadvantages on opinion formation. The study incorporates in-depth analysis, considering respondents' personal experiences and opinions regarding cryptocurrencies.

The paper is organized as follows: the research questions and hypothesis are followed by the research methodology; then results, analysis, and discussion are provided. The paper concludes with a summary, limitations, and avenues for future research.

2. Literature Review

The inception of cryptocurrencies is closely tied to the creation of the first cryptocurrency, Bitcoin (BTC), in late 2008 and early 2009 (Nakamoto, 2009). The trading of cryptocurrencies, which serve as digital substitutes for traditional money, relies on various technologies such as the Distributed Ledger concept, Blockchain technology, cryptography, and peer-to-peer networks. The number of cryptocurrencies has experienced exponential growth, and the cryptocurrency market has become too significant to be ignored (CoinMarketCap, 2023; Phillips & Graves, 2021).

The volume of literature on cryptocurrencies is extensive. Numerous authors discuss the benefits and disadvantages of cryptocurrencies, as summarized in Table 1. The review includes publications within the past eight years.

Table 1: The Benefits and Disadvantages of Cryptocurrencies

Benefits	Sources	Disadvantages	Sources
Decentralization: [B1 DEC, B3 NI] Where: NI-No Issuer	(Chenguel, 2021; Lee, 2019; Narayanan et al. 2016; Kopańko & Kozłowski, 2015; Bala, Kopuściański, & Srokosz, 2016)	Volatility and risk management: [D4 VOL]	(Almeida & Cruz Gonçalves, 2022; Al Guindy, 2021; Peng et al. 2018; Baur, Dirk, & Dimpfl, 2018; Klein et al. 2018; Katsiampa, 2017)
Lower transaction Fees: [B2 LTF]	(Frankenfield, 2023; Tambe & Jain 2023; Hileman & Rauchs, 2017)	Lack of Regulation: [D2 LGAP]	(Chenguel, 2021; Lee, 2019; Kopańko & Kozłowski, 2015; Bala, Kopuściański, & Srokosz, 2016, Song, Chen, & Wang, 2023; Kim et al. 2022, Dordal, 2018; Hardy & Norgaard, 2016 Böhme et al. 2015)
Security	(Thul, 2021; Zimprich, 2019; Lewis, 2018; Narayanan et al. 2016; Burniske, & Tatar, 2017; Bonneau et al. 2016; Vigna & Casey, 2015)	Security risks: [D5-SECU, D3-LOSS]	(Weichbroth et al. 2023; Yu et al. 2022; Zaghloul et al. 2020; Zimprich, 2019)
Privacy and anonymity: [B4 PRI]	(Lewis, 2018; Antonopoulos, 2017; Burniske & Tatar, 2017; Vigna & Casey, 2015; Kopańko & Kozłowski, 2015; Bala, Kopuściański, & Srokosz, 2016)	Environmental impact: [D1 ENV]	(De Vries, 2018; Hileman & Rauchs, 2017; Peck, 2017; Stoll, Klaaßen, & Gallersdörfer, 2019; Wendl, Doan, & Sassen, 2023; Vranken, 2017)

Benefits	Sources	Disadvantages	Sources
Fast Transactions	(Frankenfield, 2023; Tambe & Jain 2023; Hileman & Rauchs, 2017)	Limited Acceptance	(Bajpai, 2023; Eisenbardt & Eisenbardt, 2023; LLC, 2021)

Note: The abbreviations given in [ ] correspond to the model below (see Figure 2). The table includes additional benefits and disadvantages compared to what is displayed in the model. This is because some variables were found to be statistically insignificant ($p>0.05$) and were therefore excluded from the model.

Source: Own elaboration based on the literature sources provided.

Cryptocurrencies represent an interdisciplinary, relatively new, and rapidly evolving field. The problem of identifying the creator of BTC, the lack of an emitter, volatility, complexity and legal complexities stand in opposition to the undoubted benefits, among which the free, anonymous and rapid flow of capital can be mentioned. Notably, there have been significant cases of cryptocurrencies being used for illicit purposes, such as the Silk Road case. Moreover, the environmental impact of cryptocurrencies is a concern due to the increasing energy intensity of mining activities. The significant slump in the cryptocurrency market in 2022 serves as a reminder of the risks associated with investing in cryptocurrencies (CoinMarketCap, 2023).

Nevertheless, the pros and cons of cryptocurrencies appear to be balanced. Does this mean that opinions on this subject are divided or perhaps more sustainable? Can the assessment of cryptocurrencies be influenced by knowledge about them, involvement in cryptocurrency trading, participation in cryptocurrency mining, or access to a cryptocurrency wallet? These activities can indicate experience, and it is undeniable that knowledge and experience shape opinions. Variables related to knowledge and experience were compared with variables indicating respondents' attitudes towards the benefits and disadvantages of cryptocurrencies. All of these variables influence the opinions of respondents in the realm of cryptocurrencies.

3. Research Methodology

3.1 Research Purpose, Questions, and Hypotheses

The aim of this paper is to explore how knowledge and experience in a specific domain can shape opinions on particular issues. Cryptocurrencies were chosen as the research subject due to their relatively new and unexplored nature in terms of opinion formation. The research question is as follows:

(1) Does previously acquired knowledge and experience with cryptocurrencies impact the formation of opinions about them?

The following hypotheses has been developed:

H1: Perceived Benefits of cryptocurrencies are positively associated with the formation of opinions about them.

H2: Perceived Disadvantages of cryptocurrencies are negatively associated with the formation of opinions about them.

H3: Experience with cryptocurrencies is positively associated with the formation of opinions about them.

Based on the literature review and our previous research experience on cryptocurrencies, a conceptual framework was developed and is presented in Figure 1. The framework includes four latent variables: Experience, Perceived Benefits, Perceived Disadvantages, and Opinion Formation. Additionally, it depicts the associations between these latent variables.

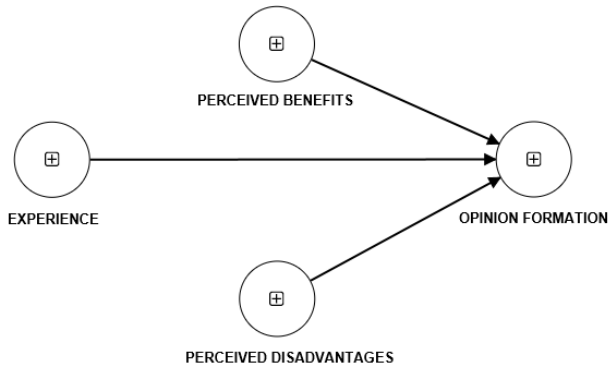

Figure 1: The Conceptual Framework

Research procedure

To address the primary research problems, answer research question, and verify formulated hypotheses, a quantitative research strategy was employed, wherein a questionnaire survey was administered. The research process comprised the following stages:

Initially, a preliminary survey questionnaire was developed to gather the opinions of students about cryptocurrencies, which included the queries about their prior experience with cryptocurrencies. The questions were constructed using a 5-points Likert scale, providing students with a list of options to choose from. In October 2021, the pilot survey was conducted, and the questionnaire underwent both substantive and methodological evaluations. Following this, the survey questionnaire was distributed online using LimeSurvey online platform, and data collection was conducted between November 2021 and February 2022. The sampling frame was deliberately restricted to university students, and the survey was conducted in two distinct university settings situated in different regions of Poland, i.e. the University of Warsaw, situated in the central region of Poland and the University of Economics in Katowice, located in the southern and most industrial region of Poland – Silesia. After screening the responses and eliminating outliers, a total of 778 accurate, complete, and valid questionnaires were obtained as the final research sample. The sample is presented in Table 2.

Table 2: Demographics of the Research Sample

Variable	Categories	Number of respondents	Percentage
University	University of Warsaw	382	49.1%
	University of Economics in Katowice	396	50.9%
Gender	females	413	53.1%
	males	365	46.9%
Age/ generation	X: 1965-1979	32	4.1%
	Y: 1980-1994	58	7.5%
	Z: 1995-2009	679	87.3%
Level of education	higher education	279	35.9%
	secondary education	499	64.1%

Source: Own elaboration.

The data were analyzed using SmartPLS package. The SmartPLS was used for estimating path models with latent variables and their relationships as well as to test hypotheses.

4. Results

4.1 Operationalization of Latent Variables

As depicted in Figure 1, the conceptual model comprises four latent variables, each of which is multifaceted and cannot be measured through a single observed variable. Therefore, we employed multiple observed items to

measure each latent variable within the conceptual model. The selection of specific items was based on the literature review. Table 3 presents the measurement items along with their corresponding latent variables.

Table 3: Measurement Items and Their Reliability

Constructs and their respective items	Factor loadings
Perceived Benefits (alpha: 0.63, CR: 0.78)	
[B1 DEC] - Decentralization	0.780
[B2 LTF] - Lower Transaction Fees	0.485
[B3 NI] - No Issuer	0.727
[B4 PRI] - Privacy	0.720
Perceived Disadvantages (alpha: 0.73, CR: 0.81)	
[D1 ENV] - Environmental Impact	0.548
[D2 LGAP] - Legislation gap	0.671
[D3 LOSS] - Potential loss	0.702
[D4 VOL] - Volatility	0.767
[D5 SECU] - Security Risks	0.720
Experience (alpha: 0.78, CR: 0.85)	
[E-min] - Experience in cryptocurrencies mining	0.571
[Ex-g] - General experience with cryptocurrencies	0.848
[Ex-t] - Experience in cryptocurrencies transactions	0.712
[Ex-w] - Experience in cryptocurrency wallets	0.888
Opinions Formation (alpha: 0.45, CR: 0.87)	
[Opi-EAG] - I am eager to perform activities aimed at cryptocurrencies	0.906
[Opi-REP] - In my view, cryptocurrencies have the potential to replace national currencies	0.668

Note: Loadings above 0.708 are recommended, as they indicate that the construct explains more than 50 per cent of the indicator's variance, thus providing acceptable item reliability (Hair et al., 2019). Alpha represents value of Cronbach's alpha, and CR represents composite reliability. As our research has partially exploratory nature and following Haier at al. (2019), reliability for exploratory research should be a minimum of 0.60, while reliability for research that depends on established measures should be 0.70 or higher.

The next step of the reflective measurement model assessment addresses the convergent validity of each construct measure. Convergent validity is the extent to which the construct converges to explain the variance of its items. The metric used is the average variance extracted (AVE) for all items on each construct. The AVE results vary from 0.5 to 0.63 and, thus, meet an acceptable AVE range that is 0.50 or higher, indicating that the constructs explain at least 50 per cent of the variance of its items (Sarstedt et al., 2022).

Discriminant validity was ensured by examining the cross-loadings of the indicators and applying the Fornell-Larcker criterion (see Table 4). Fornell and Larcker (1981) proposed that the Average Variance Extracted (AVE) of each construct should be compared to the squared inter-construct correlation, which represents the shared variance between that construct and all other reflectively measured constructs in the structural model. It is important to ensure that the shared variance among all model constructs is not greater than their respective AVEs.

Table 4: Fornell and Larcker Criterion

	PERCEIVED BENEFITS	PERCEIVED DISADVANTAGES	EXPERIENCE	OPINION FORMATION
PERCEIVED BENEFITS	0.687			
PERCEIVED DISADVANTAGES	0.027	0.686		
EXPERIENCE	0.274	-0.114	0.765	
OPINION FORMATION	0.335	-0.111	0.398	0.796

4.2 Structural Model

Figure 2 displays the structural model, indicating the beta values of all coefficients and the adjusted R2 for the dependent variables. The results regarding the estimated adequacy of the model are presented in Table 5.

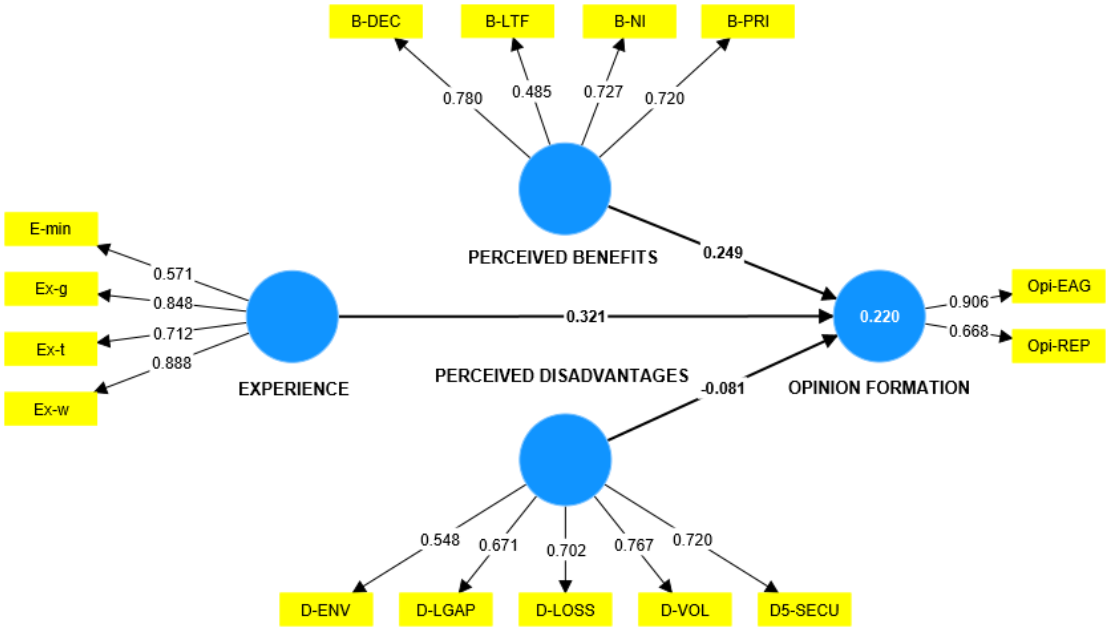

Figure 2: Structural Model

Figure 2 shows the PLS-SEM results. The numbers on the path relationships represent the standardized regression coefficients while the number displayed in the circle of the endogenous latent variable is the R2 value. An initial assessment shows that EXPERIENCE has the strongest effect (0.321) on OPINION FORMATION, followed by PERCEIVED BENEFITS (0.249) and PERCEIVED DISADVANTAGES (-0.081) for which the negative effect is displayed. These three constructs explain 22% (i.e., the R2 value) of the variance of the endogenous construct OPINION FORMATION.

Table 5: Model fit

	R-square	R-square adjusted
OPINION FORMATION	0.220	0.217
	Saturated model	**Estimated model**
SRMR	0.083	0.083
d_ULS	0.825	0.825
d_G	0.187	0.187
Chi-square	867.077	867.077
NFI	0.652	0.652

4.3 Hypotheses Testing – Bootstrapping

To test hypothesis *H1, H2, and H3* and answer *RQ1*, the Bootstrapping procedure was used. The process of bootstrapping is a non-parametric method utilized by PLS-SEM. It involves generating multiple artificial samples from the initial data using a significance level of 5%, as explained by Hair et al. (2011). In this particular study, a subset of 5,000 interactions was utilized to compute the t-values that evaluate the impact of the hypotheses relationships to be examined. The hypothesis is considered to have statistically significant results if the t-value is greater than 1.96 and the p-value is less than 0.5. The findings from the bootstrapping analysis, conducted with a 95% confidence level, including the mean, standard deviation, t-values, and p-values, are presented in Table 6.

Table 6: Hypotheses Testing

Hypothesis	Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	t Statistics (|O/STDEV|)	P Values	Decision
H1	PERCEIVED BENEFITS -> OPINION FORMATION	0.249	0.252	0.034	7.308	0.000	Supported
H2	PERCEIVED DISADVANTAGES -> OPINION FORMATION	-0.081	-0.091	0.032	2.502	0.012	Supported
H3	EXPERIENCE -> OPINION FORMATION	0.321	0.320	0.034	9.372	0.000	Supported

Table 6 presents the results, supporting all three hypotheses. H1 and H3 are supported, indicating a positive association between Perceived Benefits and Opinion Formation, as well as between respondents' Experience with cryptocurrencies and Opinion Formation. Additionally, H2 is supported, suggesting a negative association between Perceived Disadvantages and Opinion Formation.

5. Discussion and Conclusions

5.1 Research Contribution

Cryptocurrencies can be regarded as both technological and financial innovations (Kumar, 2018; Morewedge, 2021). Thus, this paper focuses on cryptocurrencies as a relatively new domain in which individuals can shape their opinions based on their experiences and the potential benefits and disadvantages.

This paper contributes to existing research on the impact of knowledge and experience on opinion formation by:

- Investigating the relationships among the analyzed constructs from the perspective of experience and knowledge within the context of cryptocurrencies.
- Exploring the association between Perceived Benefits of cryptocurrencies and opinion formation.
- Examining the link between Perceived Disadvantages of cryptocurrencies and opinion formation.
- Investigating the relationship between Experience with cryptocurrencies and opinion formation.

This study confirms that both the Perceived Benefits (path coefficient = 0.249, p-value > 0.05, t-value > 1.96) and Experience (path coefficient = 0.321, p-value > 0.05, t-value > 1.96) have a positive influence on Opinion Formation regarding cryptocurrencies. The study also confirms that the Perceived Disadvantages (path coefficient = -0.081, p-value > 0.05, t-value > 1.96) have a negative influence on Opinion Formation.

According to the results obtained and supported by studies conducted by Rapanos (2023), Lee, Yang, & Kim (2022), Berthet (2022), and Kuppens et al. (2023), individuals' experiences can influence how they form their own opinions on a particular issue.

This paper is among the first to analyze cryptocurrencies in the context of opinion formation, taking into account individuals' experiences, as well as the perceived benefits and disadvantages associated with cryptocurrencies from a broader perspective. The study aims to understand how individuals' domain experiences, perceived

benefits, and disadvantages can shape their perceptions of cryptocurrencies and the opinions they form about them.

Considering the practical implications of this study, it becomes crucial to understand the factors that influence opinion formation. As the cryptocurrency market and related issues are still new, rapidly changing, and complex for many, comprehending the factors that impact opinion formation on them can be vital for organizations seeking to manage the opinions of employees, consumers, and other stakeholders.

5.2 Limitations of the Results

There are several limitations to our study. Firstly, we only considered selected variables. This means that our findings cannot be generalized to all aspects of the cryptocurrency market. Secondly, our study was conducted among young people, specifically students. This may limit the applicability of our results to other age groups who may have different perspectives and behaviors towards cryptocurrencies. Lastly, we treated the entire cryptocurrency market as a single entity, without examining individual cryptocurrencies or their specific characteristics. Therefore, our findings may not provide a complete understanding of the nuances and complexities of individual cryptocurrencies or their impact on the market. Future research should consider examining individual cryptocurrencies in greater detail to provide a more comprehensive understanding of the cryptocurrency market.

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