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A BIBLIOMETRIC ANALYSIS OF EMPIRICAL STUDIES ON CRYPTOCURRENCIES IN THE TIME OF COVID-19

Kaan YİĞENOĞLU[1]

Ayhan CESUR[2]

Zübeyir ÇELİK[3]

İbrahim AYDIN[4]

Abstract

During the COVID-19 pandemic, the uncertainty in the markets was also reflected in the demand for cryptocurrencies. This study aims to visually present the bibliometric analyzes of empirical studies on cryptocurrencies during the COVID-19 pandemic period (between 2020-2022). For this purpose, VOSviewer software was used to perform a bibliometric analysis of 30 selected studies. According to the results obtained, it is seen that the selected studies are mostly scanned in the SCOPUS and SSCI indexes of the journals published. Most studies were conducted in Malaysia, followed by Pakistan and Spain. 7 studies were conducted in Malaysia and 3 studies each in Pakistan and Spain. In the studies, it was seen that the technology acceptance model, planned behavior theory, and unified theory of acceptance and use of technology were used the most, respectively. Structural equation modeling was used in 23 studies. When the variables used were examined, it was understood that the most used variables were the intention, risk, trust, and attitude. Considering the uncertainties in the pandemic period and the characteristics of cryptocurrencies, it is thought that the variables used to make significant contributions to the literature and relevant persons.

Keywords: Time of COVID-19, Cryptocurrencies, Empirical Studies, Bibliometric Analysis.

1Araş. Gör., Van Yüzüncü Yıl Üniversitesi, E-posta: kaanyigenoglu@yyu.edu.tr, ORCID: 0000-0002-1961-6601.

2Dr. Öğr. Ü, Van Yüzüncü Yıl Üniversitesi, E-posta: ayhancesur@yyu.edu.tr, ORCID: 0000-0003-4305-3930.

3Araş. Gör. Dr., Van Yüzüncü Yıl Üniversitesi, E-posta: zubeyircelik@yyu.edu.tr, ORCID: 0000-0003-1692-9378.

4Doç. Dr., Van Yüzüncü Yıl Üniversitesi, E-posta: ibrahimaydin@yyu.edu.tr, ORCID: 0000-0002-0720-364X.

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COVİD-19 ZAMANINDA KRİPTO PARA BİRİMLERİ İLE İLGİLİ YAPILAN AMPİRİK ÇALIŞMALARIN BİBLİYOMETRİK ANALİZİ

Öz

COVID-19 pandemisi döneminde piyasalardaki belirsizlik kripto para talebine de yansımıştır. Bu çalışma, COVID-19 pandemisi döneminde (2020-2022 arası) kripto para birimleri ile ilgili yapılan ampirik çalışmaların bibliyometrik analizlerini görsel olarak sunmayı amaçlamaktadır. Bu amaç doğrultusunda seçilen 30 çalışmanın bibliyometrik analizini gerçekleştirmek amacıyla VOSviewer yazılımı kullanılmıştır. Elde edilen sonuçlara göre seçilen çalışmaların yayımladıkları dergilerin en fazla SCOPUS ve SSCI indekslerinde tarandığı görülmektedir. En çok çalışma Malezya'da, Malezya'dan daha sonra Pakistan ve İspanya'da yapılmıştır. Malezya'da 7 çalışma, Pakistan ve İspanya'da ise 3'er çalışma yapılmıştır. Çalışmalarda sırasıyla en fazla teknoloji kabul modeli, planlı davranış teorisi ve birleşik teknoloji kabul ve kullanım teorisinin kullanıldığı görülmüştür. 23 çalışmada yapısal eşitlik modellemesi kullanılmıştır. Kullanılan değişkenlere bakıldığında ise en fazla kullanılan değişkenlerin niyet, risk, güven ve tutum olduğu anlaşılmıştır. Pandemi dönemindeki belirsizlikler ve kripto paraların özellikleri göz önüne alındığında kullanılan değişkenlerin literatüre ve konuyla ilgili kesimlere önemli katkılar sunduğu düşünülmektedir.

Anahtar Kelime: COVID-19 Zamanı, Kripto Para Birimi, Ampirik Çalışmalar, Bibliyometrik Analiz

INTRODUCTION

Cryptocurrency is a new sort of money that is built on the blockchain technology (Miraz et al., 2022) and has begun to replace financial transactions in a short time (Albayati et al., 2020; Gil-Cordero et al., 2020; Saiedi et al., 2020, p. 354) and this trend is expected to continue in this way (Cristofaro et al., 2022). There are around 2,000 bitcoin traders in the market (Abbasi et al., 2021, p.2) and the global crypto market has grown from USD $190 billion to over $1.7 trillion in the last two years (Martin et al., 2022a). There are no agencies backing, regulating, or monitoring cryptocurrencies (Ooi et al., 2021, p. 1220), and they are assets that are bought and sold online via a blockchain-based public network, providing potential gains with speculative risk (Martin et al., 2022b).

Bibliometric analysis, which is a statistical method for measuring the outputs of individuals, institutions, and countries, revealing the networks between them and mapping all these by visualizing, is used to give an overview of the studies in this field in parallel with the increase in the use of cryptocurrencies (Guo et al., 2021, p. 317). Through bibliometric analysis, it is possible to search for sources that can provide guidance to new sources. It also provides important references for researchers who intend to study a specific topic (Hernández-Perlines et al., 2022). The increase in cryptocurrency studies in recent years has increased the importance of bibliometric analysis in this field. There are bibliometric studies about

cryptocurrency in the literature (Alsmadi et al., 2022; Aslanidis et al., 2022; Aysan et al., 2021; Bariviera et al., 2021; Corbet & Lucey, 2020; Garcia‐Corral et al., 2022; Guo et al., 2021; Hossain, 2021; Jalal et al., 2021; Jiang et al., 2021; Kamran et al., 2020; Miau & Yang, 2018; Nasır et al., 2021; Nasution & Aswad, 2021; Yue et al., 2021). However, there is no study examining the development of cryptocurrencies bibliometrically during the pandemic period

As a result, the goal of this study is to conduct a systematic analysis of empirical studies on cryptocurrencies from the beginning of the COVID-19 pandemic to the present day, using a visualization created with VOSviewer. Thus, it will be ensured that the development of the relevant literature in the 2020–2022 period is understood. The rest of this paper is structured as follows. The next section includes explanations of the general situation of cryptocurrencies during the COVID-19 period. The third section presents materials and methods. The results part is explained in the fourth section. Finally, there is the discussion part.

1. CRYPTOCURRENCIES IN THE TIME OF COVID-19

Cryptocurrency was launched in 2008, one year after it was introduced by Satoshi Nakamoto (Ayedh et al., 2021, p. 691). Cryptocurrencies, as digital currencies based on blockchain technology using cryptographic techniques (Arias-Oliva et al., 2021, p. 1; Arli et al., 2020, p. 76), have no physical existence and are traded on the internet. Blockchain-based transactions have three stages: The first stage is the initiation stage, in which a consumer transacts financial assets to gain access to the blockchain network; the second stage is the integration of participants for asset verification; and the third stage is the use of a blockchain ledger to keep track of transactions. These stages have concentrated on four characteristics of financial transactions: asset verification, transaction record management, data privacy, and transaction costs (Jariyapan et al., 2021). They are a form of money creation that is not governed by central banks (Anser et al., 2020, p. 1). Its distinguishing characteristics (such as privacy, autonomy, and control) may influence buyers' perspectives of forthcoming bitcoin transactions (Hasan et al., 2022).

Financial assets have been the focus of studies since 2020 (Yarovaya et al., 2020a), when the impact of the pandemic began to be felt around the world, which caused significant economic costs by affecting financial markets (Goodell, 2020). The performance of cryptocurrencies, which is a financial asset, is affected by the pandemic and has also become the subject of studies (Vidal-Tomás, 2021). While the pandemic outbreak has increased volatility in

cryptocurrency markets, it has had little effect on herding (Yarovaya et al., 2020b). In comparison to equities, cryptocurrency markets showed more unpredictability and irregularity during the pandemic (Lahmiri & Bekiros, 2020, p. 6).

In particular, Bitcoin and Ethereum stand out as the cryptocurrencies most affected by the pandemic in terms of efficiency (Nadeem et al., 2021a, p. 10). After the pandemic broke out, Bitcoin, which was the most efficient before the pandemic, became less efficient than Ethereum after the pandemic broke out (Mnif et al., 2020, p. 13). At the beginning of the pandemic, steady increases were seen in the value of Bitcoin (Gafar et al., 2021, p. 8). The pandemic has also caused changes in the perceptions of cryptocurrency users. For example, users who wanted to reduce their physical contact during the pandemic perceived cryptocurrency as money rather than technology (Kim, 2021, p.8; Wu et al., 2022, p.3). In addition, the uncertainties caused by the pandemic have led to the increased use of cryptocurrencies (Cristofaro et al., 2022) and the rise of cryptocurrencies as safe havens (Conlon et al., 2020; Corbet et al., 2020; Corbet et al., 2021; Yarovaya et al., 2020a). Another study shows a change in long-term dependency for most cryptocurrencies, with a dramatic drop after the pandemic (Assaf et al., 2022).

2. MATERIALS AND METHODS

This study aims to present bibliometric data sources with a visual mapping technique of empirical studies on cryptocurrencies, which are research models/ hypotheses published in ESCI, SCOPUS, SSCI, and/or SCIE indexed journals during the COVID-19 period (between 2020 and 2022). Studies published between 2020 and 2022 were reached by searching the cryptocurrency keyword directly related to the research topic in the Google Scholar database (Snyder, 2019). Although it is not possible to reach all studies through the Google Scholar database, this decision is necessary for a systematic review of the relevant literature in a reasonable time (Cruz-Cárdenas et al., 2021). Considering the source type, design/organization, method and results of the reached study, it was decided whether it would be selected for this study (Littell et al., 2008). Although there are bibliometric analyses conducted with 17 studies in the literature (Reyes-Menendez et al., 2019), 30 studies were used in this study. As a result, 30 empirical studies with research models/hypotheses published in journals with leading indexes were selected for this study. The bibliometric data sources for 30 studies were mapped using the VOSviewer software program (Van Eck &

Waltman, 2010). Visual mappings of bibliometric data sources from selected studies are presented and evaluated in the following pages.

3. RESULTS

3.1. Selected Studies

The studies selected for this study and the frequency results of these studies are given in Table 1. A total of 30 studies (100%) were selected for this study. Of the total studies selected for this study, 7 studies (23.3%) were published in 2020, 13 studies (43.3%) were published in 2021, and 10 studies (33.3%) were published in 2022.

Table 1. Selected Studies

Documents=30			
Year	**Selected Studies**	**f**	**%**
2020	Albayati et al. (2020); Anser et al. (2020); Arli et al. (2020); Gil-Cordero et al. (2020); Saiedi et al. (2020); Sun et al. (2020); Yoo et al. (2020)	7	23.3
2021	Abbasi et al. (2021); Arias-Oliva et al. (2021); Ayedh et al. (2021); Gafar et al. (2021); Jariyapan et al. (2021); Kim (2021); Mnif et al. (2021); Nadeem et al. (2021b); Ooi et al. (2021); Palos-Sánchez et al. (2021); Salcedo & Gupta (2021); Ter Ji-Xi et al. (2021); Zhao & Zhang (2021)	13	43.3
2022	Cristofaro et al. (2022); Hasan et al. (2022); Koroma et al. (2022); Martin et al. (2022a); Martin et al. (2022b); Miraz et al. (2022); Schaupp et al. (2022); Soomro et al. (2022); Wu et al. (2022); Yeong et al. (2022)	10	33.3

Figure 1 shows co-occurrences for selected studies. The year 2021 is a co-occurrence when studies are widely published.

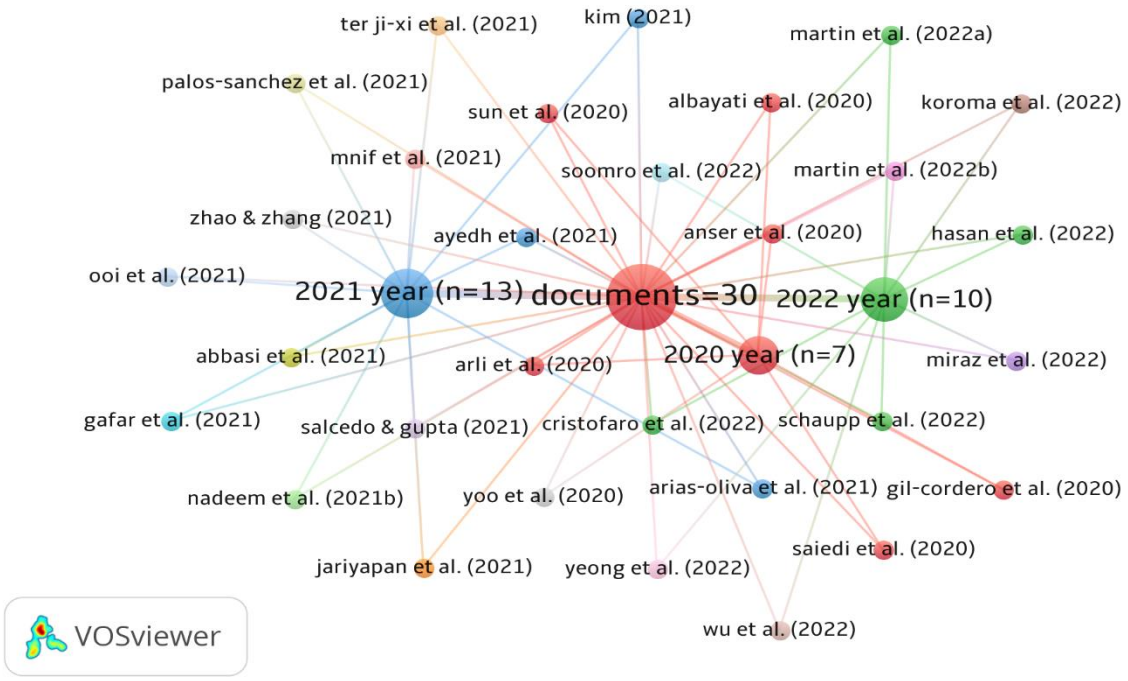

Figure 1. Co-Occurrences for Selected Studies

3.2. Journal Indexes of Studies

The frequency analysis results regarding the journal indexes and in which journal indexes the selected studies were published are given in Table 2. Journals have ESCI, SCOPUS, SSCI, SCI and/or SCIE indexes. Among the thirty studies selected for this study, studies were published in "SCOPUS and SSCI indexed journals (n=12; 40.0%)", "ESCI and SCOPUS indexed journals (n=5; 16.7%)", "SCOPUS and SCIE indexed journals (n=5; 16.7%)", "only ESCI indexed journals (n=3; 10.0%)", "only SCOPUS indexed journals (n=3; 10.0%)", "SCOPUS and SCI indexed journals (n=1; 3.3%)" or "SCOPUS, SCIE and SSCI indexed journals (n=1; 3.3%)".

Table 2. Journal Indexes of Studies

Documents=30					
Journal Indexes	**f**	**%**	**Journal Indexes**	**f**	**%**
ESCI	3	10.0	SCOPUS and SCIE	5	16.7
SCOPUS	3	10.0	SCOPUS and SSCI	12	40.0
ESCI and SCOPUS	5	16.7	SCOPUS, SCIE and SSCI	1	3.3
SCOPUS and SCI	1	3.3			

Figure 2 shows co-occurrences for journal indexes of selected studies. The journals with the SCOPUS and SSCI index are the most co-occurrence for selected studies.

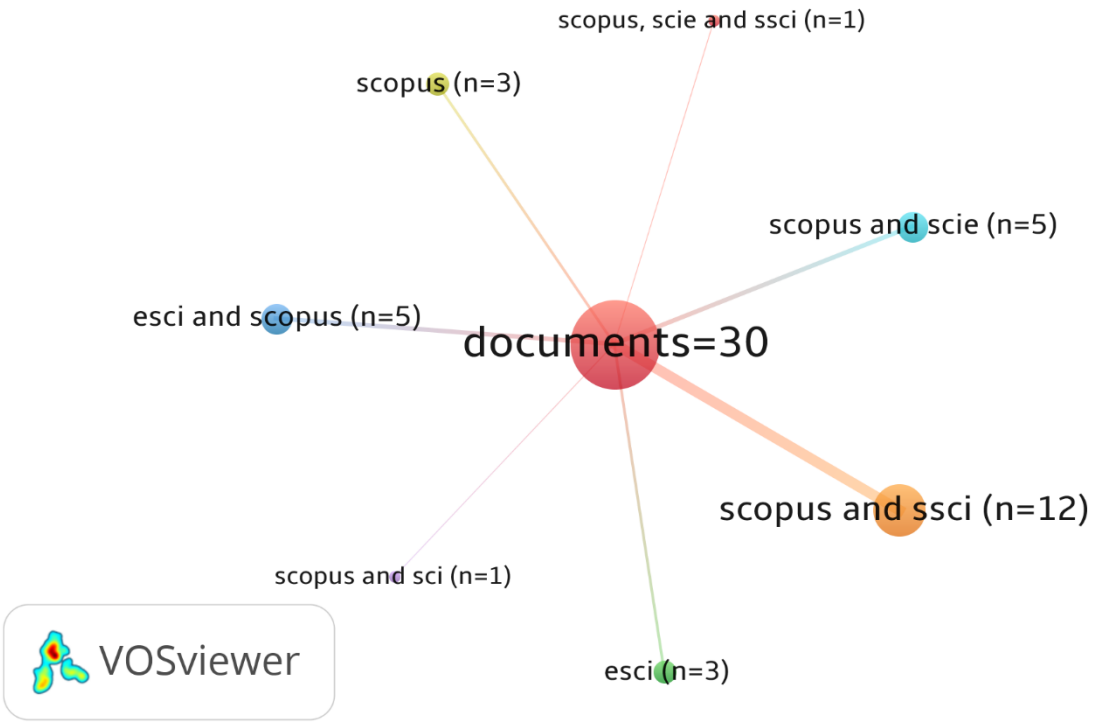

Figure 2. Co-Occurrences for Journal Indexes of Studies

3.3. Countries of Studies

The frequency analysis results for the countries where the studies were conducted are given in Table 3. Studies were conducted in Malaysia (n=7; 23.3%), Pakistan (n=3; 10%), Spain (n=3; 10%), China (n=2; 6.7%), USA (n=2; 6.7%), South Korea (n=1; 3.3%) or concurrently USA and China (n=1; 3.3%), South Korea and China (n=1; 3.3%) or Mano River Union States (n=1; 3.3%). However, it should be noted that there is no information about the country or countries where some studies were conducted (n=9; 30%). In conclusion, while it is seen that some of the selected studies are carried out either at the national or international level, the country where some studies are carried out is not known exactly.

Table 3. Countries of Studies

Documents=30					
Countries	**f**	**%**	**Countries**	**f**	**%**
China	2	6.7	South Korea and China	1	3.3
Malaysia	7	23.3	Spain	3	10.0
Mano River Union States	1	3.3	Unknown	9	30.0
Pakistan	3	10.0	USA	2	6.7
South Korea	1	3.3	USA and China	1	3.3

The co-occurrences for the countries in which the studies were conducted are presented in Figure 3. It is clear that Malaysia is the place where the most studies co-occurrence with seven studies. However, it should be noted that the country (national) or countries (international) in which the nine studies were conducted are unknown.

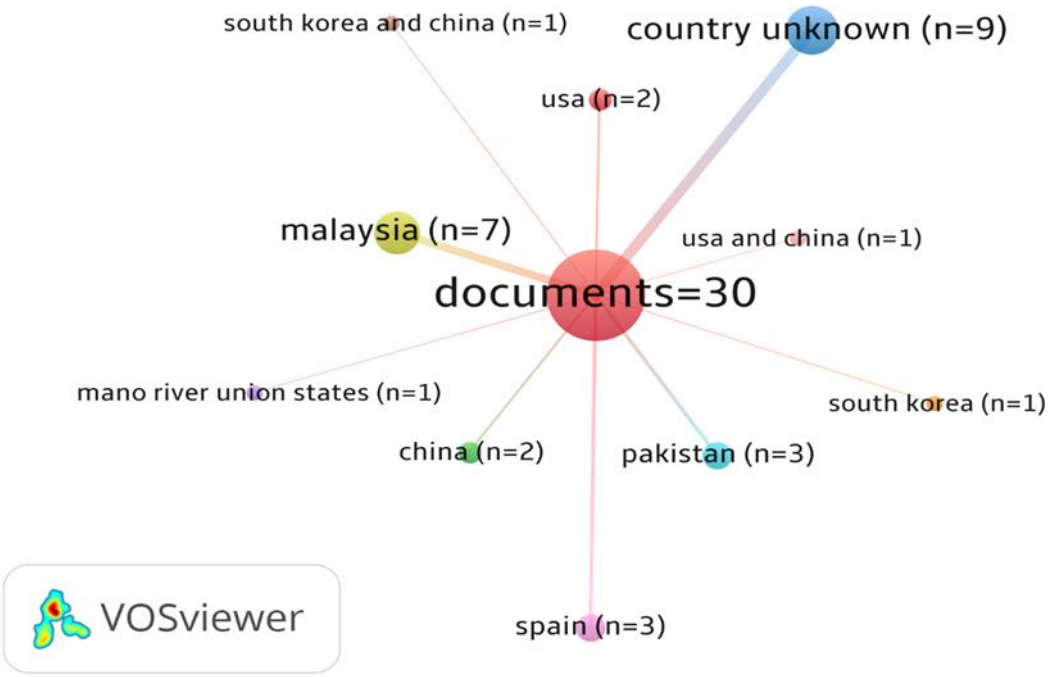

Figure 3. Co-Occurrences for Countries of Studies

3.4. Theoretical Foundations of Studies

The frequency analysis results for the theoretical basis of the studies are given in Table 4. The technology acceptance model (n=9; 30%), theory of planned behavior (n=8; 26.7%), unified theory of acceptance and use of technology (n=6; 20%), Hofstede's cultural dimensions theory (n=2; 6.7%), innovation diffusion theory (n=2; 6.7%), benefit-risk concept (n=1; 3.3%), commitment trust theory (n=1; 3.3%), financial innovation theory (n=1; 3.3%), psychological reactance theory (n=1; 3.3%), push-pull-mooring (PPM hereafter) theory (n=1; 3.3%), reinforcement sensitivity theory (n=1; 3.3%), social cognitive theory (n=1; 3.3%), stimulus-organism-response (n=1; 3.3%), transaction cost theory (n=1; 3.3%), trust transfer theory (n=1; 3.3%), and utility theory (n=1; 3.3%) are the models/theories used in selected studies.

Table 4. Theoretical Foundations of Studies

Documents=30		
Models/Theories	**f**	**%**
Benefit-risk concept	1	3.3
Commitment trust theory	1	3.3
Financial innovation theory	1	3.3
Hofstede's cultural dimensions theory	2	6.7
Innovation diffusion theory	2	6.7
Psychological reactance theory	1	3.3
Push-pull-mooring (PPM hereafter) theory	1	3.3
Reinforcement sensitivity theory	1	3.3
Social cognitive theory	1	3.3
Stimulus-organism-response	1	3.3
Technology acceptance model	9	30.0
Theory of planned behavior	8	26.7
Transaction cost theory	1	3.3
Trust transfer theory	1	3.3
Unified theory of acceptance and use of technology	6	20.0
Utility theory	1	3.3

The co-occurrences of the models/theories used for the theoretical foundations of the studies are presented in Figure 4. The technology acceptance model was used the most, with nine studies out of thirty studies. Among these theories/models, the technology acceptance model and the theory of planned behavior are co-occurrences used simultaneously in selected studies. On the other hand, for example, there are studies in which the theory of planned behavior, innovation diffusion theory, benefit-risk concept, and transaction cost theory are used simultaneously.

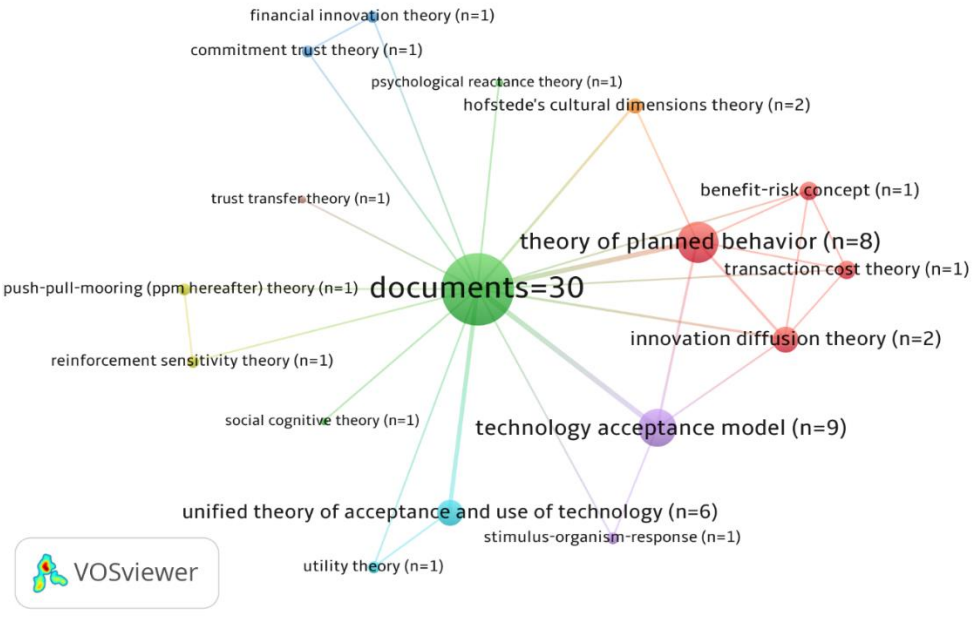

Figure 4. Co-Occurrences for Theoretical Foundations of Studies

3.5. Methodology of Studies

The frequency analysis results for the methodology of the studies are given in Table 5. While the samples of some studies are MTurk workers (n=3; 10%), business executives (n=1; 3.3%), conimap data (n=1; 3.3%), individual investors (n=1; 3.3%), twitter users (n=1; 3.3%), university students (n=1; 3.3%), however, the number of studies with mixed samples is higher (n=22; 73.3%). Although there are panel data (n=2; 6.7%), the number of studies in which data was collected by survey is more (n=28; 93.3%). There are an equal number of studies with a sample size greater than 384 (n=15; 50%) or less than 384 (n=15; 50%). Finally, PLS-SEM (n=14; 46.7%), AMOS-SEM (n=9; 30%), ANOVA (n=3; 10%), regression analysis (n=3; 10%), process macro (n=2; 6.7%), artificial neural network analysis (n= 1; 3.3%), fuzzy set qualitative comparative analysis (n=1; 3.3%), importance-performance map analysis (n=1; 3.3%), Jarque-Bera test (n=1; 3.3%), Kruskal-Wallis test (n=1; 3.3%), lexicon-based sentiment analysis (n=1; 3.3%), Tobit regression model (n=1; 3.3%) and or t-test (n=1; 3.3%) were performed for the obtained data.

Table 5. Methodology of Studies

Documents=30					
Sampling unit	**f**	**%**	**Analysis method**	**f**	**%**
MTurk workers	3	10.0	AMOS-SEM	9	30.0
Business executives	1	3.3	PLS-SEM	14	46.7
Conimap data	1	3.3	ANOVA	3	10.0
Individual investors	1	3.3	Kruskal-Wallis test	1	3.3
Twitter users	1	3.3	t-test	1	3.3
University students	1	3.3	Regression analysis	3	10.0
Mixed	22	73.3	Tobit regression model	1	3.3
Data collection method	**f**	**%**	Process macro	2	6.7
Panel data	2	6.7	Artificial neural network analysis	1	3.3
Survey	28	93.3	Fuzzy set qualitative comparative analysis	1	3.3
Sample size	**f**	**%**	Importance-performance map analysis	1	3.3
Less than 384	15	50.0	Jarque-Bera test	1	3.3
Greater than 384	15	50.0	Lexicon-based sentiment analysis	1	3.3

Figure 5 shows the co-occurrences for the methodology of the studies. Although different analysis techniques were performed simultaneously in the same studies for the data obtained, the PLS-SEM analysis technique was performed for the data obtained in the most studies. As a result, mixed samples, survey, 384> or 384< sample size, and PLS-SEM are co-occurrences for selected studies.

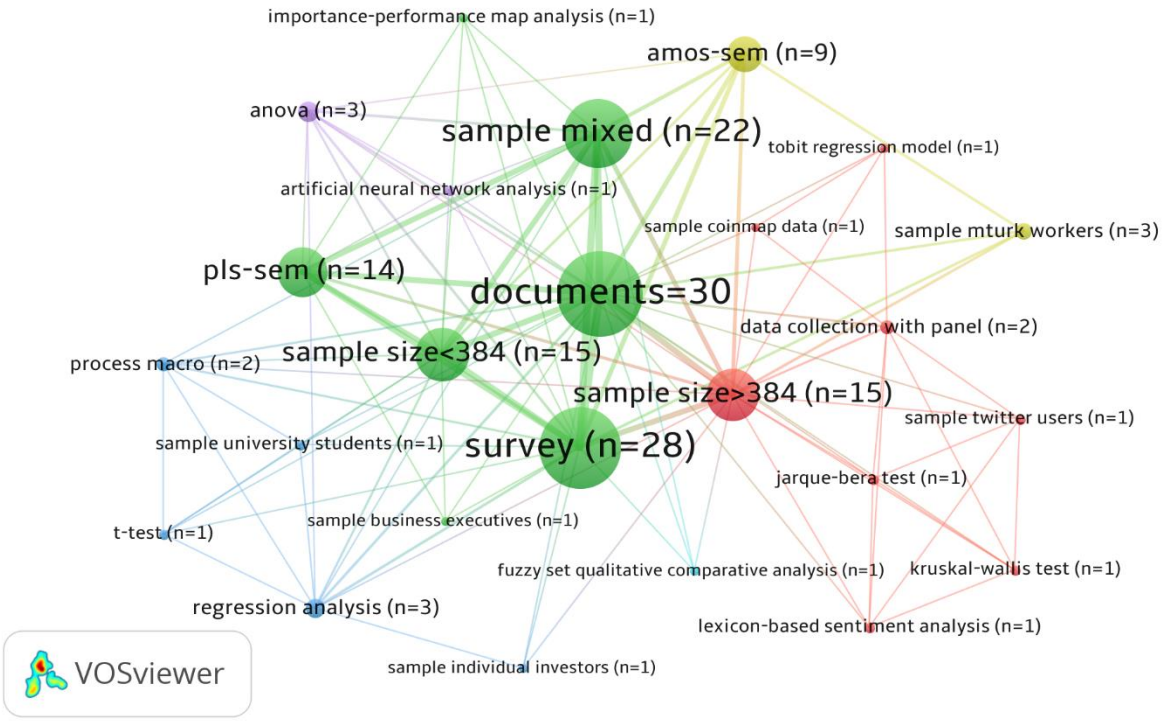

Figure 5. Co-Occurrences for Methodology of Studies

3.6. Variables of Studies

The variables of the studies are given in Table 6. The ninety variables evaluated are as follows: Intention (n=23; 76.7%), risk (n=13; 43.3%), trust (n=13; 43.3%), attitude (n=10; 33.3%), behavior (n=7; 23.3%), facilitating conditions (n=7; 23.3%), subjective norm (n=7; 23.3%), ease of use (n=6; 20%), performance expectancy (n=6; 20%), social influence (n=6; 20%), behavioral control (n=5; 16.7%), self-efficacy (n=5; 16.7%), usefulness (n=5; 16.7%), compatibility (n=4; 13.3%), effort expectancy (n=4; 13.3%), financial literacy (n=4; 13.3%), innovativeness (n=4; 13.3%), security (n=4; 13.3%), anxiety (n=3; 10%), experience (n=3; 10%), regulatory support (n=3; 10%), transparency (n=3; 10%), age (n=2; 6.7%), anger (n=2; 6.7%), benefit (n=2; 6.7%), collectivism/individualism (n=2; 6.7%), gender (n=2; 6.7%), hedonic motivation (n=2; 6.7%), high/low power distance (n=2; 6.7%), knowledge (n=2; 6.7%), long/short term orientation (n=2; 6.7%), price (n=2; 6.7%), quality (n=2; 6.7%), transaction processing (n=2; 6.7%), value (n=2; 6.7%), anticipation (n=1; 3.3%), awareness (n=1; 3.3%), competition (n=1; 3.3%), complexity (n=1; 3.3%), conspiracy beliefs (n=1; 3.3%), cost (n=1; 3.3%), dependent children (n=1; 3.3%), design (n=1; 3.3%), disguist (n=1; 3.3%), distrust (n=1; 3.3%), education level (n=1; 3.3%), employment status (n=1; 3.3%), ethical issue (n=1; 3.3%), external influence (n=1; 3.3%), e-wom (n=1; 3.3%), fear (n=1;

3.3%), fear of missing out (n=1; 3.3%), financial population (n=1; 3.3%), herding behavior (n=1; 3.3%), inflation crises (n=1; 3.3%), interpersonal influence (n=1; 3.3%), involvement (n=1; 3.3%), joyfulness (n=1; 3.3%), loyalty (n=1; 3.3%), machiavellianism (n=1; 3.3%), marital status (n=1; 3.3%), masculinity/femininity (n=1; 3.3%), money-laundering activities (n=1; 3.3%), narcissism (n=1; 3.3%), network (n=1; 3.3%), observability (n=1; 3.3%), positive affect (n=1; 3.3%), positivity (n=1; 3.3%), power-prestige (n=1; 3.3%), privacy (n=1; 3.3%), procedures (n=1; 3.3%), profitability (n=1; 3.3%), protections (n=1; 3.3%), psychopathy (n=1; 3.3%), race/ethnicity (n=1; 3.3%), retention-time (n=1; 3.3%), reward sensitivity (n=1; 3.3%), rule of law (n=1; 3.3%), sadism (n=1; 3.3%), sadness (n=1; 3.3%), social media (n=1; 3.3%), speed (n=1; 3.3%), structural provision (n=1; 3.3%), surprise (n=1; 3.3%), technology attachment (n=1; 3.3%), technostress (n=1; 3.3%), trait reactance (n=1; 3.3%), trialability (n=1; 3.3%), uncertainty avoidance (n=1; 3.3%), and volatility (n=1; 3.3%).

Table 6. Variables of Studies

Documents=30					
Variables	**f**	**%**	**Variables**	**f**	**%**
Intention	23	76.7	Education level	1	3.3
Risk	13	43.3	Employment status	1	3.3
Trust	13	43.3	Ethical issue	1	3.3
Attitude	10	33.3	External influence	1	3.3
Behavior	7	23.3	E-wom	1	3.3
Facilitating conditions	7	23.3	Fear	1	3.3
Subjective norm	7	23.3	Fear of missing out	1	3.3
Ease of use	6	20.0	Financial population	1	3.3
Performance expectancy	6	20.0	Herding behavior	1	3.3
Social influence	6	20.0	Inflation crises	1	3.3
Behavioral control	5	16.7	Interpersonal influence	1	3.3
Self-efficacy	5	16.7	Involvement	1	3.3
Usefulness	5	16.7	Joyfulness	1	3.3
Compatibility	4	13.3	Loyalty	1	3.3
Effort expectancy	4	13.3	Machiavellianism	1	3.3
Financial literacy	4	13.3	Marital status	1	3.3
Innovativeness	4	13.3	Masculinity/femininity	1	3.3
Security	4	13.3	Money-laundering activities	1	3.3
Anxiety	3	10.0	Narcissism	1	3.3
Experience	3	10.0	Network	1	3.3
Regulatory support	3	10.0	Observability	1	3.3
Transparency	3	10.0	Positive affect	1	3.3
Age	2	6.7	Positivity	1	3.3
Anger	2	6.7	Power-prestige	1	3.3
Benefit	2	6.7	Privacy	1	3.3
Collectivism/individualism	2	6.7	Procedures	1	3.3
Gender	2	6.7	Profitability	1	3.3
Hedonic motivation	2	6.7	Protections	1	3.3
High/low power distance	2	6.7	Psychopathy	1	3.3

Knowledge	2	6.7	Race/ethnicity	1	3.3
Long/short term orientation	2	6.7	Retention-time	1	3.3
Price	2	6.7	Reward sensitivity	1	3.3
Quality	2	6.7	Rule of law	1	3.3
Transaction processing	2	6.7	Sadism	1	3.3
Value	2	6.7	Sadness	1	3.3
Anticipation	1	3.3	Social media	1	3.3
Awareness	1	3.3	Speed	1	3.3
Competition	1	3.3	Structural provision	1	3.3
Complexity	1	3.3	Surprise	1	3.3
Conspiracy beliefs	1	3.3	Technology attachment	1	3.3
Cost	1	3.3	Technostress	1	3.3
Dependent children	1	3.3	Trait reactance	1	3.3
Design	1	3.3	Trialability	1	3.3
Disguist	1	3.3	Uncertainty avoidance	1	3.3
Distrust	1	3.3	Volatility	1	3.3

Figure 6 shows the co-occurrences for the variables evaluated in the studies. Intention was the most evaluated variable, with twenty-three of the thirty studies. As a result, the intention variable is the most co-occurrences with other variables in selected studies.

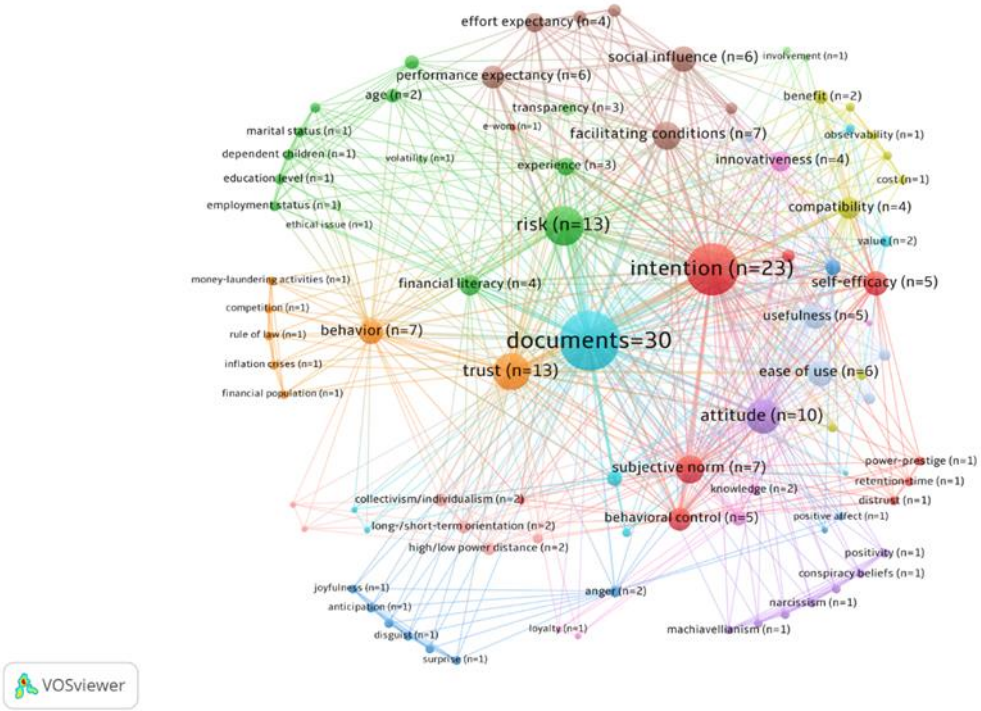

Figure 6. Co-Occurrences for Variables of Studies

CONCLUSION

The COVID-19 pandemic has affected all areas of life, as well as the cryptocurrency market. The COVID-19 pandemic, which is described as a black swan event in economic terms, has had profound effects on the economy and finance. It is not surprising that there was a difference in the demand for cryptocurrencies in this period, when people were looking for a safe haven, estimations are very difficult or even unpredictable, compared to the period before the COVID-19 pandemic. Arouxet et al. (2022) stated that the COVID-19 pandemic had a major impact on the volatility of cryptocurrencies in particular. For this reason, it is considered important bibliometric analysis of empirical studies on cryptocurrencies in the COVID-19 period was made and variables, the country where the study was conducted in these studies, etc. to obtain information. Accordingly, 30 studies scanned in ESCI, SCOPUS, SSCI, and/or SCIE indexes were selected and bibliometric analysis was performed.

7 of the selected studies were published in 2020, 13 in 2021, and 10 in 2022. When the indexes of the journals published by the studies are examined, it is seen that the journals with SCOPUS and SSCI indexes have the highest number. Studies have been published in 12 SCOPUS and SSCI indexed journals. With 7 studies, the most studies were conducted in Malaysia, and after Malaysia, the most studies were conducted in Pakistan and Spain with 3 each. It is thought that the reason why most of the studies are conducted in Malaysia is due to the high level of cryptocurrency awareness among Malaysians compared to global cryptocurrency awareness (Sooi, 2022) and the high adoption of cryptocurrencies in Malaysia recently (Madavaram, 2022). When we look at the models/theories used for the theoretical foundations of the studies, it was seen that the technology acceptance model was used in 9 studies, the planned behavior theory in 8 studies, and the unified theory of acceptance and use of technology in 6 studies. Researching whether cryptocurrencies, which are relatively technological innovation, are accepted among people has attracted the attention of researchers during the pandemic period. Another issue that attracts the attention of researchers is how people's behaviors such as intention, attitude, and risk toward cryptocurrencies are shaped. In this context, the theory of planned behavior theory was used. The theory of unified theory of acceptance and use of technology, which aims to explain people's tendencies and use behaviors of cryptocurrencies, is another model that is used extensively in studies during the pandemic period. Other theories/models were also used in the studies, but they were used

much less than the 3 theories/models mentioned above. Structural equation modeling was the most used analysis method in studies, PLS-SEM (n=14) and AMOS-SEM (n=9). When the most frequently used variables in the studies were examined, it was seen that intention in 23 studies, risk in 13 studies, trust in 13 studies, and attitude variables in 10 studies. In this period, which is quite uncertain for investors, it is thought that researching people's risk perception and confidence in these currencies, as well as people's intention to buy crypto money and their attitudes towards these currencies, both contributed to the literature and provided insights for investors and market owners.

The expectations and needs of the literature and the people related to the subject change for each subject and each period. In the empirical studies on cryptocurrencies during the COVID-19 pandemic period, the technology acceptance model and variables such as intention and risk have been used. Considering the features of crypto money and the conditions of the pandemic period, it is thought that the used models and variables are used correctly depending on the current situation, add richness to the studies, and provide valuable information to the literature and people related to the subject.

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