A Bibliometric Analysis of Cryptocurrency and Blockchain

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ABSTRACT

Cryptocurrency and blockchain technology have changed the financial environment, giving decentralized and secure alternatives to existing institutions. Cryptocurrencies, like Bitcoin and Ethereum, leverage blockchain as a distributed ledger to record transactions openly and immutably. The blockchain's decentralized structure maintains trust and removes the need for middlemen, boosting efficiency and decreasing fraud risks. Cryptocurrencies allow borderless and fast transactions, encouraging financial inclusion internationally. Despite their transformational potential, problems such as regulatory uncertainty and environmental concerns surround cryptocurrencies. The continued advancement of this revolutionary technology has spurred questions about its long-term implications on finance, government, and beyond. As the world continues to explore the huge potential of cryptocurrencies and blockchain, their disruptive effect on numerous sectors remains a major topic of attention and controversy.

Keywords: Bibliometrics, Cryptocurrency, Blockchain, VOSviewer

1. INTRODUCTION

The blockchain acts as a decentralized database, wherein all transactions are recorded in a chronological and immutable manner. Each block in the chain holds a cryptographic hash of the preceding block, which guarantees the integrity of the ledger and makes any illegal alteration or data tampering exceedingly improbable [1] Cryptocurrency is a new form of money that is founded on the blockchain technology and has begun to replace financial transactions in a short period and this trend is predicted to continue in this way[2] The openness and ethical business philosophy also can be attained clearly by the public bookkeeping function of blockchain technology [3] The usage of technology-based information is now not only employed as a source of knowledge but has become a commodity in the realm of trade. Information technology in the transaction industry, including economic aspects, is increasingly growing to facilitate payments other than cash and gyral. This has led to different inventions that are increasingly effective, efficient, safe, rapid, and convenient [4] Interest in cryptocurrencies can be assigned to the previous decade's blooming of focus towards the technological and monetary features of such assets [5]

A vast spectrum of terminologies are coined to diferentiate between different cryptocurrencies, ranging from virtual complementary money to electronic currency and its derivative, cryptocurrency [6] In recent years, the rapid development of digital currency has aroused broad attention from scholars. The digital currency research originated from the creating an anonymous and untraceable electronic cash system[7] Cryptocurrencies have become the centre of attention in recent years when Bitcoin entered the market. In 2008, Satoshi Nakamoto introduced Bitcoin, a peer-to-peer electronic transaction system that replaces paper and plastic money with crypto currencies[8] Unlike the structures of traditional economic systems, which are less straightforward and regionally integrated, information systems and technological advancements allow decentralized organization, operational security, and straightforwardness, including peer-to-peer connectivity and cryptographic algorithms[9] The manner of a transaction has greatly altered

in the current decade owing to the growth in technology. The application of advanced technology like blockchain protocols or distributed-ledgers in the financial technology sector has turned the attention of many financial experts, investment analysts, and technicians towards cryptocurrencies[10]

Cryptocurrency is a fresh phenomenon that is garnering substantial attention. On the one hand it is based on a fundamentally new technology, the potential of which is not fully understood[11] Cryptocurrency is one of the finest creations in the context of financial industry. It is a digital money that was established with the objective of managing and safeguarding its transactions with the user's identity being disguised[12] Bitcoin may be used to finance terrorism. Owing to the decentralization and anonymity aspects of cryptocurrencies, unlawful transactions cannot be controlled. Bitcoin is often associated with illicit acts, including money laundering and the financing of terrorism[13] To date the cryptocurrency industry has witnessed a tremendous expansion, being amongst the fastest growing international financial markets[14] The first cryptocurrency launched in the beginning of 2009. It was supposed to work in analogy to normal (fiat) money. However, it possessed certain remarkable qualities, being totally digital, third-parties independent and anonymous to a certain degree. After a decade, combined with other, comparable projects, it forms a base of a worldwide economic system.[15] The evolution of the globe in the 4.0 age may be observed that fast developing technology has taken the world in new directions in practically every element of human life, including economic activities[16]

Table 1. Some bibliometric analysis has been done by previous researchers on the topic of Cryptocurrency and Blockchain

Author & Year	Number Document Analizer	Source	Findings
[6]	1.048	SCOPUS	With the development of new technologies, certain ideas become significant in the economic field, as is the case with cryptocurrencies, in general, or Bitcoin and Ethereum, in particular. Due to the influence of these instruments, complete bibliometric research that enables us to acquire all information regarding cryptocurrencies must be undertaken. This study will support scientifc production by outlining the development and lines of relevant research that have been pursued and are presently being followed. We have utilized Tableau, R (Bibliometrix R Package), and VOSviewer tools to evaluate the material. These have been integrated to compile and examine unifed metadata from the Web of Science (WoS) and Scopus databases. The bibliometric study indicates 771 articles on the WoS database and 648 articles on Scopus produced between 2010 and early 2019.
[7]	1.850	SCOPUS	This research evaluates existing literature regarding the economic impacts of bitcoin using bibliometric methodologies. 1850 articles are taken from ''Web of Science core database'' from 2013 to 2020. We analyze research hotspots and development patterns by descriptive statistical analysis, keyword co-occurrence and literature co-citation network analysis. We find

			that literature of computer sciences and interdisciplinary fields mainly research the technologies' effects on the economic phenomenon, the technique progress in overcoming the negative economic effects of cryptocurrency, and appeal to establish a new payment system based on the underlying technologies.
[8]	1.342	SCOPUS	Within a decade, cryptocurrencies have garnered substantial interest. After Bitcoin's inception in 2008, numerous cryptocurrencies began to join the financial world. We employ bibliometric analysis to study the cryptocurrency literature in the fields of business and management. We assess and analyze 464 research papers via bibliometric metrics and social network analysis using Biblioshiny in R. Our analysis emphasizes the most prominent authors, organizations, nations, and studies. Using the findings of the social network analysis of the authors and nations, we exhibit the co-authorship and cooperation among writers from diverse countries at the institutional level and explain how they have increased the knowledge in this field. We identify four streams in the current cryptocurrency literature: (i) the determinants of cryptocurrency return, (ii) the efficiency of cryptocurrencies, (iii) tests of portfolio diversification and sheep flock behaviour and (iv) the regulation, governance, and socio-economic impact of cryptocurrencies. Finally, we provide an agenda for future study in the topic.
[9]	1.225	SCOPUS	The purpose of the current paper is to identify influential aspects of published literature and future research questions to set forth future research agenda based on comprehensive literature review using bibliometric and content analysis. The study analyzed 1225 documents from the international Scopus database using bibliometric analysis and content analysis. VOSviewer software is used for bibliometric analysis.
[10]	1.965	SCOPUS	A new age awaits the growth of bitcoin and blockchain technology. This research emphasizes the important and conceptual features of blockchain and cryptocurrency literature via bibliometric analysis. There are 1965 linked papers between 2015 and 2020, covering diverse architectures and technologies, cryptocurrencies, and blockchain applications. We have installed ''bibliometrix 3.0'', the r-package, and VOS viewer to assess major literature features. IEEE Access is the key magazine for bitcoin and blockchain papers. The University of Cagliari, Notreported, and Peking University are significant connections, while the USA, China, and India are essential nations for literary studies. H. Wang is the key author with the fundamental topic of security of blockchain technology. It is a fixed framework for conceptual elements, core, and future research streams and subjects. The study suggests three research streams: the structure of cryptocurrencies and implications of blockchain technologies, privacy, security management of data and information, and creation of optimum information systems. The research further

			segregates themes into highly centralized and motor themes that are also fundamental themes.
[12]	4.467	ResearchGate	Technology has caused a big change in the lives of the people owing to paradigm shift from offline activities to online activities. Cryptocurrency is a digital coin money based on the idea of cryptography encryption and electrical connection to operate. Being a decentralized currency, it also rejects the intrusion of central banks and digital currencies by them. It alters the virtual trade market by offering a free rein trading mechanism that functions without the participation and regulation of a third party. Digital currencies in today's situation become common therefore this research is a bibliometric way to investigate the cryptocurrency that has attracted a lot of interest in present day.

The objective of this study is to address the following questions:

1. How does blockchain affect cryptocurrency?
2. What is the relationship between cryptocurrency and blockchain?
3. What do I need to know about cryptocurrency and blockchain?
4. What are the biggest problems with cryptocurrency?

This article covers an evaluation of some literature about Cryptocurrency and Blockchain based on previous findings. Besides, some sections such as part 1 cover research purposes, in part 2 will discuss about Cyptocurrencies and Blockchains as well as used for anything, in part 3 discusses the stages of methodology of bibliometric study related to the use of databases, on part 4 the results will be displayed using VOSviewer, in section 5 contains ideas of research ideas and conclusions related to research and its limits.

2. METHODS

One of the purposes of making this article is to analyze how articles about Cryptocurrency and Blockchain are classified, then to find out the research trends about cryptocurrencies and Blockchains, to know which research topics have been published more, and to analyse the topics of future research that enable further investigation.

2.1 *Search for specific journals on the topic*

Many researchers and libraries use this method to find patterns of publication in a particular field. The following are some of the topics in the journal that discuss Cryptocurrency and Blockchain: Financial Innovation (FI), International Review of Financial Analysis (IROFA), Technology Analysis & Strategic Management (TAASM), International Journal of Data and Network Science (IJODANS), Computer Science (CS), Empirical Economics (EE).

Table 2. Journal Profile with Specialized Topics About Cryptocurrency and Blockchain

Point of View	FI	IROFA	TAASM	IJODANS	CS	EE
Publisher	Springer Open	Elsevier	Taylor & Francis	Growing Science	IEEE Access	Research Gate
First published	2022	2021	2021	2020	2020	2022
Last published	2022	2021	2021	2022	2020	2023
Scopus Indexed	Yes	Yes	Yes	Yes	Yes	No

Web of Science Indexed	Yes	Yes	Yes	No	No	No
Impact factor by SJR	1,17	1,88	0,77	0,37	0,93	0,66

According to table 2, there are only three journals with the Scopus index which are classified as follows: FI is classified in Q1, IROFA is classified in Q1, TAASM is classified in Q2, IJODANS is classified in Q2, CS is classified in Q1, EE is classified in Q1.

2.2 *Journal metrics information*

IROFA, TAASM, and CS are the three journals selected, and this section provides their profiles and metrics. Table 3 shows some important things to know about these journals. This metric data was obtained from metadata information collected via the Publish or Perish (PoP) application on December 27, 2023.

Table 3. Metrics information of selected journals

Metrics data	IROFA	TAASM	DOI
Publication years	2021-2021	2021-2021	2020-2020
Citation years	2	2	3
Papers	1	1	1
Citations	42	53	59
Cites/year	21,00	26,50	19,67
Cites/paper	42,00	53,00	59,00
Authors/paper	4,00	3,00	5,00
h-index	1	1	1
g-index	1	1	1
hI,norm	1	1	1
hI,annual	0,50	0,50	0,33
hA-index	1	1	1

2.3 *Reference management*

After the article is downloaded from the journal website, the next step is to organize references using the Mendeley application. This is done to ensure the complete metadata of each article, which includes information about the author, keywords, abstract and other information, is organized easily and completely.

2.4 *Bibliometric analysis*

Bibliometric analysis was performed after the article's complete metadata was confirmed. VosViewer, which is based on a database file, is used to analyze the bibliometrics in this article.csv downloaded from the Scopus site with the search keywords Analisys Blockchain and Cryptocurrency
.

3. RESULTS AND DISCUSSION

We downloaded a few journals based on the csv scopus database and used VosViewer software to analyze it to the first goal of this paper, which is how cryptocurrency and blockchain articles are classified. I made maps based on text data, using titles and abstract fields, and using binary calculation methods to find 3833 terms with the number of incidences at least ten times. The result consisted of 101 most relevant words, 60% of which were automatically selected. However, verification should be done manually by removing words such as editorial, sample, abstract, and other irrelevances. As a result, there are a total of 61 words that can be used to make a map.The next step is to use the Mendeley application to set references after the article is downloaded from the

journal site. To ensure that metadata for each complete article is organized easily and comprehensively, complete metadata, which includes information about the author, keywords, abstracts, and other information, should be included in the reference.
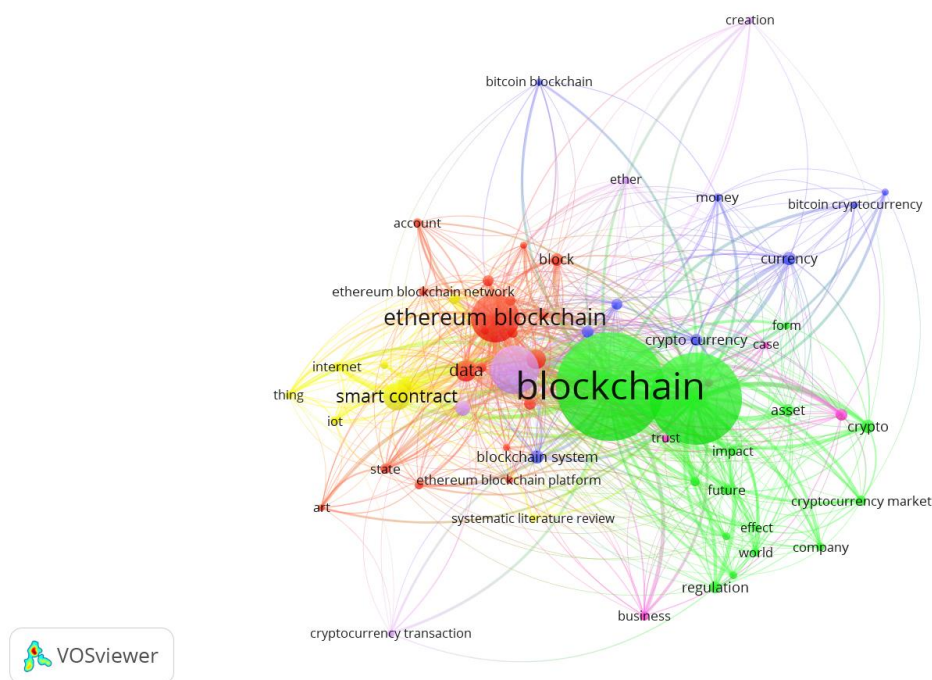

Figure 1. Network Visualization Map of Keywords

Some groups are marked with blue, red, yellow, green, purple, and pink as shown in Figure 1. Some words in the group appear most often based on total articles. The cluster shows so far, six categories of articles have been published. Table 4 gives further explanation.

Table 4. Clusters and keywords therein

Cluster	Total items	Most frequent keywords (occurrences)	Keywords
1	19	Blockchain (5) Ethereum (3) Network (2)	account, art, block, blockchain, consensus, data, ethereum blockchain, ethereum blockchain network, ethereum blockchain platform, network, node, order, private blockchain, proof, scalability, state, time, use case, work
2	15	Cryptocurrency (2)	asset, blockchain, book, company, crypto, cryptocurrency, cryptocurrency market, effect, form, future, impact, implication, project, regulation, world
3	9	Bitcoin (2) Blockchain (3) cryptocurrency (2) currency (2)	attack, bitcoin blockchain, bitcoin cryptocurrency, blockchain system, crypto currency, cryptocurrency blockchain, currency, evolution, money
4	8		healthcare, implementation, internet, iot, smart contract, solution, systematic literature review, thing reliability, reproducibility of results, theoretical model, uncertainty analysis
5	5		Blockchain platform, creation, creation, cryptocurrency transaction, ether, Ethereum
6	5		Business, case, market, role, trust

In order to determine the current trends in multimedia research about face recognition, we can examine the replies obtained directly from the cluster. A visualization of article density is shown in Figure 2. The term "facial expression recognition" is most commonly used in Cluster 1.
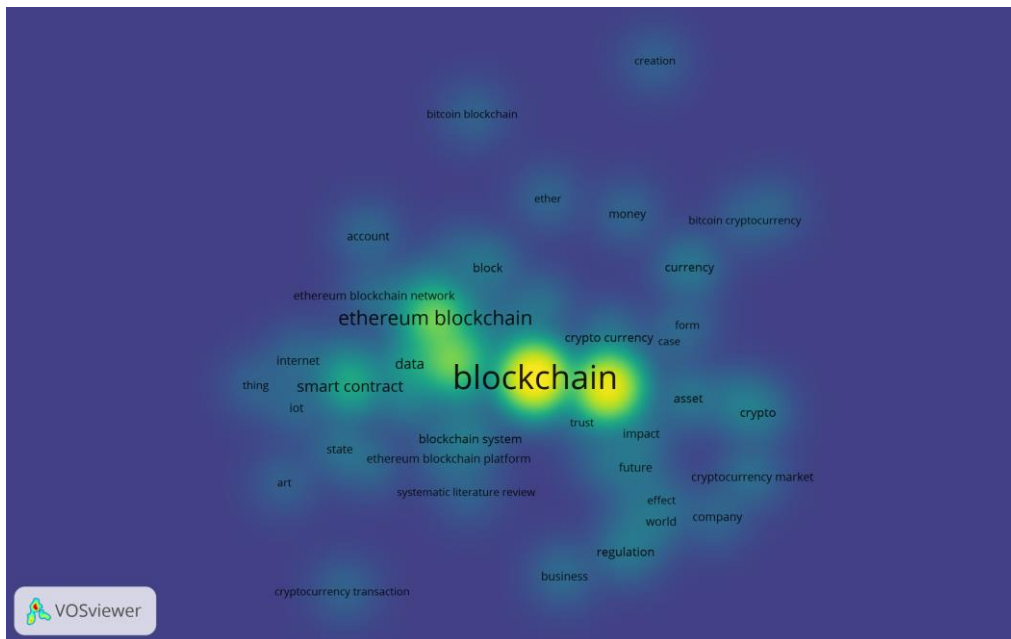

Figure 2. Density visualization map of keywords

There is a cluster of these mapping results that occurs at least in the term, namely cluster 1. This cluster includes issues regarding cryptocurrencies and blockchain. Also, in each cluster, certain terms seldom occur in keywords, assets, risks, transactions, and others. This implies, there is still a research gap that is extremely likely to become a trend in the future, which, of course, is fitted to the world's current and future situations. From the researchers' perspective, there are six clusters, as illustrated in Figure 3.
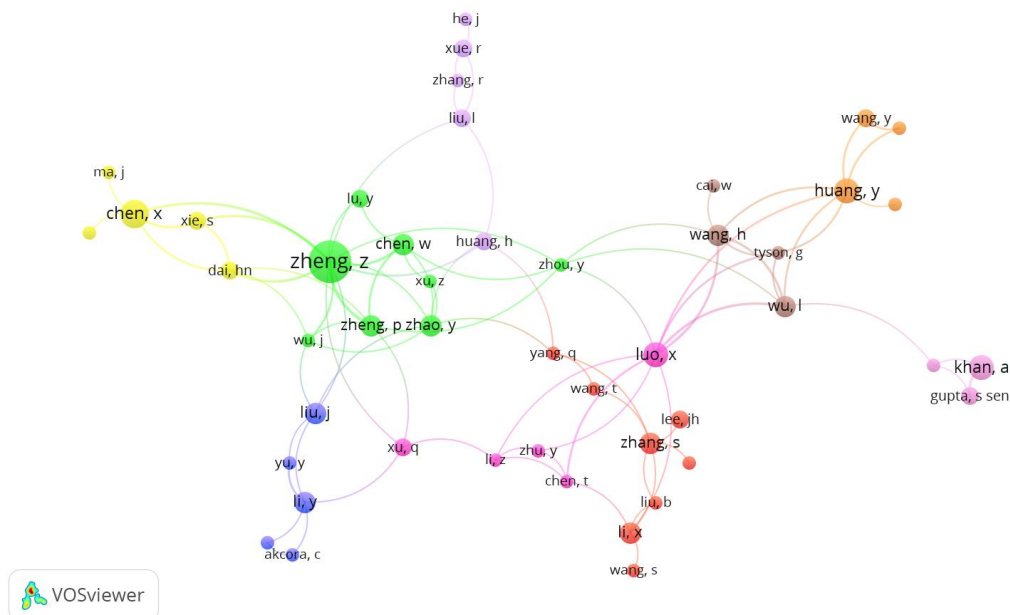

Figure 3. Network Visualization Map of Authors

Based on figure 3, it can be observed that there are multiple major names of each cluster that are indicated with huge dots in every cluster. Only the writers connected in their articles are represented in the picture. Zibin Zheng a professor from China becomes a writer with the most crucial point.

CONCLUSION

The research looked at a variety of publications that covered Cryptocurrency and Blockchain. In this study, we found that journals such as Financial Innovation (FI), International Review of Financial Analysis (IROFA), Technology Analysis & Strategic Management (TAASM), International Journal of Data and Network Science (IJODANS), Computer Science (CS), Empirical Economics (EE) in the context of this research, we concluded that some of the above journal has a more significant influence on the field of Cryptocurrency and Blockchain because the topic of the article can be used in the implementation of research in the fields of cryptocurrency and blockchain.

This research has at least two shortcomings. First, this study depends mostly on publications that are indexed in scopus, however there are also other high-quality magazines, such as Thomson Reuters. Although this research includes formal techniques such as PoP software, VOSviewer, and Mendeley, the author's subjective opinion exists and may detect flaws. Although not indexed by Scopus, future research should employ complicated sample sizes and incorporate multiple different sources.

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