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GLOBAL ANALYSIS OF DIGITAL CURRENCIES: BIBLIOMETRIC AND SOCIAL NETWORK ANALYSIS

DİJİTAL PARALARIN KÜRESEL ÇÖZÜMLEMESİ: BİBLİYOMETRİK VE SOSYAL AĞ ANALİZİ

Hümeyra YILDIZ[1]

ABSTRACT: This study examines the global evolution and research trends of the academic literature on digital currencies. Using bibliometric and social network analysis methods, the study analyzes 7,930 articles published between 2009 and 2025 and indexed in the Web of Science database. Publications related to digital currencies, cryptocurrencies, and central bank digital currencies are evaluated in terms of their distribution across research fields, publication years, and the most influential authors, institutions, and countries. Social network analysis is conducted using the VOSviewer software to visualize collaboration patterns and thematic structures within the literature. The findings reveal a steady increase in digital currency related publications and citations since 2009, peaking in 2023, followed by a declining trend after 2024. The literature is predominantly concentrated in the fields of business finance, economics, and computer science, with the United States, China, and the United Kingdom emerging as the leading contributors. Furthermore, the results suggest that future research is likely to focus increasingly on blockchain technologies, digital asset regulation, and sustainability-related issues. In conclusion, this study provides a comprehensive and systematic overview of the thematic and methodological evolution of digital currency research, offering valuable insights for scholars and policymakers seeking to understand the current state and future directions of the field.

Keywords: Digital Currency, Cryptocurrency, Central Bank Digital Currency (CBDC), Bibliometric Analysis

ÖZ: Bu çalışma, dijital para birimleri çatısında yapılan bilimsel yayınların küresel düzeydeki gelişimini ve araştırma eğilimini analiz etmeyi amaçlamaktadır. Çalışmada, Web of Science veri tabanında 2009-2025 yılları arasında yer alan 7.930 makale, bibliyometrik ve sosyal ağ analizi yöntemleriyle incelenmiştir. Çalışmada, dijital para, kripto para ve merkez bankası dijital para konularına ilişkin yayınların bilimsel alanlarına, yıllarına, en çok katkı sağlayan yazar, kurum ve ülkelerine göre dağılımları incelenmiştir. Elde edilen veriler, VOSviewer programı ile sosyal ağ analizi kullanılarak haritalandırılmıştır. Çalışmanın sonucunda, dijital paralara ilişkin yapılan yayın ve atıf sayılarının 2009'dan itibaren düzenli olarak arttığı, 2023 yılında en yüksek seviyeye yükseldiği ve 2024 sonrası düşüş eğiliminde olduğu tespit edilmiştir. Literatürdeki çalışmaların en çok işletme finansı, ekonomi ve bilgisayar bilimi alanlarında yoğunlaştığı; alana en fazla katkı sağlayan ülkelerin ABD, Çin ve İngiltere olduğu saptanmıştır. Gelecekteki araştırmaların, blockchain teknolojileri, dijital varlıkların regülasyonu ve sürdürülebilirliği gibi alanlara yoğunlaşacağı öngörülmektedir. Bu araştırma, dijital paralar literatüründe tematik ve metodolojik eğilimleri, mevcut ve gelecek durum açısından görünür kılmaktadır.

Anahtar Kelimeler : ***Dijital Para, Kripto Para, Merkez Bankası Dijital Para (MBDP), Bibliyometrik Analiz***

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GENİŞLETİLMİŞ ÖZET

Çalışmanın Amacı

Bu çalışmanın amacı dijital paraların küresel ölçekteki gelişimini, kripto varlıklar, merkeziyetsiz finans, blokzincir ve merkez bankası dijital paralar (MBDP) ekseninde çözümlemek, mevcut durum ve gelecekteki olası durumları ele alarak bu alandaki temel eğilimleri tespit etmektir. Bununla birlikte, dijital para araştırmalarının çeşitli yönlerini kategorize ederek sosyal ağ analizi ile incelemektir. Bu kapsamda, araştırma ağları haritalandırılarak dijital para ekosisteminin boyutları somutlaştırılmak üzere literatürde öne çıkan temalar ve boşluklar tespit edilmeye çalışılmıştır.

Araştırma Soruları

Çalışmada, araştırma soruları Altunay (2021, ss. 1276-1277), Erişlik (2024, s. 2), Kvedaravičiūtė ve Šapkauskienė (2025) çalışmalarından yararlanılarak oluşturulmuştur. Çalışma ekseninde; dijital para, kripto para ve MBDP'ye ilişkin yapılan çalışmaların bibliyometrik analizi gerçekleştirilerek şu sorular cevaplanmaya çalışılmıştır: 1-Literatürde hangi anahtar kavramlar ve araştırma eğilimleri öne çıkmaktadır? 2-Dijital para, kripto para ve MBDP'ye ilişkin yapılan çalışmaların coğrafi ve tematik dağılımı nasıldır? 3-Alana en çok katkı sağlayan yazarlar, kurumlar ve ülkeler hangileridir? 4-Literatürde konuya ilişkin multidisipliner çalışmaların etkisi ve önemi nedir? 5-Gelecek araştırmalar için hangi kavramsal ve metodolojik yaklaşımlar önerilmektedir?

Literatür Araştırması

Dijital paralar, kripto para birimi ve MBDP üzerine yapılan çalışmaların bibliyometrik analizi, belirgin tematik kümelenmeler ve ortaya çıkan disiplinlerarası zorluklarla birlikte çeşitlenen bir araştırma alanı ortaya koymaktadır. Konuya ilişkin mevcut literatürde, risk yönetimi, blokzincir teknolojisi, merkeziyetsiz finans (DeFi), piyasa ve fiyatlandırma verimliliği, portföy çeşitlendirmesi, dijital para ticaret faaliyetleri, MBDP, volatilite ve sürdürülebilirlik çalışmaları yer almaktadır (Almeida vd., 2025; Alsmadi vd., 2022; Atree & Tripathy, 2025; Aydoğdu, 2025; Çetin vd., 2025; Çifçi, 2025; Kuzior & Sira, 2022; Kuzudişli & Çarıkçı, 2021). Geniş araştırma hacmine rağmen, düzenleyici ve teknik konular genellikle ayrı ayrı ele alınmıştır. Literatürde, özellikle makro finansal riskler, düzenleyici uyum, DeFi ve MBDP'ler arasındaki birlikte çalışabilirlik, ülkeler arası benimseme dinamikleri ve reel sektördeki etkileri gibi konularda önemli boşluklar bulunmaktadır ve bu konular yeterince araştırılmamıştır. Hukuk, ekonomi, teknoloji ve davranışsal finans açısından multidisipliner araştırmaların daha fazla ele alınması ve politika odaklı analiz sağlayan çalışmaların geliştirilmesi açısından bu çalışmanın, literatürü sistematik olarak haritalandırarak dijital paraların küresel çözümlemesinde katkı sağlayacağı düşünülmektedir. Ayrıca, çalışmanın dijital paraların gelişim, olgunluk ve araştırma ihtiyaçları hakkında politika yapıcılara, uygulayıcılara ve akademisyenlere yol haritası sunması beklenmektedir.

Yöntem

Bu çalışmada, dijital para birimlerin küresel gelişimini incelemek için sosyal ağ analizi ile birlikte bibliyometrik bir yaklaşım kullanılmıştır. Bibliyometrik analiz, konuya ilişkin literatürün nicel bir şeklide incelenip bilim haritasının çıkarılmasını sağlamaktadır (Aria & Cuccurullo, 2017). Dijital para birimlerinin araştırma eğilimlerini, önemli makale ve etkili yazarları, anahtar temaları ve coğrafik dağılımı ortaya çıkarmak amacıyla bibliyometrik yaklaşımın benimsenmesi önem arz etmektedir. Mevcut çalışmada Web of Science veri tabanı seçilmiştir. Web of Science, bibliyometrik analizler dahil çeşitli analizler için güvenilir ve ileri düzey veri analizleri için gelişmiş arama göstergelerine sahiptir. Çalışma için veriler Web of Science veri tabanında 2009-2025 yılları arasında yayınlanan 7.930 makalelerden oluşmaktadır. Anahtar kelime olarak "dijital para", "kripto para", "merkez bankası dijital para birimi" terimleri kullanılmıştır. Dijital para birimleri finans, ekonomi, bilgisayar bilişim sistemleri ve diğer mühendislik bilimleri gibi çeşitli alanlarda yer alması sebebi ile herhangi bir coğrafi veya disipliner kısıtlama uygulanmamıştır. Bibliyografik veriler VOSviewer programında analiz edilerek haritalandırılmıştır. Dijital para birimleri üzerine yapılan çalışmaların küresel çözümlemesini saptamak amacıyla; yıllık yayın sayısı alınarak yayın eğilimleri, en çok atıf alan makale ve yazarları belirlemek için atıf analizi, yazar, kurum ve ülkeler arasındaki ilişkiyi tespit etmek için ortak yazarlık analizi, literatürdeki temaları sınıflandırarak temel araştırma alanlarını ortaya çıkarmak için anahtar kelime analizi ve gelecek projeksiyonu belirlemek için sosyal ağ analizi yapılmıştır. Ayrıca yayın, anahtar kelime ve kümeler arasındaki ilişkileri görselleştirmek için çeşitli harita ve ağ diyagramı oluşturulmuştur.

Sonuç ve Değerlendirme

Çalışmada, Web of Science veri tabanında yer alan 7.930 makale, dijital para, kripto para ve MBDP konuları çeşitli yönleriyle ele alınmıştır. Elde edilen bulgulara göre, 2009'dan itibaren kripto paralar, dijital paralar ve MBDP üzerine yapılan çalışmaların üstel bir hızla arttığını ve 2023 döneminde hem yayın hem atıf sayılarının en üst seviyede olduğu ve 2024 tarihten itibaren bu oranların azalmaya başlandığı tespit edilmiştir. Buna göre, son

on yedi yılda 2023'teki artışın eşik yılı olarak literatürdeki doygunluğa ulaşma ve bu tarihten itibaren çalışma ve atıf sayılarının azalmasının araştırmaların yön değiştirmeye başladığı veya akademik ilginin azalmaya başladığı sonucuna ulaşılmıştır. Dijital para birimlerine ilişkin yapılan çalışmaların alansal dağılımı incelendiğinde, en fazla işletme ve ekonomi ve bilgisayar bilimleri alanlarında yoğunlaştığı tespit edilmiştir. Bu bulgu, dijital paraların finansal sistemlerle birlikte, teknolojik altyapıları derinlemesine etkileyen bir olgu olduğunu göstermektedir. Mühendislik ve diğer disiplinlerin de bu alanı takip etmesi, dijital paraların çok disiplinli bir araştırma konusu haline geldiğini vurgulamaktadır. Bunun yanı sıra, alana en fazla katkı sağlayan ülkeler incelendiğinde sırasıyla ABD, Çin ve İngiltere olarak küresel ölçekte ilk üçte yer aldığı saptanmıştır. Ayrıca, Hindistan, Japonya, Güney Kore gibi ülkelerin de bu alanda aktif araştırmalar yürüterek ön sıralarda yer alması dijital paraların sadece Batı dünyasında değil, Asya'da da önemli bir etki alanı olduğunu göstermektedir. Son olarak, tematik sosyal ağ analizinden elde edilen bulgulara göre, dijital para çatısındaki araştırmaların gelecekte merkeziyetsiz finans (DeFi), blockchain teknolojileri ve dijital varlıkların sürdürülebilirliği üzerine yoğunlaşacağı sonucuna ulaşılmıştır.

1. INTRODUCTION

Digital currencies have ushered in a new era, bringing fundamental changes to the world of finance. The first digital currency experiments began in the 1980s with electronic payment systems, and the field continued to develop as digital banking transactions emerged (Chaum, 1983). In 2009, with the launch of Bitcoin, a new ecosystem emerged in the global economy, driven by the development of digital assets and decentralized finance (DeFi) systems. Following Bitcoin, which is a different school of digital money, various cryptocurrencies have been derived and countless digital currencies are used in the market today.

Digital currencies increase the accessibility of financial systems by improving their speed and efficiency. They offer various advantages such as reducing costs in cross-border payments, expanding financial access and reducing the intervention of central authorities. In addition to the benefits that each newly developed technology brings, it also has particular specific challenges and limitations. Regulatory uncertainty, cybersecurity risks and the adequacy of digital infrastructures are the prominent examples of these limitations (Kvedaravičiūtė & Šapkauskienė, 2025, s. 3). Digital currencies have regional and national differences and each country's approach to this area varies. Adoption of cryptocurrencies and central bank digital currencies (CBDCs), regulatory arrangements, levels of social acceptance, and national and global economic conditions are important factors affecting the use of digital currencies. On a worldwide scale, some countries support the use of digital currencies, while others prohibit them. Other countries are cautiously following the developments on the subject.

This study aims to analyze the development of digital currencies on a global scale, to identify the main trends in this field by addressing the current situation and possible future situations, and to conduct social network analysis to categorize and examine various aspects of digital currency research. Examining the digital currency theme through bibliometric analysis and social network analysis has the projection of identifying new research trajectories in the literature on cryptocurrencies and central bank digital currencies. Mapping the existing research on digital currencies and analyzing it on a global scale, emphasizing the connections between different research clusters is essential for inclusiveness.

In this study, we examined studies on cryptocurrencies and central bank digital currencies in the Web of Science database between 2009 and 2025. Through bibliometric and social network analysis of the analyzed studies, the studies on the subject, the number of publications by years, the distribution of publications by types and years, the contribution status by countries, the relationships of the keywords used, the relationship between the authors, the citation links to the studies and the most cited publications were analyzed. In addition, the geographical distribution of publications was categorized and analyzed globally. In addition, the results were visualized using the WOSwiever program. The fact that the study is based on the Web of Science database increases the importance of the study because of the indices that make up the Web of Science, the fact that it has crucial essential citation areas in the academic

literature and its productivity in terms of international inclusiveness. In the first part of the study, the development process, current situation, future projections and global approaches of digital currencies are analyzed. Subsequently, studies on digital currencies in the relevant field are discussed. In the second part, the findings regarding the analysis and network visuals are explained. In the last part, the findings are discussed and recommendations are developed.

2. LITERATURE REVIEW

This section presents a literature review of national and international studies that used bibliometric analysis of digital currencies. The literature indicates that studies are predominantly focused on topics such as cryptocurrencies, Bitcoin, blockchain, and central bank digital currencies (CBDCs). The current literature covers risk management of digital currencies, blockchain technology, decentralized finance (DeFi), market and pricing efficiency, portfolio diversification, digital currency trading activities, sustainability, and volatility (Almeida vd., 2025; Alsmadi vd., 2022; Atree & Tripathy, 2025; Aydoğdu, 2025; Çetin vd., 2025; Çifçi, 2025; Kuzior & Sira, 2022; Kuzudişli & Çarıkçı, 2021). Despite the extensive research volume in this field, regulatory and technical issues have generally been addressed separately. There are significant gaps in the literature, particularly regarding macrofinancial risks, regulatory compliance, interoperability between DeFi and CBDCs, cross-border adoption dynamics, and real-sector impacts, and these topics have not been sufficiently researched. This study is expected to contribute to the global analysis of digital currencies by systematically mapping the literature, thereby facilitating further multidisciplinary research from legal, economic, technological, and behavioral finance perspectives and the development of policy-oriented analyses. Furthermore, the study is expected to provide policymakers, practitioners, and academics with a roadmap regarding the development, maturity, and research needs of digital currencies.

Merediz-Solà & Bariviera, (2019) revealed in their study that cryptocurrencies are mainly a combination of computers and economics by using the keyword Bitcoin and that studies are primarily conducted in these fields. By examining 1162 Bitcoin-themed articles indexed in Web of Science between 2012 and 2019, it was determined that the themes of cryptocurrency, fintech, and peer-to-peer lending will be addressed more in the future.

Nasir et al. (2021) drew inferences about the future using the keywords blockchain and cryptocurrency in a bibliometric analysis of 1965 articles published between 2015-2020. It was found that the themes of fintech, Islamic finance, valuations, and the dynamics of cryptocurrencies explored. In addition, it was concluded that business ledger technology related to the infrastructure of blockchain and cryptocurrency protocols is the central theme and the development of privacy and data security management information systems.

Çizmecioğlu & Akman (2021), in their study, identified the future trends in social sciences research through a bibliometric analysis of publications in the Web of Science database covering 2015-

2020 on blockchain and cryptocurrency. The results showed that studies over this five-year period increased 120 times, and citations grew 2600 times.

Kuzudişli & Çarıkçı (2021), analyzed how cryptocurrencies are perceived by educators working in the fields of accounting and finance. Within the context of the digital payment convenience and transactional advantages offered by cryptocurrencies, the study analyzes educators' levels of awareness and attitudes toward these assets. The findings indicate that educators exhibit a high degree of awareness and interest in cryptocurrencies, while also emphasizing the rapid development and growing prominence of cryptocurrencies in the financial landscape.

Alsmadi et al. (2022) identified future research areas in the literature by using bibliometric and content analysis of 1225 documents on cryptocurrencies in the Scopus database. In the study, it was determined that the most cited country was the United Kingdom and the country with the highest number of publication links was Tianjin University in China. In addition, the keyword analysis of the cryptocurrency literature was found to have two classes representing the latest trends in Blockchain, Fintech, and cryptocurrency, and predictions were made for future research in these trends.

Alqudah et al. (2023) investigated the sustainability of investing in cryptocurrencies and analyzed 1442 articles using the Web of Science database between 2014 and 2021 and evaluated ESG factors in a small percentage. The study identified future research trends that may be useful in demonstrating environmental impact, examining financial behavior, determining the long-term sustainability of cryptocurrencies, and assessing their financial success.

Erişlik (2024) analyzed the relationship between authors, publications, and keywords through a bibliometric study of 6175 publications using the keyword cryptocurrency in the Web of Science database. It was found that the first publication on cryptocurrency appeared in 2014, with 42% of the studies conducted in computer science and 11% in finance. Additionally, keywords such as blockchain, Bitcoin, Ethereum, and volatility were frequently used alongside cryptocurrency, and it was observed that the keywords were grouped into 255 clusters.

Wang & Hausken (2024), using a dataset of 3,873 publications between 2012 and 2022, found that there was a significant increase in research on Bitcoin and that the cryptocurrency coincided with the bull market. They identified four key areas of monetary policy for future Bitcoin research, along with decentralized finance (DeFi), non-fungible token (NFT), clean energy and mining.

Kvedaravičiūtė & Šapkauskienė (2025) analyzed articles in the Web of Science and Scopus databases using VOSviewer from 2018 to 2023. Their keyword analysis of the authors revealed three main focuses on central bank digital currencies in the economy: cash, monetary policy, and financial stability. Through map-based text analysis, the study identified three key themes for future research: (1) policy-related studies on financial systems, (2) an in-depth examination of the design and features of

central bank digital currencies, and (3) research on central bank digital currencies' impact on the banking system.

Atree & Tripathy (2025), analyzed the relationship between cryptocurrencies and financial assets by applying bibliometric and content analysis methods. The research mapped 1013 research articles from Scopus and discussed new themes: cryptocurrency behaviour in crisis period, short-term cryptocurrency-long-term financial asset relationships, state of the art technologies in cryptocurrency financing, and investor behaviour in cryptocurrency investments.

Aydoğdu (2025), examined the return and volatility connectedness among NFTs, crypto assets, and traditional financial assets, with a particular focus on the implications of digital assets for portfolio diversification strategies. The findings indicate that digital assets exhibit stronger dynamic interdependencies with other asset classes, especially during periods of heightened market stress such as the COVID-19 pandemic and the 2021 cryptocurrency bubble. Moreover, the portfolio analysis suggests that the inclusion of NFTs and cryptocurrencies in portfolios comprising gold, oil, and equities may enhance diversification benefits.

Almeida et al. (2025) investigated how market efficiency in cryptocurrency pricing varies between centralized and decentralized trading platforms across different currency denominations. The study documents that market efficiency improves over time in both market structures, while decentralized platforms exhibit relatively superior performance for specific trading pairs. Moreover, the authors emphasize that heterogeneity in trading architectures and pricing mechanisms plays a pivotal role in explaining price formation dynamics within cryptocurrency markets.

Çetin et al. (2025) examined the impact of incorporating cryptocurrencies into traditional commodity portfolios on risk and performance. Using data covering the period from 2017 to 2022, the study analyzes volatility and volatility spillovers and finds that cryptocurrencies exhibit low correlations with agricultural commodities, soft commodities, and metals. The results demonstrate that the inclusion of cryptocurrencies contributes to risk reduction through portfolio diversification, while also enhancing portfolio performance and providing hedging benefits.

A review of the literature indicates that the findings of this study largely align with those reported by Alsmadi et al. (2022), Erişlik (2024), Wang and Hausken (2024), Kvedaravičiūtė and Šapkauskienė (2025), and Atree and Tripathy (2025), as it similarly captures the thematic and methodological development of research on digital assets. On the other hand, this study goes beyond existing work by documenting a declining trend in digital asset–related research since 2024 and by highlighting the need for further studies on the regulatory frameworks governing cryptocurrencies and CBDCs. In doing so, the study makes a substantial contribution to the literature by providing a comprehensive assessment of both current patterns and future research directions in the digital asset domain.

3. RESEARCH METHODOLOGY

This study uses a bibliometric approach combined with social network analysis to examine the global development of digital currencies. Bibliometric analysis provides a quantitative review of the literature on the topic and provides a scientific map (Aria & Cuccurullo, 2017, s. 961). It is important to adopt a bibliometric approach to reveal the research trends, important articles and influential authors, key themes and geographical distribution of digital currencies. In the current study, the Web of Science database was selected. Web of Science is reliable for various analyses including bibliometric analyses and has advanced search indicators for advanced data analysis. In addition, Web of Science has a large collection of data from different disciplines and various types of publications. The data for the study consists of 7,930 articles published in the Web of Science database between 2009 and 2025. The terms "digital currency", "cryptocurrency", "central bank digital currency" were used as keywords. No geographical or disciplinary restrictions were applied as digital currencies are found in various fields such as finance, economics, computer information systems and other engineering sciences.

Bibliographic data was transferred to the VOSviewer program, analyzed, and mapped. To identify trends in studies on digital currencies, the number of annual publications was used to analyze publication patterns. Citation analysis was conducted to determine the most cited articles and authors. Co-authorship analysis was performed to explore relationships among authors, institutions, and countries. Keyword analysis was used to classify themes within the literature and highlight key research areas. Social network analysis was conducted to project future developments. Additionally, various maps and network diagrams were created to visualize relationships between publications, keywords, and clusters. While bibliometric and social network analyses offer a comprehensive overview of the field, the study has limitations, including reliance solely on data from the Web of Science database and focusing only on articles by study type. However, as new articles are published, the study's results may become less relevant. Table 1 below summarizes the study.

Table 1. Summary Table of the Study

Headlines	**Results**
Number of Studies	7,930
Keywords	"digital currency", "cryptocurrency", "central bank digital currency (CBDC)"
Period	2009-2025
Type of Source Utilized	Article
Type of analysis	Bibliometric and Social Network Analysis

Source: Created by the author based on data from the Web of Science database.

4. FINDINGS

This section presents findings on the spatial distribution of studies, including the number of studies and citations over the years, the top 10 countries with the most publications, the top 10 authors

with the most articles, the top 10 most cited articles, the universities with the highest publication counts in the field, and the languages in which the studies are written.

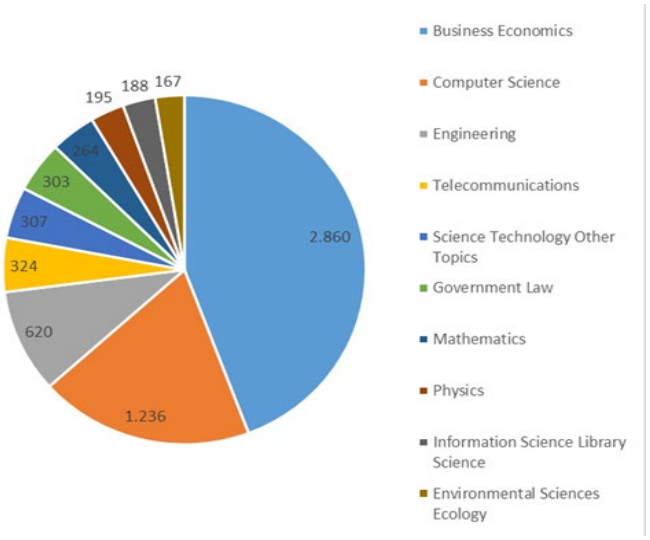
4.1. Spatial Distribution of the Number of Studies

When analyzing the data on digital currencies in the Web of Science database, it is evident that the most studied field among the top 10 is Business & Economics, accounting for 44%. This is followed by Computer Sciences at 19% and Engineering Sciences at 9%. Table 2 below lists the field of study, the number of articles published in each area, and their respective percentages. Graph 1 illustrates the distribution of publications across different fields.

Table 2. Distribution of Publications by Field

Workspace	Number	Percentage %
Business & Economics	2.860	44
Computer Science	1.236	19
Engineering	620	9
Telecommunications	324	5
Science Technology Other Topics	307	4
Government Law	303	4
Mathematics	264	4
Physics	195	3
Information Science Library Science	188	2
Environmental Sciences Ecology	167	2

Graph 1. Distribution of Publications by Field

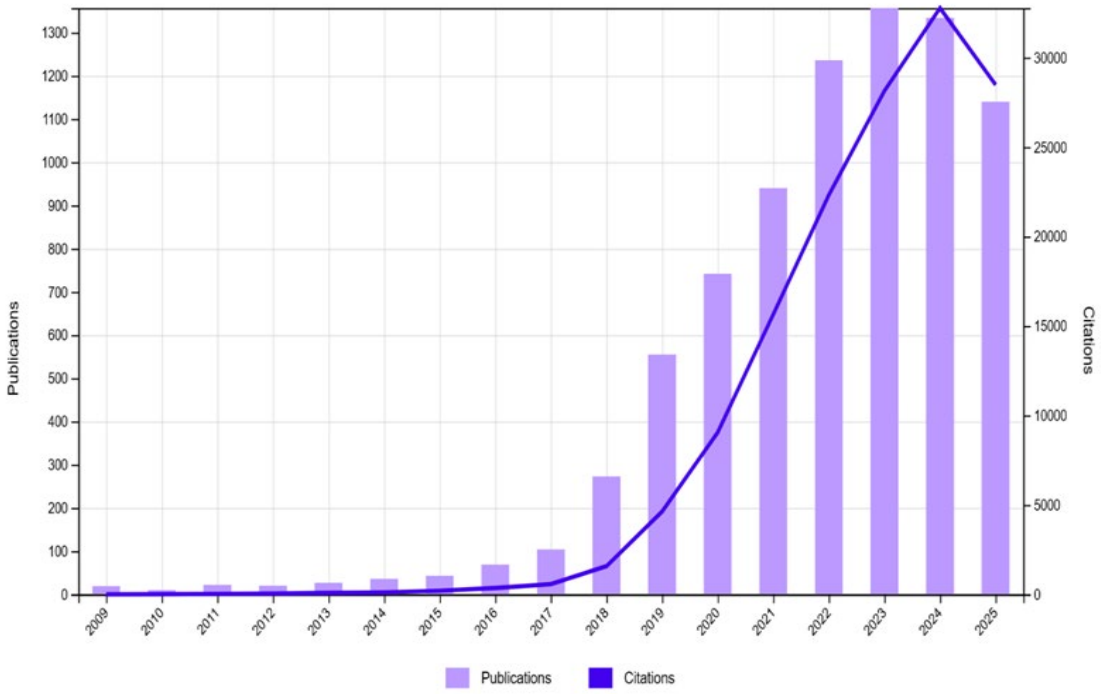


Source: Created by the author based on data from the Web of Science database.

4.2. Number of Studies and Citations by Years

When examining the number of studies and citations by year, 2009 was chosen as the starting point, and studies included in Web of Science up to November 17, 2025, were analyzed. As shown in Figure 2, the number of studies and citations increased linearly from 2009 to 2017, with a rapid rise in the number of studies published between 2017 and 2023. Meanwhile, the number of citations showed a slower increase between 2017 and 2018. It was observed that citations increased rapidly starting in 2018, reaching their peak in 2023. After 2023, a turning point occurred, and a downward trend appeared in subsequent years. While 2023 had the highest figures, with 1,131 publications and 27,271 citations, both declined sharply afterward. The lowest number of citations (3) was in 2009, and the fewest publications (10) appeared in 2010.

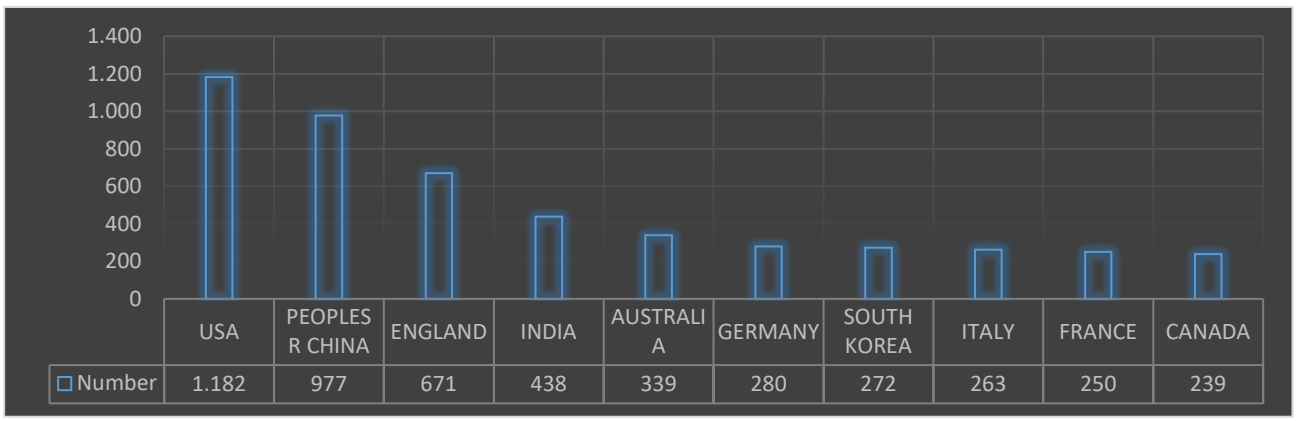
Graph 2. Number of Studies and Citations by Years



4.3. Top 10 Countries with the Most Publications

When analyzing the data, the top 10 countries contributing the most to the field are shown in Chart 3, with the USA ranking first with 1182 publications, followed by China with 977, the UK with 671, and India with 438. In South Korea, Italy, France, and Canada, the number of publications is similar but lower. This illustrates the regional concentration of research and the global influence of leading countries. Scientific output in digital currency is primarily driven by the United States and China. Both countries' prominent roles in global research, policy, and market developments indicate that research output is closely tied to their economies, regulations, social adaptation, and technological infrastructure. Additionally, it can be concluded that the US and China are leaders in investment, innovation, and regulatory progress within the digital currency field.

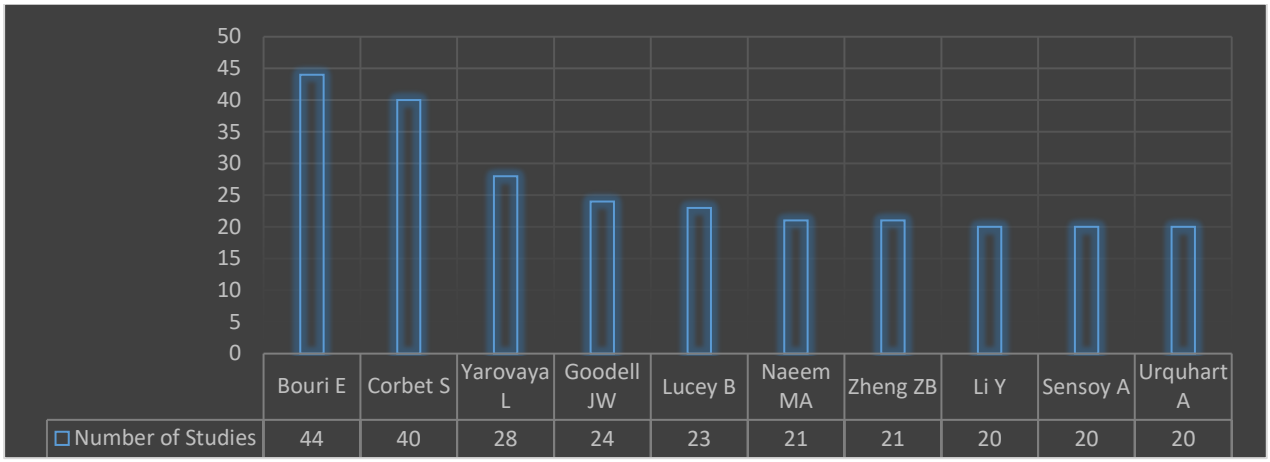
Graph 3. Countries with the Most Publications



4.4. Top 10 Authors with the Most Articles

The top 10 authors with the highest number of publications in the Web of Science database contributing to the literature on digital currency, cryptocurrency and CBDC themes are given in Chart 4. Elie Bouri ranks first with 44 publications, while Xiaoqi Li, Ahmet Şensoy and Andrew Urquhart are in the top 10 with 20 publications.

Graph 4. Authors who wrote the most articles



4.5. Top 10 Most Cited Articles

The total number of citations received by the articles within the scope of the study is 49.325. When the citations made by the authors to themselves are excluded, the total number of citations is 44.835. The most cited field is computer information systems sciences, which ranks first with 7,370 citations and 17% of the total number of citations. The second most cited field is economics with 4,848 citations and a rate of 11%. The h-index of the 6.715 articles analyzed was 133. Table 3 lists the author information, year of publication, journal, number of citations and quartile category of the top 10 most cited articles.

Table 3. Most Cited Articles

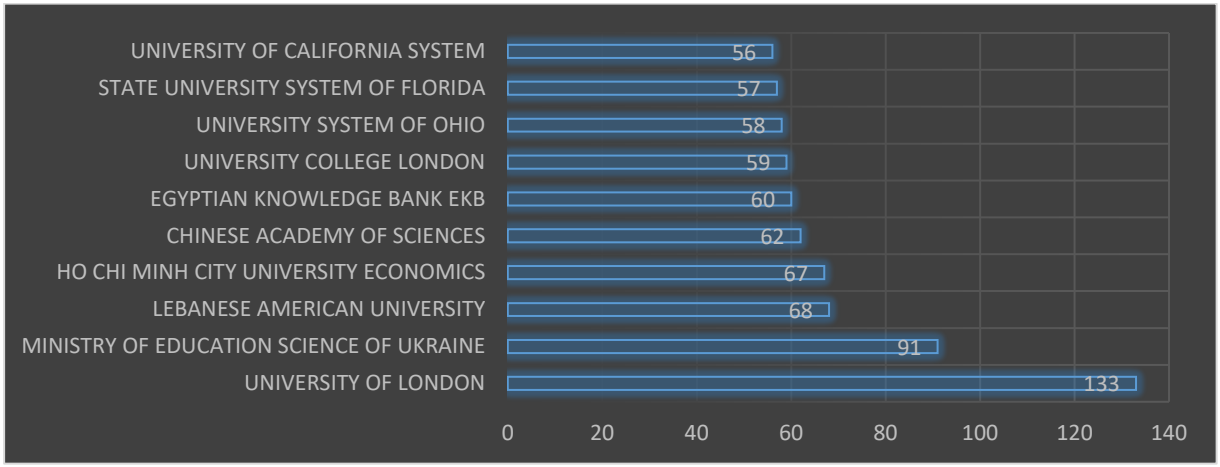
Article Name	Author Name(s)	Year	Journal Name	Number of Citation	Category Quartile
Blockchain Challenges and Opportunities: A Survey	Zheng, Zibin; Xie, Shaoan; Dai, Hong-Ning; Chen, Xiangping; Wang, Huaimin	2018	International Journal of Web and Grid Services	1.672	Q4
Bitcoin and Beyond: A Technical Survey on Decentralized Digital Currencies	Tschorsch, Florian; Scheuermann, Bjoern	2016	Ieee Communication Surveys and Tutorials	865	Q1
The Inefficiency of Bitcoin	Andrew Urquhart	2016	Economics Letters	738	Q2
A Survey on The Security of Blockchain Systems	Li, Xiaoqi; Jiang, Peng; Chen, Ting; Luo, Xiapu; Wen, Qiaoyan	2020	Future Generatıon Computer Systems-The Internatıonal Journal of Escıence	736	Q1
On The Hedge And Safe Haven Properties of Bitcoin: Is It Really More Than A Diversifier?	Bouri, Elie; Molnar, Peter; Azzi, Georges; Roubaud, David; Hagfors, Lars Ivar	2017	Finance Research Letters	727	Q1
Bitcoin: Medium of Exchange or Speculative Assets?	Baur, Dirk G.; Hong, KiHoon; Lee, Adrian D.	2018	Journal of International Financial Markets Institutions & Money	649	Q1
Volatility Estimation For Bitcoin: A Comparison of GARCH Models	Katsiampa, Paraskevi	2017	Economics Letters	573	Q2
The Economics of Bitcoin Price Formation	Ciaian, Pavel; Rajcaniova, Miroslava; Kancs, d'Artis	2016	Applied Economics	532	Q2
Putting Education in Educational Apps: Lessons From The Science of Learning	Hirsh-Pasek, Kathy; Zosh, Jennifer M.; Golinkoff, Roberta Michnick; Gray, James H.; Robb, Michael B.; Kaufman, Jordy	2015	Psychological Science in The Public Interest	499	Q1
Bitcoin Meets Google Trends and Wikipedia: Quantifying The Relationship Between Phenomena of The Internet Era	Kristoufek, Ladislav	2013	Scientific Reports	484	Q1

4.6. Universities with the Highest Number of Publications in the Field

When the universities that contributed the most to the literature were examined, it was determined that London University was in the first place with 133 publications with a significant

difference trend. Then, Ministry of Education Science of Ukraine with 91 publications. Other institutions continue to contribute to the literature with an average of 60 12 publications. Chart 5 below shows the top 10 universities with the highest number of publications.

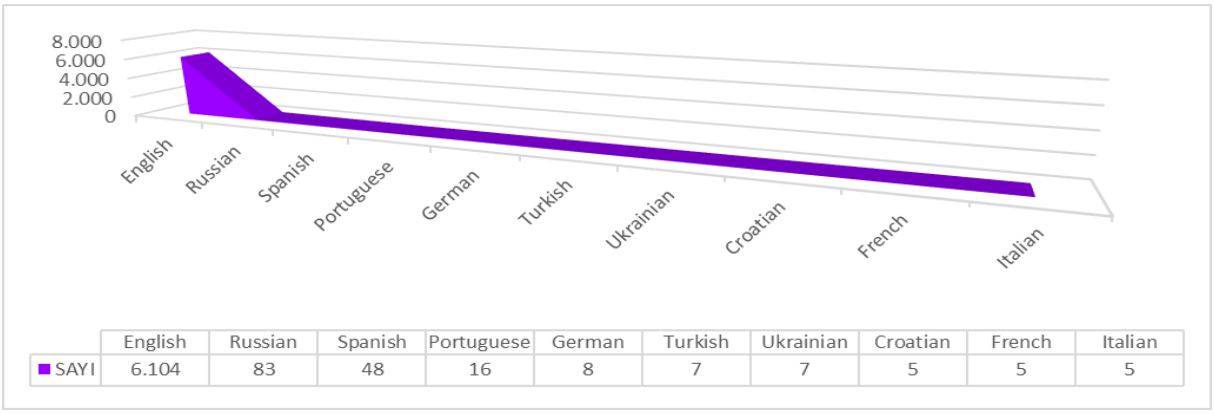
Graph 5. Top 10 Universities with the Highest Number of Publications



4.7. Findings Related to the Writing Language of the Studies

The top 10 writing languages in the literature were analyzed and it was determined that 97% of the literature was written in English with 6,104 publications. Russian with 83 publications, Spanish with 48 publications, Portuguese with 16 publications. German, Turkish, Ukrainian, French and Italian with an average of 6 publications. The data on the language of writing of the studies published in the Web of Science database are shown in Graph 6 below.

Graph 6. Spelling Languages Related to the Number of Studies



	English	Russian	Spanish	Portuguese	German	Turkish	Ukrainian	Croatian	French	Italian
SAYI	6.104	83	48	16	8	7	7	5	5	5

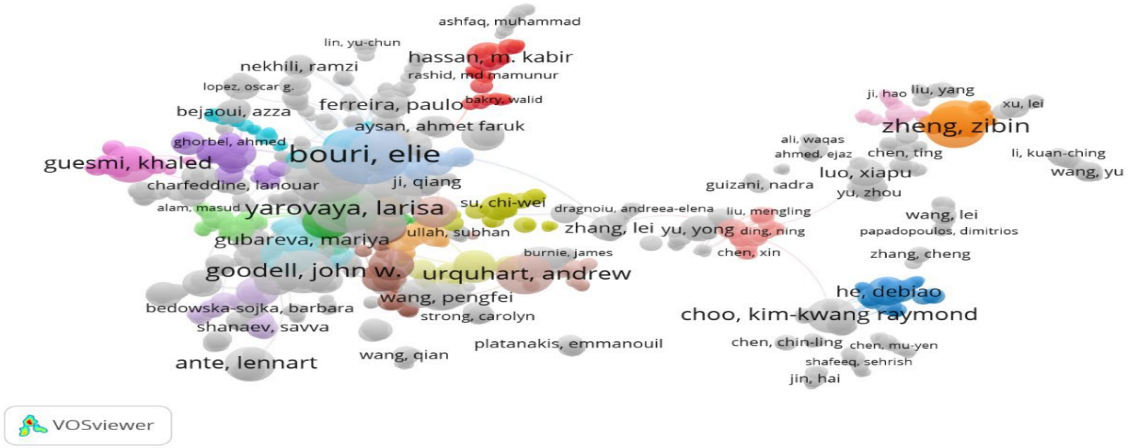
5. ANALYSES AND NETWORK VISUALIZATIONS

Under this heading, co-author analysis, country citation analysis, author citation analysis, author citation analysis, keyword analysis and bibliographic text match analysis are respectively performed with the Vosviewer program. All evaluations made in line with these analyses were mapped with social network analysis.

5.1. Co-authorship of Authors

Co-authorship analysis is a type of analysis that shows the network connections of authors who perform a joint work and highlights authors according to their connections. According to the co-authorship analysis, a social network map was created by determining at least "1" publication value and at least "3" citation values for an author's document to identify the most connected and collaborating authors. 6,125 out of 8,886 authors meet these values. According to the co-author social network map in Figure 1, the most highly connected authors are Elie Bouri, Andrew Urquhart, John W. Goodell, Larisa Yarovaya, Zibin Zheng.

Figure 1. Co-Author Social Network Map

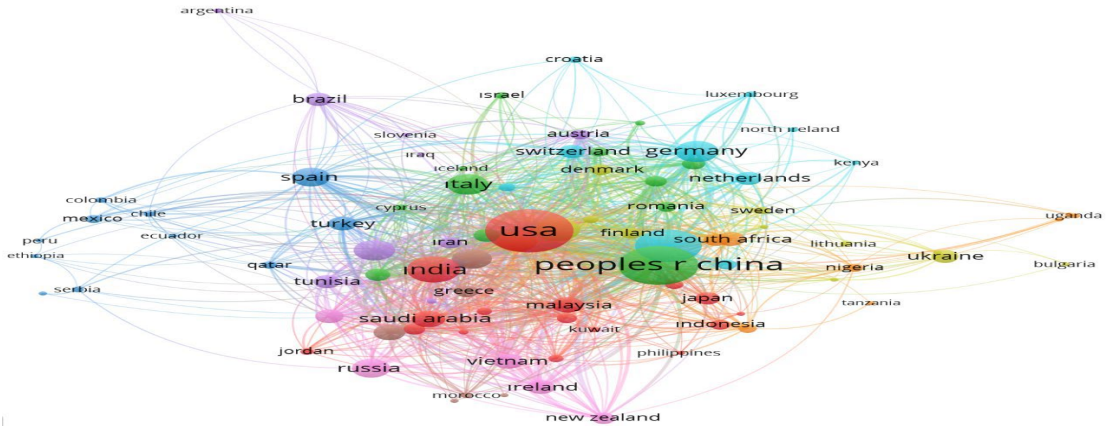


5.2. Citation of Countries Analysis

In Figure 2, the country social network map of the authors working in the field of digital currencies is shown below, and the data were analyzed by selecting the minimum number of publications of a country as "1" and the minimum number of citations of a country as "1". Out of 125 countries, a visual was created by connecting 115 countries. In the citation social network map of the countries, the USA, China and India are in the first three places.

In the social network map of countries, the central position of the United States, China, and India indicates that these countries are decisive in the literature in terms of both the number of publications and citation relationships. When evaluated together with the color-based clustering structure, it is seen that academic interaction between countries in the digital currency literature exhibits a central but multi-focused structure.

Figure 2. Citation Social Network Map of Countries

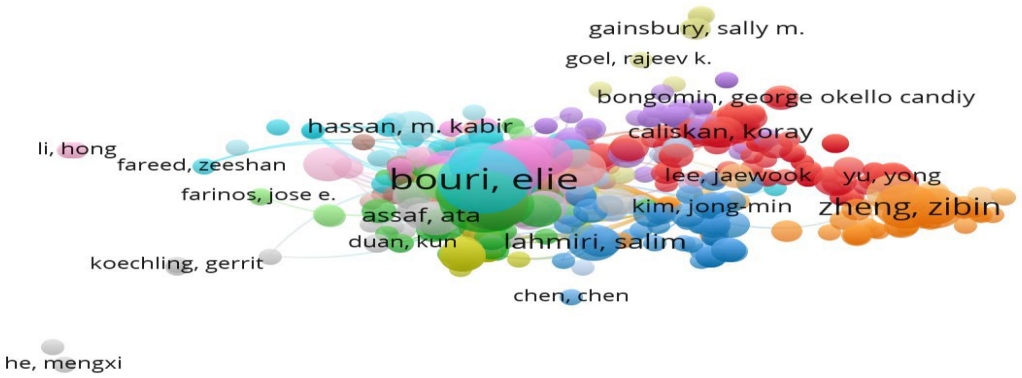


5.3. Citation of authors

Author citation analysis was performed by examining the relationship between authors' publications and citations, and an author citation social network map was created in Figure 3. To identify citation networks, at least "3" publications and "3" citation values were required. A network map with 666 connections was generated from 689 interconnected units. The most cited author was Elie Bouri, with 3,437 citations across 44 publications.

In the social network structure, node sizes reflect authors' publication output and citation impact, while the links between nodes represent academic interactions and co-citation relationships. Authors positioned at the center of the network and depicted by larger nodes emerge as core actors with substantial influence in the literature. In contrast, clusters distinguished by different colors denote sub-research communities organized around shared research themes. The multidirectional connections among these clusters indicate a high level of information flow and interaction across different research groups within the digital currency field. Overall, this structure demonstrates that the literature is simultaneously centralized around influential authors and characterized by an integrated academic network fostered by interdisciplinary and international collaborations.

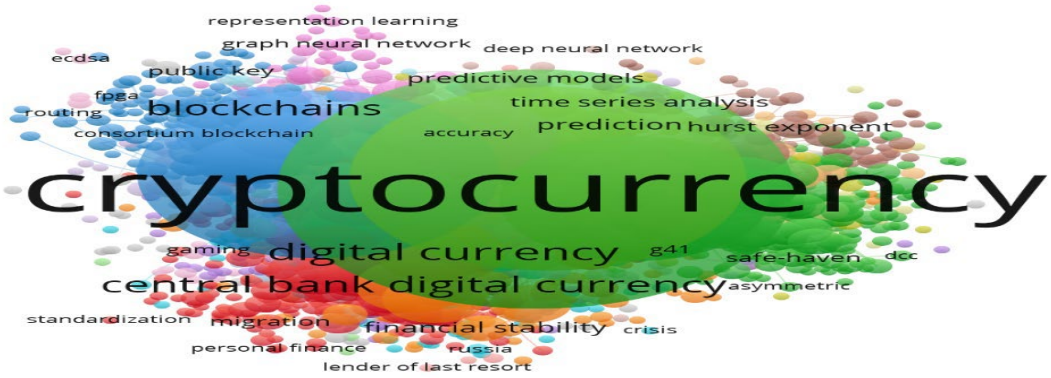
Figure 3. Author Citation Social Network Map



5.4. Keyword Analysis

When the most commonly used keywords in publications on digital currencies were examined, at least "1" publication and at least "3" keywords were selected and 1,679 links were identified among 1,721 publications and the keyword map in Figure 4 was created. It was found that the most recurring words include cryptocurrency, digital money, central bank digital money, blockchain.

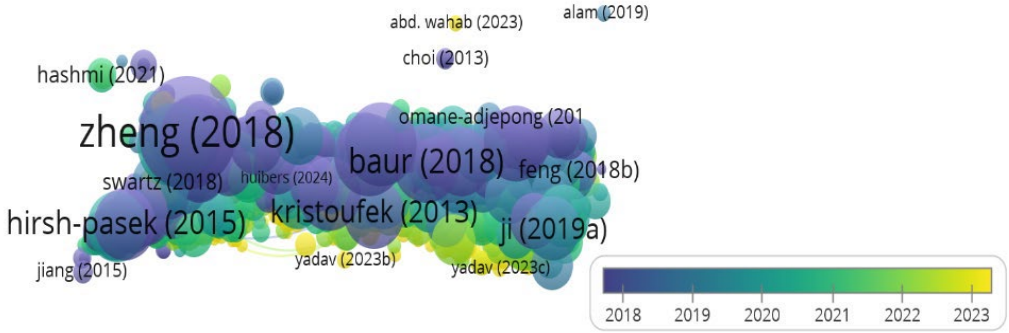
Figure 4. Keyword Map



5.5. Bibliographic Coupling of Documents

Bibliographic text matching analysis is used to determine the citation of a common work cited by two independent sources. In the context of the analysis, 3,449 publications with links between 3,600 publications with a citation value of at least "3" were included in the network connection due to the high number of citations. In the bibliographic text matching map in Figure 6, the publications with the most bibliographic matching links are Zheng (2018), Baur (2018), Hirsh-Pasek (2015), Kristoufek (2013) and Ji (2019a).

Figure 5. Bibliographic Text Match Map



6. EVALUATION AND CONCLUSION

This study aims to quantitatively analyze the global landscape of research on digital currencies. The research includes studies related to digital currency, cryptocurrency, and CBDC, and the clustering of these keywords in the literature is significant both in the business world and for future research. Therefore, it's important to examine the scope, methodology, and limitations of these concepts and their practical applications.

A total of 7,930 articles in the Web of Science database were analyzed on various aspects of digital currency, cryptocurrency and CBDC. In this context, the spatial distribution of publications, the number of publications and citations by years, the countries and authors with the highest number of publications, the most cited publications and the universities with the highest number of publications were analyzed by bibliometric analysis. In addition, the links between authors and countries were visualized with social network analysis. Studies under the umbrella of digital currency have shown a significant increase, especially between 2017 and 2023. Since 2017, there has been a rapid growth in the number of publications and citations, indicating that digital currencies have become the center of academic attention. However, the decline in the number of publications and citations observed since 2023 is interpreted as the academic interest in this field has reached saturation or the research field has changed direction. As for the spatial distribution of studies on digital currencies, it was found that most of the studies were concentrated in the fields of business and economics (44%) and computer sciences (19%). This finding shows that digital currencies are a phenomenon that deeply affects both financial systems and technological infrastructures. The fact that engineering and other disciplines also follow this field emphasizes that digital currencies have become a multidisciplinary research topic. When the countries that contribute the most to digital currency research are analyzed, it is found that the USA, China and the UK are in the top three on a global scale, respectively. The US is the largest contributor to this field with 1,182 publications, while China and the UK also exhibit significant scientific productivity on digital currencies. In addition, it is concluded that digital currencies have become an important research area in both developed and developing countries on a global scale. Moreover, the fact that countries such as India, Japan and South Korea are at the forefront of active research in this field shows that digital currencies have a significant impact not only in the Western world but also in Asia.

When analyzing the authors who have made the most contributions to the field, Elie Bouri stands out with 44 publications. Following him, Andrew Urquhart, John W. Goodell, Larisa Yarovaya, and Zibin Zheng also make significant contributions to the literature.

Additionally, the involvement of prestigious universities such as the London School of Economics and Political Science demonstrates how seriously digital currencies are regarded academically and indicates that this subject is supported by advanced research.

This study provides a comprehensive global analysis of the digital currency literature and makes a significant contribution by adopting a holistic perspective. It elucidates the evolution of academic output on digital currencies and central bank digital currencies (CBDCs) over time. In particular, the study is noteworthy for identifying a declining trend in digital currency–related publications since 2024, thereby offering important insights into the recent dynamics of the field.

Despite its contributions, the study has certain limitations. First, the analysis is confined to articles indexed in the Web of Science database, which results in the exclusion of relevant studies published in other databases. Second, although bibliometric and social network analyses are effective in capturing the structural and quantitative characteristics of the literature, they provide only a limited reflection of the substantive depth and contextual nuances of individual studies.

The analysis indicates that future research on digital currency frameworks will focus on decentralized finance (DeFi), blockchain technologies, and the sustainability of digital assets. Additionally, CBDC and the regulation of cryptocurrencies are emerging as key research areas expected to gain more attention both nationally and internationally. Finally, the bibliometric and social network analyses presented in this study offer a comprehensive view of the scholarly development of digital currencies, current research trends, and important projections for future exploration.

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