



## Bibliometrics Analysis in Digital Economy Based on Citespace

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### Abstract

In recent years, digital economy, as an emerging economic form, has gradually become active in the public's vision, which has greatly promoted the transformation of people's lifestyle. At present, there are endless studies on digital economy, but they are too one-sided. This paper adopts the visualization tool "CiteSpace" to carry out bibliometric analysis in the field of digital economy, and conducts research from three dimensions: statistical analysis, cooperative analysis and co-occurrence analysis, providing relevant reference and inspiration for future scholars engaged in research in this field.

**Keywords:** digital economy; CiteSpace; bibliometrics

### 1. Introduction

Digital economy is an economic form based on digital computing technology, which is based on a new generation of information technology and appears after agricultural economy and industrial economy. Digital economy is not equal to virtual economy, it is a broader concept that covers economic development forms that directly or indirectly use data to direct resources to play a role. Typical applications of the digital economy include "new retail", "new manufacturing", etc., all of which utilize emerging technologies such as Big Data, Cloud Computing, Internet of Things, Blockchain, AI, and 5G communication to achieve optimal allocation of resources and productivity improvement. However, most of the current research on digital economy focuses on specific aspects and lacks a macro and comprehensive perspective to summarize and analyze these fragmented articles. In order to comprehensively understand the research and development process of digital economy, research hotspots over the years, and grasp the future development trend of this field, this paper adopts the method of bibliometrics, and based on the visualization tool "CiteSpace", makes a multi-dimensional visual analysis of most literatures on digital economy published from 2013 to 2023 (before December 27). It includes basic statistics, cooperation status, historical hotspots and future trends. This study provides clear summaries for researchers and helps provide references and guidelines for future authors who interested in pursuing research in this field.

### 2. Method

#### 2.1. Search and selection process

All the data sources in this paper are derived from the three core collections of the Web of Science, which are the Science Citation Index Expanded (SCIE), the Social Sciences Citation Index (SSCI), and the Arts & Humanities Citation Index (AHCI). On December 27, 2024, we selected the target resources by the following steps (Table 1):

**Table 1.** Search Processes of Data Sources.

Steps	Options	Operation
1	Source	SCIE, SSCI, and AHCI
2	Topic	"digital economy"
3	Document Type	"Article" or "Review"
4	Language	English
5	Date Range	2013-01-01 to 2023-12-27

After searching through the above steps, 1096 relevant literatures were initially obtained, and after careful checking, 8 irrelevant literatures were eliminated, and 1088 literatures were finally retained as formal analysis data

## 2.2. Analysis Tool

The analysis tool in this study is CiteSpace, versions 6.2.R3. CiteSpace is software for bibliometric analysis and knowledge visualization, which helps researchers better understand dynamic changes and critical research results and helps guide future research direction and decision-making.

## 3. Results

### 3.1 Statistical Analysis

#### 3.1.1 Number of publications per year

Figure 1 shows the amount of core literature published on the topic of "digital economy" in the last 10 years. In general, the number of literatures published on the topic of "digital economy" has shown a rapid rise in the past decade, and the growth rate is accelerating. Specifically, it can be roughly divided into the following sections. In the first stage, from 2013 to 2015, the annual publication of literatures on the topic of "digital economy" was very small, and the annual publication was stable at about 5. The second stage was from 2015 to 2019, during which the number of papers published on the topic of "digital economy" increased slowly, which may be attributed to the development and progress of

information technology, such as the application of big data, which improved the efficiency of data management and greatly promoted the development of digital economy<sup>[1]</sup>. The third stage is from 2019 to the end of 2023, during which the annual publication of literature on the topic of "digital economy" shows an astonishing growth rate, almost doubling every year. In 2019, the number of publications on the topic was 35, and in 2023, the number of publications on the topic reached 457, which is about 13 times the number of annual publications in just five years. This exaggerated growth rate is obviously different from the fluctuating growth mode that has been studied in other fields<sup>[2]</sup>. It can be seen that the research heat of "digital economy" has exploded in recent years and has become the direction that scholars are studying recently. The reason behind it is likely that the rapid development of information technology such as Blockchain, 5G and AI has led to the accelerated transformation of the digital economy around the world<sup>[3]</sup>. With the progress of digital technology, People's Daily life has brought earth-changing changes, which has attracted more and more attention from scholars and become one of the hot discussions that cannot be ignored in recent years.

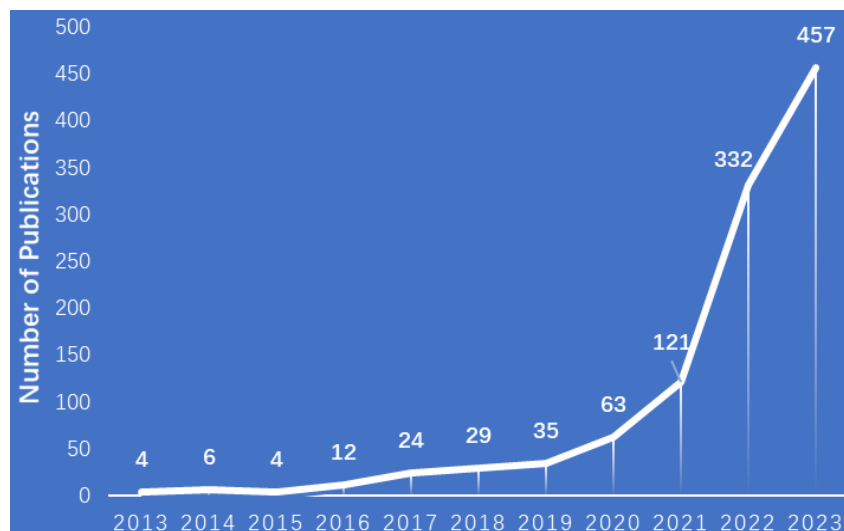


Fig 1. Publications per Year (2013-2023)

## 3.2 Collaboration Analysis

### 3.2.1 Authors Collaboration

Figure 2 shows the author's collaboration network clusters with 300 nodes and 166 links (Only the obvious nodes and links are captured in the figure). Among them, the size of the node is related to the number of cooperation, the more cooperation, the larger the node; The lines represent cooperative associations between authors. In summary, we have the following findings: (1) The connections between nodes are relatively loose. As can be seen from the dispersion of nodes and the number of connections in the figure, there is a lack of close connections between nodes. This shows that the intensity of author cooperation in the field of "digital

economy" is not obvious. (2) Collaborators tend to cooperate with local authors. From the lines in the figure, we find that there is strong regionalism among collaborators, that is, authors in one country or region tend to cooperate with local authors. For example, Dong, Kangyin, Dong, Xiucheng and Wang, Jianda were all from China. Their joint research directions included the impact of China's digital economy on the global energy transition, and how China's digital economy promotes high-quality energy development, etc.<sup>[4, 5]</sup>. Gaspareniene, Ligita and Remeikiene and Rita are two scholars from Lithuania, and their joint research direction is the concept of digital shadow economy and related determinants<sup>[6]</sup>.

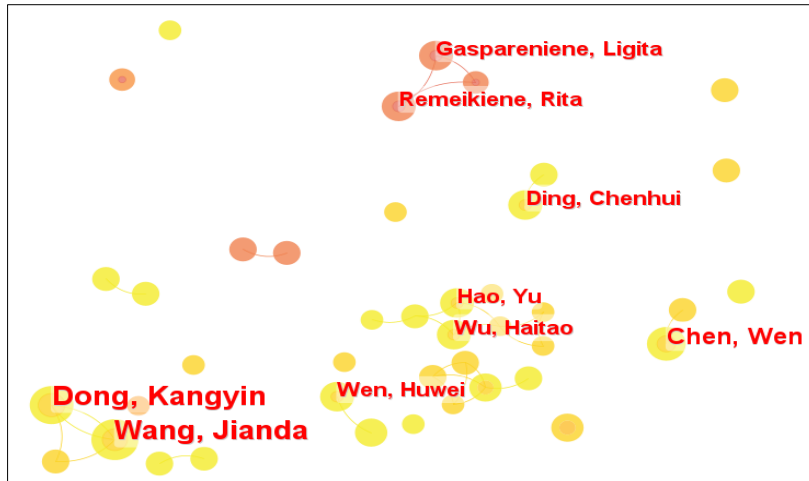


Fig 2. Author Collaboration Network.

**3.2.2 Institution Collaboration**

In Figure 3, the number of nodes is 299, the links are 244, and 8 clusters are obtained. After screening, the first four most significant clusters were shown. In general, the links between nodes in various clusters are rich, but the connections between clusters are lacking. Specifically, (1) The cluster with the richest nodes is #0 environmental regulation. The two most obvious nodes are Zhejiang University of Technology and Nanchang University. The main research direction of this cluster is how environmental management, digital development and technological innovation affect the performance of China's green economy [7]; The impact of green economy and environmental management on enterprises' green technology innovation [8]. (2) #1 environmental effect ranked second in node richness.

Two of the most obvious nodes are Southwestern University of Finance & Economics and Wuhan University. The main research direction of this cluster is the environmental effect of digital economy [9]. (3) The third cluster label is #2 quality management. The two most obvious nodes are the Beijing Institute of Technology and the Central University of Finance & Economics. The main research direction of this cluster is to investigate whether digital can accelerate the realization of "carbon neutral" quality management [10]. It is not difficult to find that most of the current research on the digital economy is related to the environment, indicating that the digital economy has played an important role in promoting the transformation of the green economy, and future scholars can continue to dig in this direction.

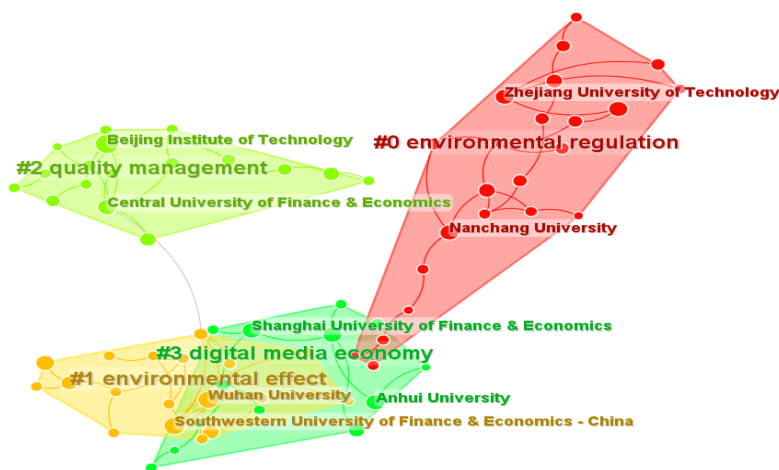


Fig 3. Institution Collaboration Network

**3.3 Co-occurrence Analysis**

**3.3.1 Keywords Burst**

Keyword burst shows the keywords that have been cited frequently in the field of "digital economy" in the past 10 years. It reflects the research hotspots in this field in certain periods, and dynamically shows the evolution of research hotspots. Figure 10 shows the top 19 keywords with the strongest citation from 2013 to 2023. Specifically, we find that: (1) The earliest and longest burst keyword is "political economy", and the strength is high (5.37), indicating that digital economy was mainly related to political economy research ten years ago, reflecting that the development and growth of digital economy in recent years benefited from

political guidance and support. (2) The word with the highest burst strength is "gig economy" (8.87). Its burst time began in 2017, and the heat lasted until 2021, as long as four years, indicating that during this period, many scholars began to focus on the impact of the digital economy on the gig economy. For example, some scholars have explored how digital platforms can create a gig economy [11]. (3) In the middle of this decade, most scholars were keen to examine the derivative economy brought about by the digital economy, such as the burst keywords "gig economy", "sharing economy" and "digital shadow economy". This shows that the development of the digital economy has promoted the operation and progress of many branch

economies. (4) Recently, many scholars have shifted the focus of digital economy research to the technical level. Such as burst keywords “artificial intelligence”, “networks” and “technological progress”. It shows that the long-term development of the digital economy cannot be separated from the drive of technology, and it is a relationship that complements and

promotes each other. We have noticed that the latest burst keyword is “technological progress”, which indicates that the recent research focus of scholars is on the relationship between digital economy and technological progress, which also provides clues for the future research direction of digital economy. In the future, scholars will likely continue to focus on this direction.

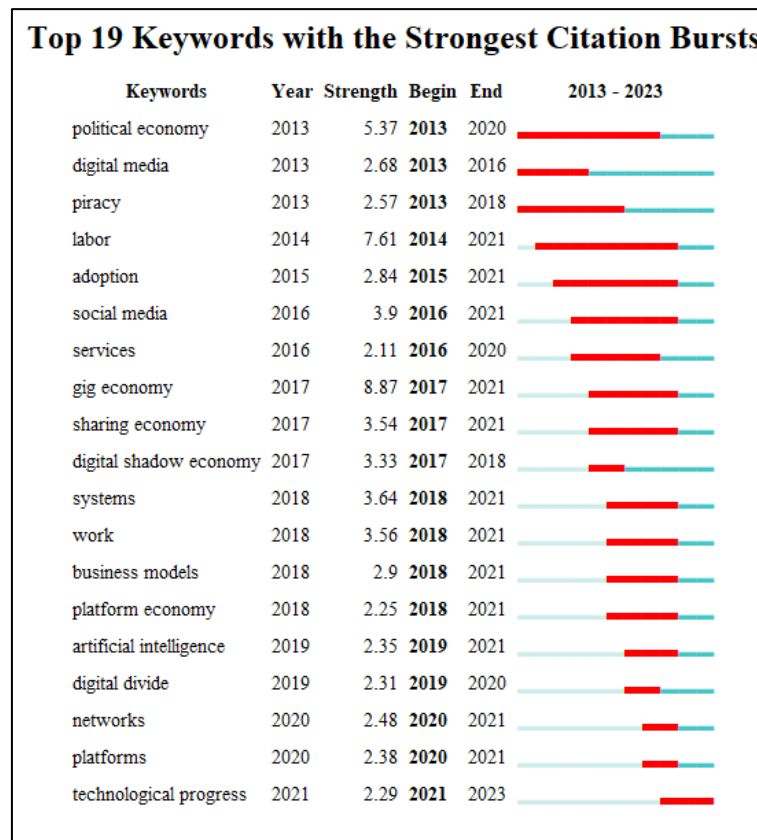


Fig 10. Top Keywords with the Strongest Citation Burst.

4. Conclusions

This bibliometric study takes “digital economy” as the research topic; the sources are papers in SCIE, SSCI, and AHCI on the Web of Science, and data visualization analysis is carried out based on the literature analysis software CiteSpace. Specific studies are conducted from three dimensions (statistical analysis, collaboration analysis, and co-occurrence analysis), and the results are easy to interpret and predictive. The following are the main conclusions, which are framed in terms of “the results are suggested by CiteSpace”.

1. From the perspective of statistical analysis, we concluded that the number of publications on the topic of "digital economy" has increased rapidly in the past 10 years, which indicates that this field has received more and more attention in recent years.
2. From the perspective of collaboration analysis, we concluded that the authors lack the enthusiasm of cooperation, and the way of cooperation shows obvious regional characteristics. Institutional cooperation is very frequent, but most of the institutions with the most active cooperation are Chinese universities, which indicates that the institutional cooperation lacks the participation of international institutions, and the research on digital economy is not global.
3. From the perspective of co-occurrence analysis, we find that the focus of research on digital economy is mainly related to information technology and the impact of digital

economy, and the research direction of future scholars is likely to be the correlation between digital economy and technological progress.

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