Scientometric analysis of financial technology and innovation under digital transformation

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Abstract. With the rapid development of science and technology and the advancement of digital transformation, financial technology and innovation have received widespread attention around the world. This article conducted a systematic search on the Web of Science (WoS) database and used scientometric analysis methods to select 116 research papers retrieved from 1900 to 2023. And use Vosviewer and Bibliometrix software to visualize the paper data. The results show that this research topic has shown rapid growth from 2017 to 2023, and four groups of keywords, including digital transformation, digital economy, financial technology, and e-commerce, have contributed the most to the research. Among the subject countries, China, the United States, and the United Kingdom are the most important in this field.

Keywords: financial technology, digital transformation, innovation.

1 Introduction

The combination of traditional finance and digital technology has formed financial technology (FinTech), which is gradually changing the financial service model. The development of FinTech promotes innovation in commercial banks and also drives the digital transformation of commercial banks[1]. While FinTech has facilitated the digital transformation of commercial banks, it has also impacted their micro-level risk management[2]. The financial industry has undergone several changes. One of these changes is the emergence of FinTech companies, posing significant challenges to traditional commercial banks[3]. FinTech and big technology can bring about improvements in the business models of banks in five main areas, including introducing specialized platforms, reaching overlooked customer segments, enhancing customer choices, reducing operational costs, and optimizing banking processes[4].

In today's digital age, the financial industry is undergoing unprecedented changes[5]. The rise of FinTech and the acceleration of digital transformation are altering the ecosystem of traditional finance. Simultaneously, innovation plays a crucial role in driving

K. Elbagory et al. (eds.), *Proceedings of the 9th International Conference on Financial Innovation and Economic Development (ICFIED 2024)*, Advances in Economics, Business and Management Research 281,
https://doi.org/10.2991/978-94-6463-408-2_12

the transformation of the financial industry[6] [7]. In this context, scientific metric analysis, as an effective research method, provides robust support for in-depth studies on the interaction between FinTech and innovation under digital transformation[8].

2 Data and Methods

To further obtain relevant literature on FinTech and innovation under digital transformation, this article conducted an advanced search query on the WoS database:

TS=("financial technology" OR "FinTech" OR "regulatory technology" or "Insurtech") AND TS=("Digital Transformation*" or "Green Digital Transformation" or "Digital Economy" or "Digital Eco-system*" or "Digital Ecosystem*")

WoS is the world's largest comprehensive academic information resource covering most disciplines. This article contains a total of 116 articles (including SCI-EXPANDED, SSCI.) on 14.12.2023. The total number of citations for these papers is 1569, with an average number of citations per article of 13.53 and an h-index of 21. Mapping was performed using VOSviewer and Bibliometric software.

3 Research Findings

This paper presents the annual production trend, a map based on the author's keyword co-occurrence network, and national citation relationship, and a thematic map and visualization analysis.

3.1 Annual Scientific Production

The data shows that there were no articles published before 2017. A small number of articles were published in 2017, and the growth rate was rapid from 2017 to 2023, reaching a peak in 2023.

3.2 A map based on author keyword co-occurrence network

Figure 1 shows the mapping results of the co-occurrence network of 28 authors' keywords. Four main clusters can be clearly divided, as explained below:

3.2.1.Red "digital transformation" cluster

The red cluster focuses on digital transformation and combines information technology and artificial intelligence research. We can see from the figure that digital transformation is affected by factors such as user acceptance, technology, transformation, and management digitalization impact.In particular, artificial intelligence continues to develop and is also the focus of research in this field.

3.2.2.Green "digital economy" clusters

The green cluster is dominated by the digital economy, which includes financial technologies such as big data, Bitcoin, blockchain, and cryptocurrency. Among them, blockchain plays an important role as a bridge and has many connections with the other three clusters.

3.2.3.Blue "financial technology" cluster

The blue cluster shows that the driving force for innovation in banking or financial services comes from financial technology, and China plays an important role as a promoter. The development of financial technology has promoted the innovation and digital transformation of commercial banks, and through digital transformation, bank efficiency and operational capabilities can be improved[9].

3.2.4.Yellow "e-commerce" cluster

The yellow cluster contains keywords related to e-commerce, such as Internet, model, and trust, and is the smallest of the four clusters.

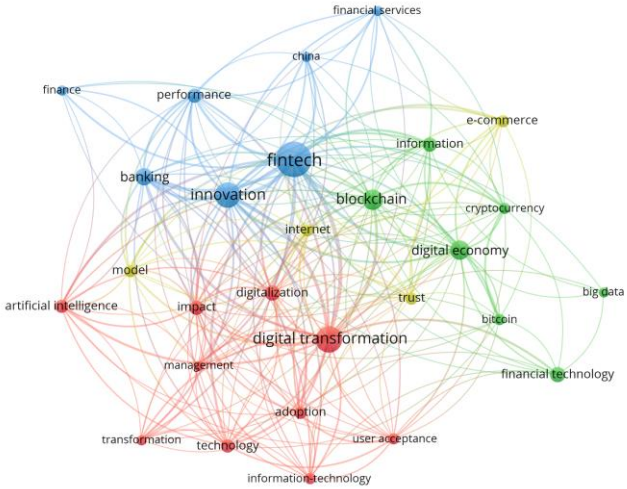

Fig. 1. A map based on author keyword co-occurrence network: clustered outcomes

3.3 National citation relationship

Figure 2 shows country co-citation relationships. The relationship description in this field involves 6 clusters, covering 14 countries. The node representing "China" in the red group is the largest in the figure, and it also belongs to the same cluster as Romania and India. The green group headed by "Britain" includes Pakistan and Scotland; this data branch not only forms a closer connection with China's data, but also connects the data systems of the United States, Malaysia and Germany, and also allows the yellow

group to play a role in connecting red and blue. The role of ethnic groups. Malaysia and Italy in the blue cluster and Germany and Spain in the yellow cluster are smaller clusters, and they mainly use the UK as a bridge. The United States in the blue cluster is the second largest node after China, mainly including Australia, while the purple cluster includes Singapore and South Korea, and mainly has cooperative relations with China, the United States, and Italy.

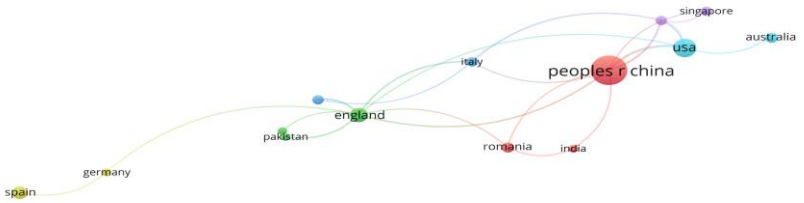

Fig. 2. National citation relationship

3.4 Thematic map

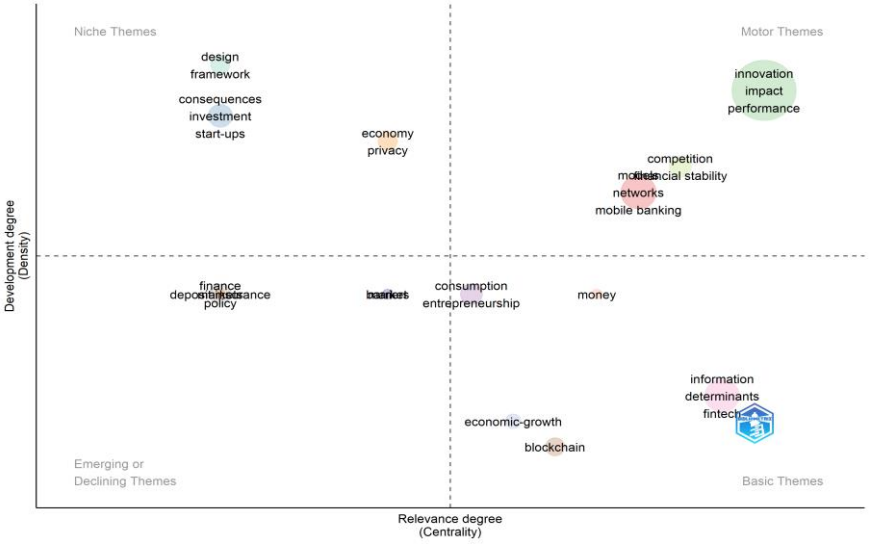

Fig. 3. Thematic map

Figure 3 shows the thematic map of keywords. The Basic themes area includes FinTech, information determinants, blockchain, economic growth, etc. The Motor themes area includes mobile banking, competition, innovation and performance, etc. The Niche themes include design framework, investment, consequences, start-ups, economy privacy, etc. The Emerging or declining themes include finance, sustainable policy, market, etc.

4 Conclusion

FinTech and digital transformation are mutually intertwined, often advancing in tandem. There are seven key relationships between them:

The first point is that FinTech serves as a key catalyst for the digital transformation of the financial industry. The second point is that FinTech companies operate at the forefront of technological innovation in the financial sector. The third point is FinTech focuses on creating customer-centric solutions through digital channels. The fourth point is that digital transformation often involves the optimization and automation of business processes. The fifth point is that FinTech disrupts traditional financial ecosystems by challenging established business models. The sixth point is that many traditional financial institutions collaborate with finTech companies to integrate innovative solutions into their existing operations. The seventh point is that both digital transformation and FinTech emphasize the importance of data.

Finally, there are four sets of keywords corresponding to the most significant contributions in the research, including digital transformation, digital economy, financial technology, and e-commerce. Among the focus countries, China, the United States, and the United Kingdom are considered the most important in this field. This paper provides a new and comprehensive research framework and perspective, offering future researchers a broader understanding of the power of emerging digital technologies in advancing financial technology.

Funding

This study is primarily funded by the Education Department of Guangdong Province, with the grant number SJYLKC2003, titled "API, Machine Learning, and Artificial Intelligence." Additionally, support is provided by the Philosophy and Social Science Planning Project of Guangdong Province, with the grant number GD23XYJ55, focusing on the "Research on the Formulation and Implementation Issues of Sustainable Disclosure Standards with Chinese Characteristics." Partial responsibility for this research is undertaken by Guangzhou South China University.

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