

Analysis of the Progress of Digital Inclusive Financial Research Based on Citespace

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Abstract: First of all, this article collects high-quality documents on Chinese digital inclusive financial research published in the core of Peking University and CSSCI journals in the core of 2016 to 2021. By using CiteSpace software, we can draw a map of author cooperation, institutional cooperation, key word co-occurrence and prominent word detection in this field. Secondly, the article utilizes the information obtained from the graph to extract significant research topics in the field, and conducts a specific analysis of these topics in conjunction with relevant literature. Finally, the article obtains relevant conclusions based on the results of the software and provides some feasibility suggestions.

Keywords: CiteSpace; Digital inclusive finance; Knowledge map

1. Introduction

In September 2016, the G20 Hangzhou Summit released the "G20 Digital Inclusive Finance Advanced Principles" [1]. According to the G20 inclusive financial international partners, digital inclusive finance refers to A sustainable financial services implemented by people. Digital inclusive financial services have the advantages of a wider population, lower financial services costs, and deeper penetration. Therefore, digital inclusive finance has officially become the main way for global financial poverty alleviation. Cui Haiyan (2017) proves that digital inclusive finance has a significant positive impact on the consumption of rural residents in my country [2]. Wu Jinwang and Gu Zhouyi (2018) Based on sorting out digital inclusive finance related documents, we carried out review and analysis from the aspects of definition, evaluation system and consumer education [3]. Ma Cong and Peng Danping (2019) jointly proposed the basic current status of Chinese digital inclusive finance and reporting strategic analysis report [4]. Liang Bang and Zhang Jianhua (2020) analyzed the multi-level data analysis of digital inclusive financial prefecture-level cities, indicating that there is a significant time positive and space gathering effect in the study of digital inclusive finance [5]. Compared with the above perspective, the research data of digital inclusive financial visual data analysis are used with the help of Citespace. This article intends to use CiteSpace software to draw a research blueprint and perform spatial clustering analysis, etc., to further clarify the field of scholars in the field, and explore its research focus, providing important reference for further in-depth research in the subsequent academic community.

2. Data Collection and Method Design

2.1. Data acquisition and processing

According to HowNet data, 2016 is the peak of digital Financial inclusion research, which is mainly due to the convening of the G20 Summit, making digital Financial inclusion widely concerned in this period. Therefore, this paper plans to take the period from 2016 to 2021 as the time span, and use the subject=(digital Financial inclusion) as the search expression. We searched for 426 CNKI articles based on the source categories of articles in Peking University Core and CSSCI journals, and exported them using Refworks format. According to the format requirements of Citespace software, we transcoded the data and retrieved it on December 12, 2022.

2.2. Research Method Design

CiteSpace, whose full name is Citation Space, is a visual citation analysis program developed by Professor Chen Chaomei of the School of Information science and Technology of Drexel College in the

United States using Java language. Because of its large amount of research data and highly visible information atlas of authors, CiteSpace has been widely used in research and analysis fields in various industries. As far as this article is concerned, first of all, the author of digital Financial inclusion will study the situation of its development, so as to grasp the specific situation of its development; Next, the author uses the CiteSpace program to study the collaboration network between authors and institutions, in order to understand their collaboration situation and the distribution of core author groups; Finally, the author analyzes the research hotspots and frontiers in this field through keyword co-occurrence and word detection. Specifically, the time slice of this article is 1 year; In the network node of the CiteSpace program, the author selects Author, Institution, and Keyword.

3. Result and Analysis

3.1. Analysis of statistical situation of publications

3.1.1. Volume analysis of publications

The number of papers to some extent reflects the research enthusiasm and level in this field. The analysis of the number of publications can not only understand the current development status of this research, but also help predict future development. Therefore, taking the number of publications as the vertical axis and the date of publication as the horizontal axis, a growth curve of the annual total number of publications is plotted, as shown in Figure 1. Due to the incomplete statistical work for 2022 and the incomplete literature data on CNKI, the predicted value for 2022 is represented by a dashed line.

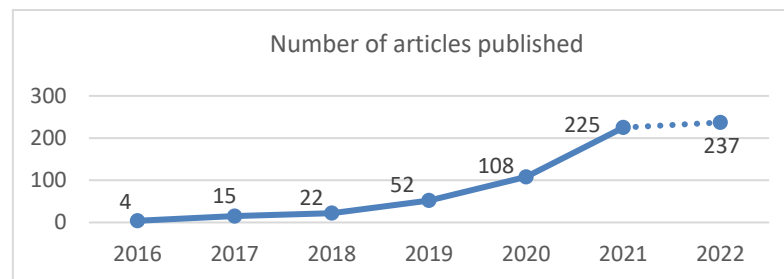


Figure 1: Run chart of the number of digital Financial inclusion documents issued

From Figure 1, it can be seen that since the G20 Summit, research on inclusive digital finance in China has entered the perspective of top scholars in China since 2016. At the core of Peking University, a total of 4 papers were published that year; The number of articles published in the following two years slightly increased, with an average annual increase of 9 articles over the two years; With the development and practice of inclusive digital finance in China, scholars' understanding of this field is gradually deepening. With the release of the second Digital Financial Inclusion Index, a large amount of scientific data has been provided to support research in this field. The number of papers in this field has doubled annually within three years, reaching 52 by 2019, 108 by 2020, and 225 by 2021. In summary, the research on inclusive digital finance in China is showing an increasing trend year by year.

3.1.2. Analysis of published journals

It can be seen that among the 426 sample data, the distribution of articles in the top ten journals is mainly based on "Quantitative Economic, Technical and Economic Research", with a total of 6 articles and the highest number of published articles; Following closely are 5 articles in "Reform" and 4 articles in "Economic Geography"; In addition, "Economic Research", "Agricultural Economic Issues", "Economics" (quarterly), "Agricultural Technology Economy", "Financial Research", and "Economic Review" all have 3 articles; Finally, there are two articles in China Rural Economy, which can be found that the literature in the field of digital Financial inclusion is mostly published in the journals with the theme of economy, finance and rural areas; The number of relevant articles in journals of social sciences such as Journal of Zhejiang University, Journal of Wuhan University, Educational Research, Scientific Research Management, etc. is very small, which indicates that there is room for further expansion of the number of articles in this field.

3.2. Author Graph Analysis

CiteSpace is used to analyze the distribution law of authors and cooperation network of digital financial inclusion related research, which is conducive to determining the core authors and cooperation profile in this field. The article sample consists of 151 authors, consisting of 151 nodes and 36 connections. Table 1 lists the names of the top 12 authors with the highest publication volume.

Table 1: Top 12 authors in terms of publication volume

Serial Number	Number of publications	author
one	five	Zhang Zhengping
two	four	Wu Qingtian
three	four	Wu Jinwang
four	four	Zhou Li
five	four	Ge Heping
six	four	Gu Zhouyi
seven	three	He Yiqing
eight	three	Liu Ziqiang
nine	three	Yin Yingkai
ten	three	Zhang Tian
eleven	three	Hui Xianbo
twelve	three	Huang Yiping

As shown in Table 1, Zhang Zhengping, an associate professor of the Department of Finance at the School of Economics of Beijing Technology and Business University, ranks first in China in the number of papers in this field. During the five years from 2016 to 2021, he published five research papers on digital Financial inclusion at the core of Peking University and at CSSCI. In addition, Wu Qingtian, Business School of Central South University, and Huang Yiping, head of the Data and Finance Research and Development Center of Peking University, are also paying attention to this field. At the same time, the degree of connectivity between nodes in the atlas can also indicate the scale of cooperation. For example, Jiang Pengcheng and Jiang Hongli from Shanghai University of Finance and Economics have studied the financial investment behavior of digital finance and real enterprises, and have cooperated with Professor Zhou Pengfei and Shen Yang from the School of Economics and Management of Chongqing Normal University. However, there is not much cooperation between college teachers and employees of commercial banks, exchanges and financial technology enterprises. In general, the above authors have set up some cooperation networks based on their institutions, which effectively promoted the development of digital Financial inclusion research. However, there are many problems such as more articles and less cooperation. They need to strengthen cooperation and communication with other authors under the premise of giving full play to their core advantages, and then promote the long-term development of research.

3.3. Institutional Cooperation Analysis

The paper involves 151 publishing units. As shown in Table 2, the number of papers of data financial research and development institutions of Beijing University is the largest, reaching 9; There are 13 institutions with more than four papers, accounting for 8.6% of the total number of institutions, covering all levels of colleges and departments and research and development institutions, including the School of Economics and Management of Southwest University, the School of Finance of Zhongnan University of Economics and Law, the School of Economics of Beijing Technology and Business University, and the Digital Finance Research Center.

The size of the font used to draw a network diagram of institutional cooperation indicates the size of the organization's publications, and the thickness of the connections between nodes also indicates the organization's collaborative ability. The results show that: firstly, the clustering module value Modularity (Q value) is 0.9604, and a value greater than 0.3 indicates a significant clustering structure; Secondly, the clustering average contour value Silhouette (S value) is 1, and a value greater than 0.7 indicates a high degree of persuasiveness in the clustering results; When the grid density is only 0.0043, it indicates that the cooperation level of the institution is not high. To sum up, the central nodes of the inter agency cooperation network diagram are basically affiliated units of the core authors, which means that the core institutions play a key role in the research of digital Financial inclusion. At the same time, universities should also strengthen cross collaboration with commercial banks, exchanges, and financial technology institutions to enhance the practicality of research.

Table 2: Number of Documents Issued by Institutions

Serial Number	Number of publications	Institution Name
one	nine	Peking University Digital Finance Research Center
two	eight	Business School of Central South University
three	seven	School of Economics and Management, Southwest University
four	six	School of Public Economics and Management, Shanghai University of Finance and Economics
five	six	School of Finance, Zhongnan University of Economics and Law
six	six	Institute of Finance, Chinese Academy of Social Sciences
seven	six	School of Economics, Beijing Technology and Business University
eight	five	School of Finance, Guangdong University of Foreign Studies
nine	four	Digital Finance Research Center of Beijing Technology and Business University
ten	four	School of Economics, Northern University for Nationalities
eleven	four	School of Finance, Nanjing Agricultural University
twelve	four	Guangdong Institute of Finance and Investment
thirteen	four	School of Information and Internet Finance, Zhejiang Vocational College of Finance

3.4. Keyword co-occurrence analysis

Keywords are the fundamental part of a paper, reflecting both the research centrality and refining the research core of the paper. The analysis of keywords can help people grasp the research focus of current papers in the field of digital Financial inclusion. Therefore, CiteSpace is used to co materialize keywords. 196 keyword nodes and 250 connections have been found in 426 papers. Considering the embodiment of core keywords, this paper will also select the top 10 keywords with strong intermediary centrality, and find "digital finance", "Financial inclusion", "digital economy" "Financial technology", "digital Financial inclusion, etc.", "poverty reduction effect", "financial poverty alleviation", "digital currency", "information disclosure", "urban and rural residents", "resident income" and other keywords are frequent and highly oriented, which have become the focus of experts. Based on this, the relevant materials were carefully read, and it was believed that the current discussion focus on the following three aspects of digital Financial inclusion.

3.4.1. Digital Financial inclusion and digital development

The theme of digital Financial inclusion and digital development consists of the keywords "digital finance", "digital economy", "financial technology", "digital Financial inclusion, etc." and "digital currency". Digital finance is a new financial service that combines traditional financial industries through the Internet and information technology. It generally uses traditional finance and the Internet as carriers, mainly including internet payments, mobile payments, online banking, and online loans. For example, Alipay, WeChat, mobile banking, Internet fund trading platform, etc. belong to the category of digital finance. Digital Financial inclusion services refer to inclusive financial services under the above data finance mode^[6]. Under the background of the rapid development of digital technology, the digital economy has become a new driving force of China's economy, and the economy and finance are closely linked and inseparable. Digital Financial inclusion, due to its low cost, wide coverage, attention and high efficiency, highlights the development characteristics of the digital process at this stage. In addition, the vigorous development of China's digital finance has significantly promoted the construction of digital Financial inclusion. Fintech enables Big data twins to help transform and upgrade financial digitalization. It can be seen that the vigorous development of digital Financial inclusion is inseparable from the promotion of digital process.

3.4.2. Digital Financial inclusion and rural development

The theme of digital Financial inclusion and rural development consists of keywords such as "Financial inclusion", "poverty reduction effect", "financial poverty alleviation", "urban and rural residents" and "residents' income". On the development and poverty reduction effects of digital Financial inclusion, financial poverty alleviation, etc., Gu Zhilan (2021) found that digital Financial inclusion can alleviate rural poverty by promoting economic growth and increasing farmers' income. Xu Ningning (2021) found that the development of digital Financial inclusion is conducive to farmers' income increase by using the ordinary panel model. The theoretical discussion on the residents' income

of digital Financial inclusion services has been quite mature. Scholars can conduct theoretical exploration on the residents' income effect of digital Financial inclusion through time linear or nonlinear simulation, and even through spatial Durbin simulation. The research results of Li Xiaozhong and Pan Zhiqian (2021) show that digital Financial inclusion helps to narrow the income gap between rural and urban areas, and has a greater driving role in narrowing the income gap between rural and urban areas in the central and western regions^[7]. In a word, it is more important to start with the inclusive function of digital Financial inclusion and analyze the impact mechanism of poverty reduction and income increase in rural areas and urban-rural income gap.

3.4.3. Digital Financial inclusion and enterprise development

The theme of digital Financial inclusion and enterprise development includes keywords such as "information disclosure". Enterprises inevitably need to raise funds during their development process, and due to information asymmetry, they need to bear costs during the financing process, making it difficult and expensive to raise funds. Hu Guyue (2020) believes that the absence of an effective information disclosure system will cause serious information asymmetry between investors and financiers, which will lead to discrimination in online loan consumption patterns, herding effect, high-risk interest mismatch, rigid cashing and other problems, thus reducing the fairness and availability of finance, making it difficult to achieve high-quality Financial inclusion, thus hindering the development of digital Financial inclusion. In the face of the COVID-19, digital Financial inclusion, with the help of network advantages and government policy guidance, issued loans to the vast number of small, medium-sized and micro enterprises to help enterprises overcome difficulties. Su Wenxing (2021) found that SMEs in China face significant financing constraints. Digital Financial inclusion can effectively alleviate financing constraints, and the mitigation effect of depth of use is the most prominent among the three dimensions. In addition, the mitigation effect of digital Financial inclusion on non-state-owned SMEs, SMEs in the eastern region, and SMEs in the high-quality information disclosure group is more obvious. On the whole, in the development process of the post epidemic era, digital Financial inclusion has promoted enterprise development and social stability with Big data and contactless advantages.

3.5. Analysis of Emergent Words

Burst detection can track the sudden increase of digital Financial inclusion in a short period of time, which is a keyword that has suddenly attracted wide attention, and is helpful to judge the development of digital Financial inclusion research field. The article arranges the results based on the start date of appearance, and divides the results into keywords by content, the date when the keywords first appeared, the intensity of their appearance, and the start and end dates of their appearance. The results show that "financial poverty alleviation" is roughly the same as the hot spot analysis mentioned above, while "financial poverty alleviation" is still within the scope of emergence from its inception in 2019, indicating that it will continue to be the object of research for scholars in the future. Li Jianwei and Wang Ning (2020) proposed to adhere to the combination of market leadership and government guidance, and establish a more comprehensive market-oriented inclusive financial poverty alleviation system; Promote the cross-border integration of modern logistics, e-commerce mode, Big data technology and traditional finance, and build a digital Financial inclusion ecosystem; Focusing on the "digital capability+industrial chain", we will promote the innovation of financial Targeted Poverty Alleviation model, accurately connect with the financial needs of the development of characteristic industries in rural poverty areas, and reshape the path of digital Financial inclusion Targeted Poverty Alleviation by using marketization, digitalization, and industrialization strategies. Wang Hua, Cao Chenghang and Li Bokang (2022) used the Biprobe model to study and found that digital Financial inclusion can effectively prevent families from falling into poverty, and the faster regional digital Financial inclusion develops, the lower the probability of farmers falling into poverty^[8]. Ding Zhujun and Sun Yaqin (2022) use GMM model analysis to find that digital Financial inclusion is significantly positively correlated with rural poverty reduction. A large number of other documents also analyze the role of digital Financial inclusion in poverty alleviation from different perspectives.

4. Conclusions and recommendations

By using the author and institutional relationship network of the visualization software CiteSpace, keyword co-occurrence and emergent word detection functions, this paper studies and analyzes the relevant data in the field of digital Financial inclusion, and finds out the development priorities and

cutting-edge issues in this field, providing some valuable references for the future development direction. The research findings are as follows.

4.1. Conclusions

4.1.1. Less collaboration across institutions and provinces

The authors in the field of digital Financial inclusion are mostly college teachers and students, while the staff of banks, exchanges or financial technology companies are relatively few. The cooperation between the authors is mainly between teachers and students, and there is also little cooperation between college teachers and students and staff of financial related departments. At the same time, this study did not break through regional limitations, that is, most of the collaboration is within the same province, and there is relatively little inter provincial collaboration. Narrow collaboration can lead to insufficient breadth and depth of problem-solving, and the final conclusion is prone to one-sidedness and contingency. Academic thinking breaks the existing situation, achieves a grand and solid pattern, focuses on controlling the overall situation, fully integrates the research overview, progress and level between provinces through cooperation, constantly creates a new situation of inter provincial cooperation for a long time, and works together to promote win-win development. The greatness of digital Financial inclusion can be carried out steadily and far.

4.1.2. The research hotspot mainly focuses on "financial poverty alleviation"

In this paper, by means of keyword co-occurrence, prominence word detection and other means, we believe that digital Financial inclusion and the development of the digital economy, the growth of new rural areas, the growth of small and medium-sized enterprises are all hot issues in the development of digital Financial inclusion. Among them, digital Financial inclusion and financial poverty alleviation in growth and development are important frontiers in this field. But in addition, the vigorous development of China's digital Financial inclusion is also inseparable from the Big data industry. The Big data industry has become a key strategic fulcrum to promote the high-quality development of China's economy, and financial technology has inserted wings for Financial inclusion. Financial inclusion under the traditional financial system has a contradiction between commerciality and inclusiveness, and solutions can also be found through technology empowerment. On the one hand, Big data and Internet technologies are used to reduce financial costs, and on the other hand, the sustainable development of the digital economy gradually covers all fields. In the future, we should be more inclined to the combination of digital economy and inclusive benefits, and promote rural revitalization through the use of digital economy to achieve Common prosperity.

4.2. Recommendations

4.2.1. Organize large-scale academic forums to enhance the breadth of participation representatives

Academic forums are the best way to enhance the level and quality of academic exchanges, while the so-called "large-scale" reflects talent as the primary resource, attracting talents from all over the world to attend. Through the integration of "going out" and "inviting in" ideas, various societies and associations within and outside the province are widely invited to participate. At the same time, expanding the time for exchange and study with college teachers and financial institution personnel can, on the one hand, cultivate and improve the academic vision and academic habits of teachers and students, further improve the knowledge structure, expand the vision of teachers and students, broaden the professional vision, and guide many scholars to brave the "no man zone"; On the other hand, it can enhance bilateral cooperation and communication, closely focus on the country's development strategy, achieve equal emphasis on academic theory and practice, and provide a basis for relevant units to make major decisions.

4.2.2. Deeply focus on key areas and enhance academic research competitiveness

Digital Financial inclusion is a new financial service model combining traditional financial technology and Digital transformation technology. The integration of digital technology and inclusive financial technology can enable customers who could not be covered by traditional Financial inclusion services in the past to obtain higher quality financial services at the most acceptable cost, thus expanding the business scope of Financial inclusion institutions, which has an important impact on financial institutions. With the maturity of new technologies such as Big data, cloud computing and blockchain, the deep integration and mutual penetration of finance and technology will change the development pattern of digital Financial inclusion. However, at present, the development of China's

digital Financial inclusion is facing difficulties. Because of the huge economic development gap between urban and rural areas in China, the "digital gap" problem has emerged, and the digital gap and urban-rural income gap have a vicious circle. Numerous academic literature studies on digital Financial inclusion focus on "financial poverty alleviation", but with the rapid development of digital technology, the existence of the "digital divide" will also trigger the Matthew effect, making the rich richer and the poor poorer in China, and the economic situation of rural vulnerable groups should also be further emphasized. In the future, will the effect of digital Financial inclusion on narrowing the gap between urban and rural areas be weakened? Core competitiveness is the key factor for the success of research. Academics focus on the development of digital Financial inclusion and rural revitalization, support the in-depth promotion of rural revitalization through the development of financial services for the real economy, improve the competitiveness of academic research, and then promote the great rejuvenation of the Chinese nation.

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