

Research Status and Trend of Digital Financial Inclusion at Home and Abroad: Visual Analysis Based on VOSviewer

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Abstract: This paper takes a total of 288 articles in the field of digital financial inclusion in the Web of Science database from 2015 to 2022 as a sample, uses VOSviewer to draw the knowledge map of the field of digital inclusive finance at home and abroad, and sorts out and analyzes the research status, hot spots and trends in this field, and finds that: 1) From 2015 to 2022, the number of international digital financial inclusion research publications has increased rapidly and steadily, of which the number of articles published in China is significantly higher than that in other countries. China is a leader in the field of digital financial inclusion; 2) High-output authors and research institutions in the field of digital inclusive finance at home and abroad have initially formed a certain cooperation network, but the degree of cooperation should be further strengthened; 3) There are certain differences and differences in research hotspots and trends at home and abroad, and the focus of research is different due to the specific national conditions of each country.

Keywords: Digital financial inclusion; VOSviewer; Knowledge graph; Visual analytics

1. Introduction

The integration of digital technology and finance is a major trend, and nowadays digital inclusive finance is becoming a way of life and closely integrated with our daily life [1-3]. Digital inclusive finance is to promote the development of inclusive finance through financial technology and digital technology [4-5]; compared with traditional finance, digital inclusive finance can reduce the cost of all aspects of financial services, improve the efficiency of financial services through digital technology[6], mobilize more resources to precisely serve the disadvantaged groups, solve the problem that traditional finance is difficult to be universal and difficult to benefit, and improve the inclusiveness of the financial market [7-9].

Bibliometrics is able to analyze literature data through mathematical and statistical methods. It analyzes and assesses the quality and interest of research and represents the current status and development of a particular field [10]. It has been widely used to explore the literature correlation analysis in research areas and the frontiers of research hotspots [11]. Since digital inclusive finance has been proposed, the research around this direction has been increasing day by day, and it is of great theoretical and practical significance to scientifically sort out the development of digital inclusive finance and the hot frontier [12-14]. Therefore, this paper compares the hot frontiers and future trends of domestic and international research on digital inclusive finance in order to provide some references for future theoretical and practical research.

2. Research Methodology and Literature Collection

2.1 Research Methodology

In this paper, we use the visual analysis software VOSviewer, a bibliometric software developed by Leiden University in the Netherlands, which is able to present a clear clustering network and show node connections through cluster view, label view, and density view, and is unique in analyzing literature keywords, topic clustering, and author information.

2.2 Literature Collection

In this paper, the Web of Science™ core collection is used as the database, limited to SSCI, SCI-EXPANDED and CPCI-S for data collection. The data were retrieved on September 20, 2022, spanning the period 2015-2022. The search formula was set as " $((TS=(Digital\ financial\ inclusion))\ OR\ TS=(Digital\ financ* \ inclusi*))\ OR\ TS=(\ Inclusive\ digital\ finance))$ ", to avoid In order to avoid the unrelated literature of other disciplines from interfering with the scientific nature of the analysis, the categories will then be refined, resulting in 288 valid data, with 89 and 172 valid data for domestic and international literature, respectively.

3. Analysis of research dynamics of digital inclusive finance research literature

3.1 Analysis of publication volume and time of publication

Plotting the trend of domestic and foreign publications in the field of digital inclusive finance, The results are shown in the Figure 1. it can be seen that the overall trend of domestic and foreign literature on the topic of digital inclusive finance from 2015 to 2022 is on the rise, with a large increment from 2019 to 2021.

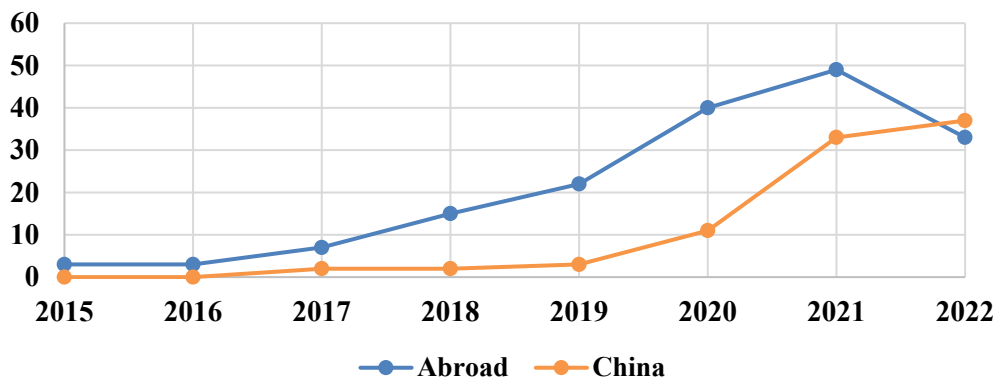


Figure 2: Trends in the number of posts on the topic of digital inclusive finance in China and abroad

In recent years, with the wide application of digital technology in the financial sector, digital inclusive finance has become increasingly hot, and relevant international organizations and countries have introduced a number of policies to promote the development of digital inclusive finance.

Internationally, the G20 released the 《G20 Advanced Principles for Digital Inclusive Finance》 in 2016 and the GPMI released the 《G20 Emerging Policies and Approaches for Digital Inclusive Finance》 in 2017, indicating that digital inclusive financial services for vulnerable groups, consumer protection and education for digital inclusive finance, and digital inclusive finance to empower the sustainable development of small and micro enterprises will become important focus points for the development of global inclusive finance in the long term.

In China, the "Plan for Promoting Inclusive Financial Development" comprehensively elaborates the general idea of promoting inclusive financial development, and several policies released from 2017-2019 focus on digital inclusive financial services for small and micro enterprises and farmers, which fits China's "rural revitalization" and "common prosperity". This is in line with the themes of the times, such as "rural revitalization" and "common prosperity", and reflects the systematic and oriented advancement of China's digital inclusive finance-related policies over time.

In summary, domestic and foreign policies, technologies and business environments have provided a superior development environment for digital inclusive finance, and the research results of domestic and foreign scholars on digital inclusive finance have multiplied and enriched the relevant theoretical foundation.

3.2 Analysis of cooperation of research institutions

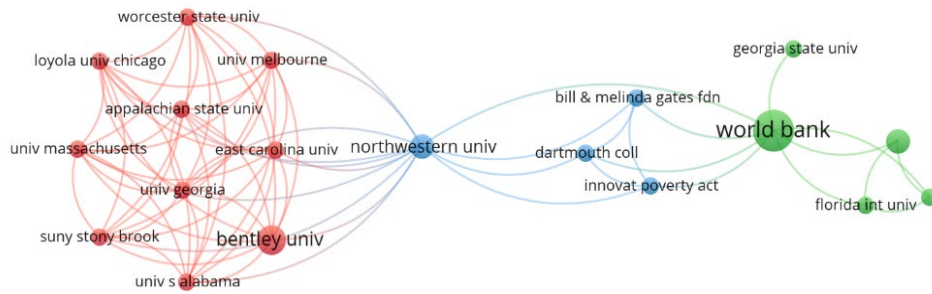


Figure 3: Cooperation map of foreign research institutions

The number of papers published by scientific institutions can represent the research capacity of their fields, and this paper only shows the existence of connected networks. The results are shown in the Figure 4 and Figure 5.

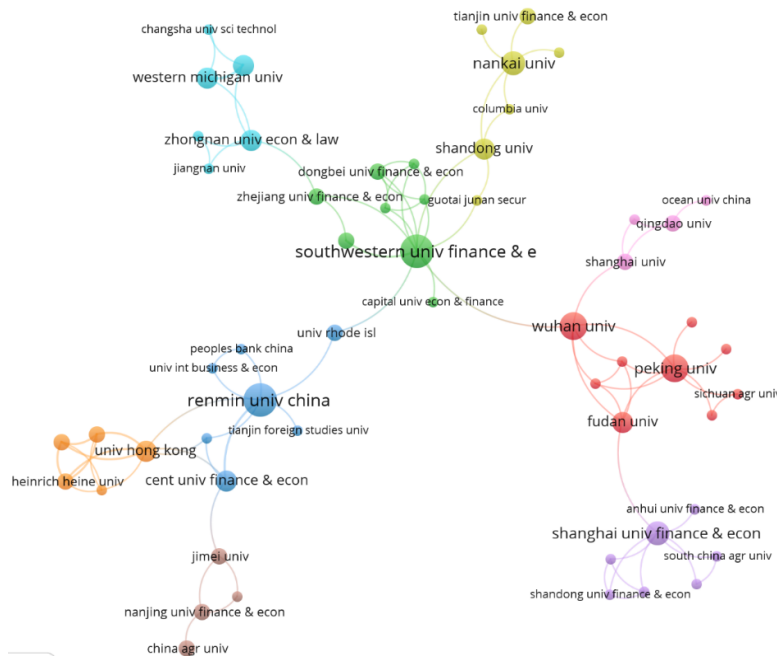


Figure 6: Collaboration map of domestic research institutions

In terms of cooperation among research institutions, both domestic and foreign institutions have formed more stable and mature cooperation networks, which are mostly between universities in China, but mostly between universities in foreign countries, but also between international organizations and non-profit organizations, etc. and universities, among which the cooperation networks in China are more mature. In comparison with the number of publications, the number of publications from the top research institutions in China is also significantly higher than that from the top research institutions abroad, which also indicates that Chinese research institutions are more intensively researched than those abroad.

3.3 Country Collaboration Analysis

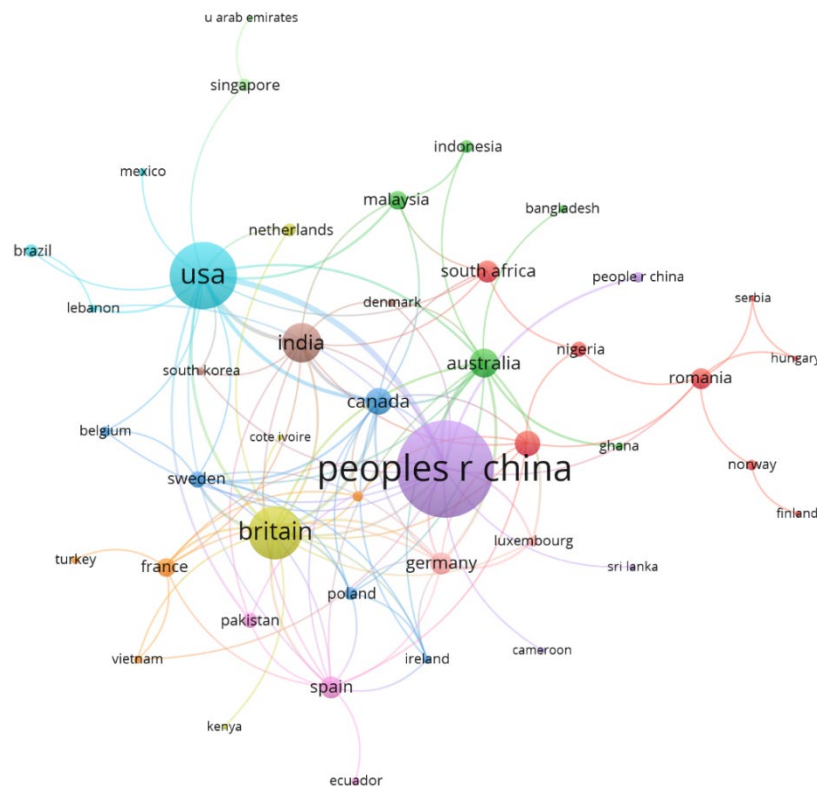


Figure 7: Country Cooperation Map

The 261 papers in the field of international digital inclusive finance were imported into VOSviewer to make a collaborative mapping between countries. The results are shown in the Figure 8.

Since the UK includes four parts: England, Scotland, Wales and Northern Ireland, Britain combines four regions in the map. It can be seen that China is the country with the most articles in the international journals in the field of digital inclusion finance. From the connectivity of the graph, the dense and complex connection between the nodes indicates that there are more collaborative relationships between different countries. Among them, China, the United States, the United Kingdom, India and Australia all have more publications, indicating that these countries are in the relatively central zone of the international digital inclusion finance research field and have more influence.

4. Digital Inclusive Finance Research Hotspots Analysis

4.1 Analysis of foreign research hotspots

Keywords are the core idea condensation of the article. In this paper, we use VOSviewer software to visualize the keywords from the perspective of co-occurrence. In order to make the analysis results more accurate, the keywords are first processed for data cleaning. A total of 899 keywords were obtained from 172 foreign documents, and the keywords with frequencies higher than 2 occurrences were set as high-frequency keywords, the word frequencies were counted, and the clustering mapping was drawn. The results are shown in the Figure 9.

According to the node size of Figure 10, excluding "digital inclusive finance", "financial inclusion" and "financial technology" have the highest frequency and are the two most studied by foreign scholars. In addition, "digital money" and "economic development" are also the hotspots with more attention and research. In the context of background analysis, digital inclusive finance is an innovative product combining financial technology and inclusive finance, and both financial technology and digital money are important means to promote digital inclusive finance, while digital inclusive finance can also promote economic development.

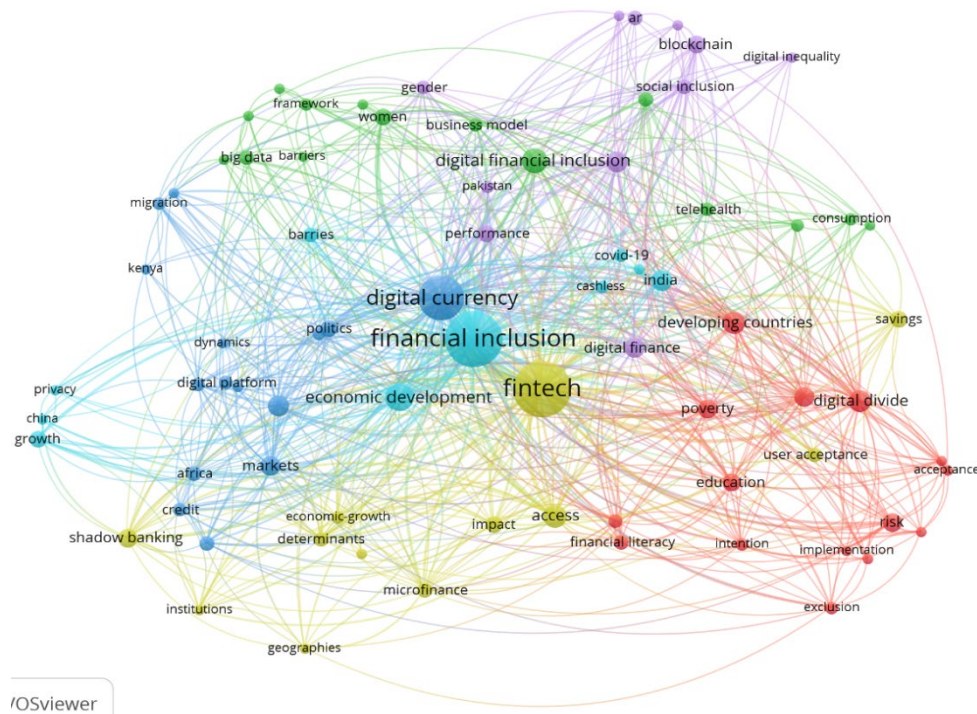


Figure 11: Foreign keyword clustering mapping

Foreign research hotspots can be summarized according to Figure 12 into six major directions: financial inclusion, fintech, digital currency, digital divide, digital finance and digital inclusive finance.

1) Digital Inclusive Finance and Inclusive Finance

Foreign research literature has explored in depth the connotation of inclusive finance and digital inclusive finance, the purpose of inclusive finance is to eliminate poverty and inequality, this part of the study is based on empirical research, exploring inclusive finance to explore the financial mechanism to serve the disadvantaged and meet their financial needs, which focuses on the analysis of inclusive finance by combining digital technology as digital inclusive finance to achieve better inclusive results.

2) Digital inclusive finance and financial technology

At present, most foreign literature has proposed that the penetration of ICT and blockchain and other financial technologies is a decisive factor in determining the development of digital inclusive finance, and focuses on the influence mechanism of financial technologies to promote the development of digital inclusive finance, arguing that digital inclusive finance can provide opportunities for financial support to underserved groups or communities through financial technologies.

3) Digital Inclusive Finance and Digital Currency

Digital currencies have fully electronic characteristics and are also called cryptocurrencies because they use encryption technology to ensure the security of transactions. Much of the foreign literature focuses on Bitcoin's innovative operational mechanisms and impact on digital inclusion by combining digital currencies with payment systems, such as Bitcoin's ability to promote inclusive entrepreneurship and reduce financial exclusion.

4) Digital Inclusive Finance and the Digital Divide

The digital divide refers to the information gap and the trend of further polarization between the rich and the poor caused by the difference in the degree of possession, application and innovation ability of information and network technology in the global digitalization process, which is widespread around the world, and a lot of foreign literature has confirmed that the digital divide is not conducive to the development of digital inclusive finance and that by bridging the digital divide and improving the financial literacy of service groups Only by bridging the digital divide and improving the financial literacy of service groups can we enhance their financial accessibility and thus promote financial poverty reduction, and truly realize the "universality" and "benefits" of digital inclusive finance.

5) Digital Inclusive Finance and Digital Finance

As an emerging field where finance and technology are closely integrated, many overseas studies have focused on whether innovative digital financial services, such as Internet banking, online financing and e-money, contribute to financial inclusion, and have confirmed the key role and influence mechanism of digital financial services in promoting digital financial inclusion.

6) Digital financial inclusion

With the rapid development of financial technology and significant changes in financial service models, global inclusive finance has undergone the evolutionary development of "microfinance → inclusive finance → digital inclusive finance". In the context of increasing global financial competition, it is crucial for countries to adapt to the speed of digital inclusive financial services, and several countries have analyzed the evolution of the connotation of digital inclusive finance in depth and focused on the construction framework to reflect and compare their key levels of financial and digital inclusion.

4.2 Analysis of domestic research hotspots

A total of 241 keywords were obtained from 89 documents in China, and cluster co-occurrence maps were drawn. The results are shown in the Figure 13.

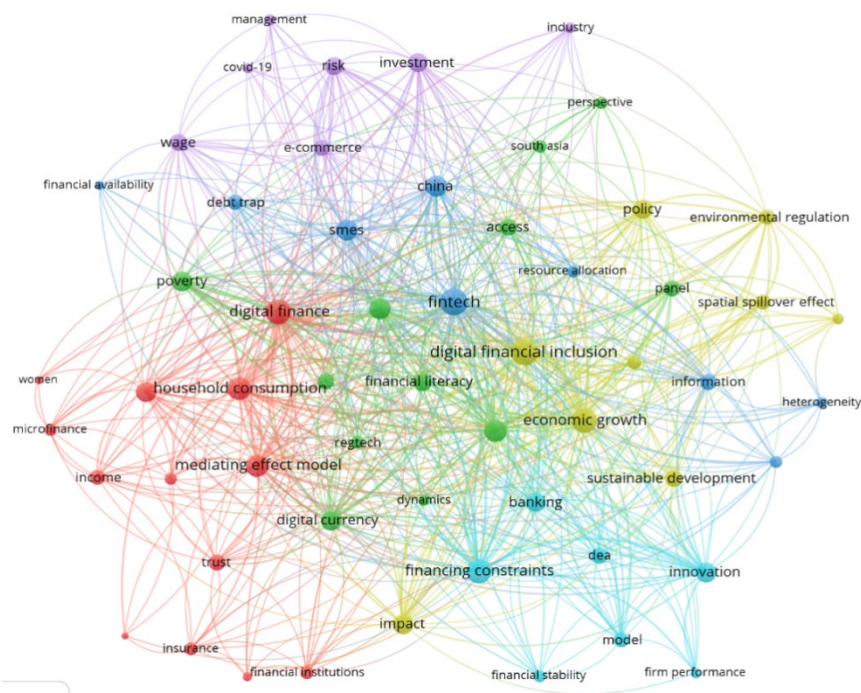


Figure 14: Domestic keyword clustering mapping

According to the node size of Figure 6, excluding "digital inclusive finance", "fintech" has the highest frequency and is the most studied focus of domestic scholars, while "economic growth", "digital finance" and "inclusive finance" are also hot topics. In addition, "economic growth", "digital finance" and "financial inclusion" are also hotspots of relative concern. Combined with China's national conditions and policy analysis, fintech is a new engine to practice inclusive finance, and digital inclusive finance is the product of the deep integration of fintech and inclusive finance, while China focuses on the benefits of digital inclusive finance for the people and enterprises.

According to Figure 6, the research hotspots in China can be summarized into six major directions: digital inclusive finance, financial technology, household consumption, digital money, financing constraints and financial regulation.

1) Digital inclusive finance

As an important core competitiveness of the country, finance needs to play a leading role in the new development pattern; among them, promoting the development of digital inclusive finance has become a national strategic goal, and much domestic literature focuses on the connotation of digital inclusive finance and how to build a responsible framework of digital inclusive finance system, clarify the ideas of digital inclusive finance development, and then make digital inclusive finance better serve the people. The

purpose of this study is to clarify the development of digital inclusive finance, so that it can better serve the people.

2) Digital Inclusive Finance and Financial Technology

Countries all over the world attach great importance to the development of digital inclusive finance. Fintech digital inclusive finance in developed countries such as the United States has the advantage of underlying technology, while Chinese fintech digital inclusive finance has the advantage of scale and greater development potential. Existing domestic literature studies confirm that in the Chinese context, financial resources are promoted through fintech inclusion, and also focus on analyzing the intrinsic mechanism of fintech to promote the development of digital inclusive finance.

3) Digital inclusive finance and household consumption

The rapid development of digital inclusive finance has promoted the change of consumption patterns. Most domestic literature focuses on research examining the effects and mechanisms of the role of digital inclusive finance in promoting residential consumption, confirming the positive impact of digital inclusive finance on household consumption, and exploring that digital inclusive finance can promote household consumption upgrading and common prosperity through mechanisms such as narrowing the income gap and optimizing the employment structure.

4) Digital inclusive finance and digital currency

The use of digital currencies has increased the access of poor people to financial services. The existing domestic literature mainly focuses on summarizing the operation mode and poverty reduction effects of other countries such as Kenya for digital currencies, and analyzes that domestic digital currencies such as digital renminbi can be used to promote financial poverty reduction through the path of narrowing the digital divide, improving the efficiency of the payment system and breaking the data monopoly, while paying more attention to the central bank's digital currency implementation program.

5) Digital Inclusive Finance and Financing Constraints

Financing constraint refers to the restrictions on external financing for enterprises. The existing domestic literature has analyzed the mechanism of the role of digital inclusive finance in alleviating the financing constraints of SMEs, and also analyzed in depth the heterogeneity of the role of digital inclusive finance in alleviating SMEs in terms of property rights, industries and regions.

6) Digital inclusive finance and financial regulation

In order to seek a balance between financial innovation and risk, many domestic researchers and scholars have analyzed the need for regulation and put forward many policy directions and key suggestions. In addition, the use of big data, artificial intelligence and other technologies can help promote the standardization of financial regulation and improve the efficiency of financial regulation.

5. Conclusion and Trend Outlook

5.1 Conclusion

1) From the publication characteristics, the number of domestic and foreign digital inclusive finance research publications grew rapidly and steadily from 2015 to 2022, becoming a research hotspot in recent years. From the cooperation of highly productive authors and research institutions, we can find that there are relatively few international researchers in digital inclusive finance, no long-term theoretical research system has been formed, and the lack of cooperation and communication among research institutions is not conducive to the sustainable development of research.

2) From the keyword co-occurrence, clustering and word frequency statistics, we can find the research hotspots in the field of digital inclusive finance at home and abroad. From the keyword co-occurrences, the research hotspots at home and abroad mainly focus on high-frequency keywords such as financial technology and digital money, and there are close connections among the keywords. From the keyword clustering, scholars at home and abroad have some differences in research hotspots, which is due to the different national conditions of each country and the different focus of research, and the development mode of digital inclusive finance in China is different from other countries.

5.2 Trend outlook

Future research should be based on the existing achievements, combined with the new problems and challenges encountered in the development process of international social reality, and improve the research related to digital inclusive finance with a multi-dimensional perspective.

Foreign countries can advance in the following areas.

1) The path of digital inclusive finance to achieve financial poverty reduction

At present, foreign developing countries such as India, Kenya and South Africa focus on the current social situation to analyze the necessity of developing digital inclusive finance, focusing on the inclusive effect to strengthen the inclusiveness of financial services so that the disadvantaged groups can also get the most basic financial services. China is a world leader in the field of digital inclusive finance, and future foreign research scholars can learn from China's experience in developing digital inclusive finance in terms of policies and explore the practicability of China's model for developing digital inclusive finance in other countries.

2) The impact mechanism of digital inclusive finance development on international trade

The development and application of digital inclusive finance is of great significance in promoting the digitization process of international trade and achieving inclusive growth of international trade. The existing literature only confirms the correlation between financial development and international trade, but does not deeply analyze the mechanism of the impact of digital inclusive finance development on international trade. In the future, foreign researchers can study whether digital inclusive finance can affect international trade through mechanisms such as improving the efficiency of international trade settlement and reducing exchange rate risks.

Domestic can advance in the following areas.

1) Effective measurement of digital inclusive finance index

The measurement of digital inclusive finance index has long faced problems such as single data source, serious data deficiency and lack of clarity in coverage. There is not yet a comprehensive index system that summarizes the current stage of digital inclusive finance. In the future, scholars can strengthen the tripartite collaboration among the government, financial institutions and research institutions to build a more perfect measurement system of digital inclusive finance.

2) Research on the influence mechanism of digital inclusive finance and common prosperity.

The goal of common wealth is to realize the common wealth of all people, and the goal of digital inclusive finance is also to achieve "universal" and "beneficial", and provide financial support to the disadvantaged groups, which are essentially the same. The existing literature mainly focuses on digital inclusive finance in alleviating financing constraints and optimizing people's consumption.

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