Analysis of the Current Status and Development Trends of Inclusive Finance Research Based on Knowledge Graph

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Abstract. This paper uses bibliometric analysis and visualization techniques to analyze the research status and trends of inclusive finance at home and abroad. Domestic research, starting in 2006, focuses on rural revitalization and digital finance with policy-driven characteristics. International research, beginning in 2017, emphasizes cross-country comparisons and theoretical models on sustainable development. Domestic and international studies differ in focuses and methods, and future research should strengthen multi-scenario case studies and interdisciplinary collaboration.

Keywords: Inclusive Finance, Digital Finance, Rural Revitalization, Bibliometric Analysis, Sustainable Development;

1 Introduction

Inclusive finance, as a core area of global financial innovation[1], aims to overcome the "last mile" bottleneck of traditional financial services through digital technologies, providing accessible financial services to disadvantaged groups such as rural residents and micro-and-small enterprises. In recent years, with the deep integration of digital technologies and financial services, inclusive finance has become a key pathway to promoting balanced regional economic development and narrowing the wealth gap[2]. However, significant differences remain between domestic and international research in theoretical frameworks, practical focuses, and geographical coverage. Based on bibliometric analysis and visualization techniques, this paper examines research hotspots, highly cited authors, and regional characteristics in the field of inclusive finance, offering insights for cross-regional research and policy formulation in this domain.

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2 Current Research Status and Bibliometric Methods and Data Processing

2.1 Overview of Domestic and International Research on Inclusive Finance

Table 1. Overview of Domestic and International Research on Inclusive Finance

Research Field	Domestic Research Focus	International Research Focus
Research Directions	1. Industrial structure upgrading 2. Growth of private enterprises 3. Rural revitalization 4. High-quality economic development	1. Construction and application of evaluation index systems 2. Quantitative assessment of development levels 3. Role in economic development
Representative Scholars/Institutions	Gao Xia (Rural revitalization)[3] Xing Yuecheng, Zhao Jian (Corporate financing constraints) [4] Xing Yan (Digital divide)[5]	Beck, Sarma (Index systems) Gupte (India's financial inclusion index)[8][19] International Monetary Fund, World Bank
Regional Characteristics	Focusing on China's urban-rural disparities[6], regional differences between eastern, central, and western areas, and policy-driven localized practices[7]	Cross-regional comparisons globally: Emerging markets (e.g., India, Africa) [9]versus developed countries
Methodology	Primarily empirical analysis, incorporating mediating effects and spatial econometric models[6]	Quantitative models dominate, emphasizing cross-country panel data and indicator system applications[10]

Table 1 provides an overview of the research focuses and characteristics in the field of inclusive finance both domestically and internationally.

2.2 Bibliometric Methods and Data Processing

Bibliometric analysis is a literature research method based on the principles of information science and knowledge mapping technology.[11]It constructs association networks using knowledge units as nodes to reveal the evolutionary trajectory and intrinsic structure of research fields, often employing tools like CiteSpace for knowledge visualization and keyword co-occurrence analysis. In inclusive finance research, this method systematically reviews the current state of research and identifies hot trends through processes such as literature screening, data organization, spatiotemporal distribution statistics, author-institution collaboration network analysis, and keyword theme evolution mining. [12]It provides theoretical and empirical support for field research, with its interdisciplinary application value becoming increasingly prominent in academic analysis. The data for this study primarily originates from CNKI (China National Knowledge Infrastructure), with the following specific processing steps:

Select journal sources from Peking University Core, CSSCI, and CSCD: On the CNKI search interface, limit journal sources to Peking University Core Journals, CSSCI, and CSCD to ensure the academic quality and authority of the literature. Search "inclusive finance": Enter "普惠金融" in CNKI and "Inclusive Finance" in WoS to retrieve literature. Screen, export relevant data as a database, clean and organize it, then import into Citespace for analysis.

3 Bibliometric Analysis of Inclusive Finance Literature

3.1 Publication Volume and Temporal Analysis

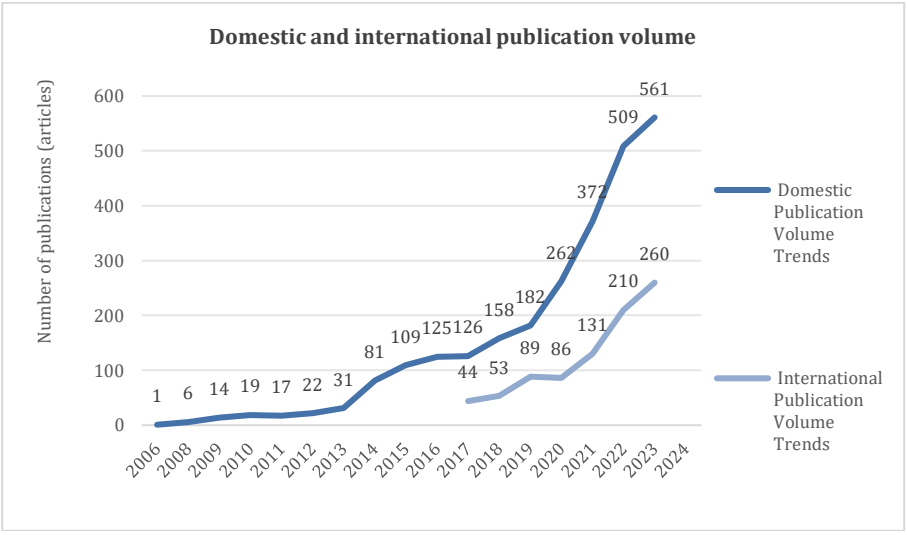

Fig. 1. Domestic and International Publication Volume Trends

As shown in Figure.1, this is a comparative chart of publication volume trends in inclusive finance research domestically and internationally. Domestic research publications began in 2006, exhibiting a three-phase growth pattern: 2006-2013 marked the initial exploratory phase, with annual publications increasing from 1 to 31, primarily focusing on rural financial reforms and microfinance studies, with early signs of policy-driven characteristics. From 2013-2019, the field entered a rapid development phase, with annual publications steadily rising to a peak of 182, driven significantly by the rise of internet finance. From 2019-2023, the field matured with high-speed yet stable growth, with annual publications consistently exceeding 200 and reaching 561 in 2023. The deep integration of digital technology and inclusive finance became the core research direction. The changes in publication volume closely align with key policy milestones in China's inclusive finance development (e.g., the Third Plenary Session of the 18th CPC Central Committee proposing deepened reforms and the introduction of the "Inclusive Finance Development Plan"), highlighting the significant role of policy in driving research.[18]

3.2 Keyword Cluster Analysis

Keyword clustering analysis is a core method in the field of text mining that employs natural language processing and machine learning algorithms (such as LLR clustering and K-means) to segment text data,[13] perform word frequency statistics, and vectorize the data, thereby identifying research topics based on keyword co-occurrence features. This technique constructs a keyword co-occurrence network, aggregating high-frequency keywords into several thematic clusters (e.g., this study generated 14 clusters with Q=0.6365 and S=0.8663), each corresponding to a specific research domain.(e.g., rural revitalization, digital finance). By highlighting the distribution of keywords within each cluster, it systematically reveals the intrinsic connections and evolutionary logic of research hotspots, providing quantitative support for identifying disciplinary frontiers, assessing research trends, and guiding cross-domain practices.[14]

Based on the keyword co-occurrence method, the LLR clustering algorithm was selected to perform clustering analysis on the keywords in the research field, generating a keyword clustering map that includes 14 clusters of varying sizes, thus yielding the final representation of keyword clustering in this field.

The average silhouette value of clustering, or the "S" value in Table 2, is an indicator for evaluating the internal similarity within clusters. The higher the S value, the stronger the similarity within the cluster. Generally, an S value above 0.5 is considered reasonable[15]. The average silhouette value for all clusters in the map is as high as 0.866, and the S values of the selected clusters are large, further confirming the reasonableness of the clustering analysis results.

As an effective summarization tool, clustering analysis can intuitively reveal the research themes in this field.[16]

Table 2. Domestic clustering analysis table

Size	Silhouette	mean (Year)	Label (LLR)
88	0.91	2015	Inclusive Finance
56	0.886	2016	Rural Revitalization
56	0.818	2020	Mediation Effect
51	0.808	2018	Digital Divide
50	0.784	2019	Financing Constraints
38	0.872	2013	Microcredit
33	0.911	2020	Digital Economy
33	0.952	2020	Digital Finance
32	0.873	2016	Financial Innovation
28	0.74	2020	Economic Growth
22	0.93	2012	Financial Exclusion

The results Table 2 show that the keyword "inclusive finance" ranks high, aligning with the search results for "inclusive finance." Yu, C., Jia, N., Li, W and other scholars [24] have conducted multi-faceted research on inclusive finance: analyzing rural financial poverty alleviation through SWOT to propose improvements, revealing regional differences in the promotion of rural income growth by inclusive finance and the role of digital inclusive finance in driving industrial upgrading; pointing out that

the digital divide affects the effect of inclusive finance in alleviating rural relative poverty and may exacerbate poverty for non-internet users[25]; confirming that digital finance eases financing constraints to boost corporate innovation, especially for SMEs and private enterprises, and that the role of inclusive finance in mitigating SME financing constraints is related to economic development and the legal environment; clarifying the relationship and differences between microfinance and inclusive finance; demonstrating the positive impact of digital finance on rural income in less-developed regions and the role of the digital economy in market matching and productivity; finding that digital finance drives consumption through payment convenience; noting that online financial innovation stimulates the economy but faces challenges; empirically proving that digital finance promotes China's economic growth, particularly in urbanized and resource-rich regions; and emphasizing that inclusive finance aims to eliminate financial exclusion for equitable growth.[23]

Based on Table 3, the LLR clustering algorithm was selected to perform cluster analysis on the research field's keywords, generating a keyword clustering map comprising 11 clusters of varying sizes. In this study, the average silhouette value for all clusters reached 0.734, and the S values of the selected clusters were high, confirming the rationality of the clustering analysis results.

Table 3. International Keyword Clustering Information Table

Size	Silhouette	mean (Year)	Label (LLR)
41	0.731	2020	inclusive leadership
41	0.684	2019	sustainable development
35	0.66	2019	household consumption
35	0.66	2020	machine learning
35	0.762	2019	econophysics
31	0.68	2019	climate change
21	0.814	2020	carbon emission
18	0.914	2017	inclusive education
17	0.84	2022	downside risk
17	0.772	2019	vulnerability
15	0.793	2022	spatial durbin model

Cluster analysis Table 3 serves as a powerful tool to visually uncover the core thematic frameworks within the research domain of inclusive finance. Internationally, studies in this field are systematically categorized into 11 distinct main clusters, each representing a unique research focus and theoretical dimension. These clusters collectively encapsulate the multifaceted nature of global inquiries into inclusive finance, ranging from leadership paradigms to technological applications and environmental sustainability. [17]

Scholars have delved into diverse areas within these clusters. For instance, research on "inclusive leadership" explores its pivotal role in driving organizational and societal equity, while studies on "sustainability" and "climate change" highlight how inclusive finance fosters green innovation and aligns financial systems with environmental goals. In the realm of "digital inclusive finance,"[20] researchers examine its impact on household consumption—particularly among low-asset and low-income groups—through mechanisms such as online wealth management platforms. Additionally,

applications of "machine learning" leverage financial inclusion indicators to predict wealth distribution patterns, while "econophysics" approaches model complex financial systems through interdisciplinary lenses.[21] Other clusters address critical issues like the spatial effects of digital finance on carbon emissions (spanning 350–400 km radii) via industrial restructuring and green credit policies, the philosophical foundations of "inclusive education" in financial literacy, and the use of "spatial Durbin models" to analyze the interplay between environmental management and inclusive growth. [22]These clusters collectively demonstrate the breadth of international research, which integrates theoretical innovation, technological tools, and policy-oriented solutions to address global challenges.The exploration of these diverse clusters not only enhances the theoretical depth of inclusive finance but also provides practical guidance for its implementation across different contexts. For example, the application of "machine learning" in predicting wealth distribution patterns offers a data-driven approach to understanding and addressing financial inequalities. Meanwhile, the investigation into the spatial effects of digital finance on carbon emissions through industrial restructuring and green credit policies highlights the potential of inclusive finance in combating climate change and promoting sustainable development. Furthermore, the integration of "inclusive education" into financial literacy programs underscores the importance of empowering individuals with the knowledge and skills necessary to participate effectively in financial systems.

3.3 Keyword Timeline and Timezone Mapping Analysis

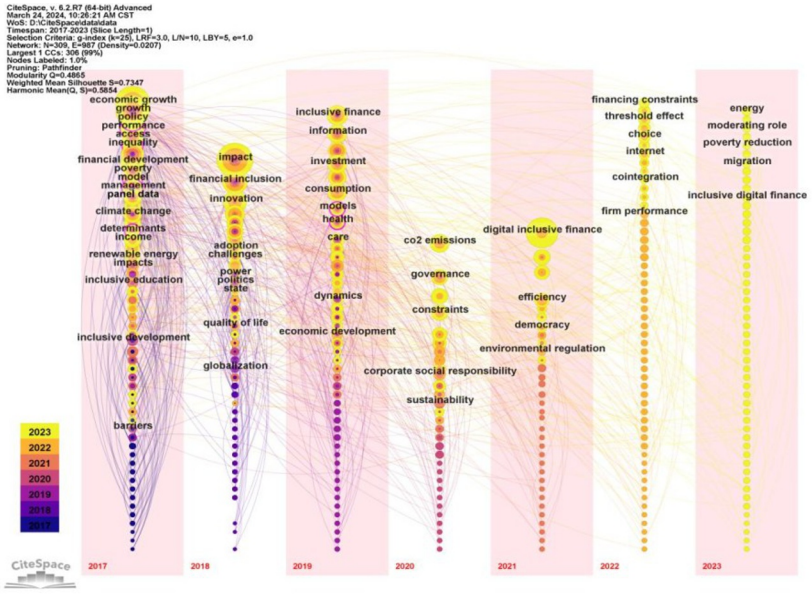

Fig. 2. Keyword Timeline and Timezone Maps

Based on keyword timeline and timezone maps Fig.2 analysis, the evolution of inclusive finance research themes in domestic and foreign contexts exhibits phased and divergent characteristics. Domestic research began in 2006, initially centered on "microcredit" and "rural finance." After 2013, "inclusive finance" and "digital finance" gradually became focal points. Since 2020, keywords like "digital rural" and "common prosperity" have emerged, reflecting a policy-driven deepening of research into digitalization and rural revitalization. Foreign research started in 2017, initially focusing on "economic growth" and "financial inclusion." After 2021, topics such as "carbon emissions" and "threshold effect" gained prominence, emphasizing sustainable development and technological model innovation.[26]

The timezone map Fig.2 reveals that domestic research themes evolve closely around policy milestones (e.g., the Third Plenum of the 18th CPC Central Committee, the Digital Rural Strategy), forming a logical chain of "policy practice → technology application → social effects." In contrast, international research has progressively expanded from foundational theories (e.g., inclusive finance assessment) to cutting-edge areas like climate finance and spatial econometrics, reflecting a trajectory of "theoretical construction → global issues → methodological innovation." While overlaps exist between domestic and international research in fields like digital transformation and financial equity, domestic studies focus more on localized practices, whereas international research emphasizes interdisciplinary theories and global governance. Future efforts could enhance cross-regional collaboration on "technology - policy - ethics" research.

4 Conclusion

This study uses bibliometric analysis to depict the current situation and trends of inclusive finance research at home and abroad. Domestic research, starting in 2006, has experienced three phases, with publications rising sharply due to policy stimuli. It focuses on themes like rural revitalization and digital finance but lacks strong author and institutional collaboration. International research, beginning in 2017, peaked in 2023, emphasizing cross - country comparisons and theoretical models on topics such as economic growth effects.

The study has several limitations. Its sample journals mainly come from Peking University Core/CSSCI, possibly ignoring peripheral disciplines. The keyword search for "inclusive finance" may miss related terms, causing incomplete coverage of emerging topics. Also, the absence of interdisciplinary integration restricts the depth of analysis.

Future research should deeply explore inclusive finance case studies across various contexts. It should investigate its relationship with sustainable development, strengthen theoretical frameworks and methodologies, focus on policies and regulations, and promote interdisciplinary research and cooperation among different sectors to boost inclusive finance application.

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