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Research progress, hotspot analysis, and development trend outlook in the field of digital inclusive finance: A visualization study based on Citespace

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Abstract: This study conducts a bibliometric analysis to delineate the intellectual structure and evolutionary trajectory of digital inclusive finance (DIF). Based on a dataset of 850 publications from the Web of Science Core Collection (2017–2025), we utilized CiteSpace 6.4.R1 to perform keyword co-occurrence, clustering, and burst detection analyses. Our findings indicate a rapidly growing body of literature, with China emerging as the leading contributor. Three primary research directions were identified: the theoretical underpinnings of DIF, its economic consequences, and its role in sustainable development. The field's focus has shifted from foundational concepts to practical impacts, such as alleviating financing constraints and fostering innovation. Currently, scholarly attention is centered on high-quality development, with "efficiency" and "entrepreneurship" being prominent buzz terms. Future research is anticipated to concentrate on "poverty" and "industry." This paper offers a systematic mapping of the DIF field, providing valuable insights into its current state and future directions. The implications are significant for scholars seeking to identify research gaps and for policymakers aiming to leverage DIF.

Keywords: *CiteSpace, Digital inclusive finance, Research frontiers, Visualization analysis.*

1. Introduction

Since its formal recognition at an international policy forum in 2016, DIF has emphasized the application of digital technologies to extend formal financial services to segments traditionally excluded from the mainstream financial system. Such services are expected to be appropriate to users' needs, provided responsibly and affordably, and remain viable for the service providers. The content of DIF spans multiple categories of financial services, encompassing transactional, savings, lending, risk-management, investment, and advisory functions that are delivered through digital infrastructures such as mobile applications, online platforms, payment cards, and electronic wallets.

Recent advances in smartphone penetration and mobile internet infrastructure have facilitated novel modes of financial service delivery, giving rise to DIF, which applies digital technologies to broaden access to financial resources. Owing to the built-in digital features and inclusive nature of the system, this form of finance capitalizes on technological progress to overcome the structural constraints that have long hindered traditional financial systems [1]. More precisely, DIF helps reduce the delivery costs of financial products while simultaneously extending service coverage and lowering access thresholds for potential users [2, 3]. It can also enhance information sharing and reduce information asymmetry as well as financial risks [4, 5]. Moreover, by leveraging digital technologies, DIF enhances the long-tail effect, making it profitable to offer targeted, small-scale financial support to a wide rural population. This provides impetus for various financial service institutions, alleviates the imbalance of service benefits, and meets the essential criteria of being accessible, cost-effective, comprehensive, and

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commercially viable, areas in which traditional inclusive finance often faces difficulty achieving balance [1].

Building on existing studies, DIF has demonstrated substantial economic effects at both macro and micro levels. At the macro scale, it enhances economic resilience [6, 7], supports sustainable growth [8, 9], and facilitates high-quality development [10] while also contributing to more efficient resource allocation and industrial upgrading [11-13]. At the household level, it eases liquidity constraints, stimulates consumption, including online purchases [14, 15], and encourages more advanced consumption patterns [16]. For firms, DIF reduces financing barriers, improves investment efficiency, and accelerates corporate transformation [17, 18]. Beyond these economic impacts, it fosters innovation and entrepreneurship: DIF contributes to expanding the scope and improving the quality of innovation, supports environmentally sustainable innovations, and increases overall innovation efficiency [19-24] while also supporting entrepreneurial activity, quality, and performance [25, 26].

As a recent innovation in the provision of financial services, DIF has gained increasing significance in economic practices and has attracted extensive scholarly attention [27]. In light of this trend, the present study employs bibliometric techniques in combination with CiteSpace visualization tools to systematically review and map the body of literature on DIF retrieved from the Web of Science Core Collection in order to investigate the following research questions:

1. How has the publication output on DIF evolved over the period from 2017 to 2025?
2. Which countries and research institutions play the most significant roles in advancing studies on this topic?
3. Which primary topics have been the focus of research in the field of DIF?
4. What key areas does existing research focus on?
5. Which key topics and evolving directions characterize research in this field?

The paper's organization is structured such that the Literature Review addresses the evolution and current landscape of DIF, while the Methodology and Data Sources section outlines the applied methods and data sources. The Descriptive Analysis section collates detailed information on the annual publication quantity of research samples, cooperative institutions, and countries during the research period. The section on Research Hotspots and Frontiers provides a detailed examination of major themes, emerging trends, and leading issues within DIF. The Discussion part assesses this study's contributions by contrasting them with prior research. Lastly, the Conclusion and Prospects section outlines the main findings, proposes directions for future studies, and highlights the study's limitations.

2. Literature Review

Viewed through the lens of financial service models and institutional evolution, the worldwide progression of DIF has experienced a transformation from microfinance to inclusive finance, and ultimately to DIF [28]. The internal logic of this evolution follows the transmission path of "insufficient financial supply, inducing financial technology innovation, stimulating inherent financial demand." Within conventional financial systems, inclusive financial services have often fallen short, leaving the funding needs of micro and small enterprises mostly unaddressed. The rise of financial technology has given birth to DIF, which, with its extensive reach, cost efficiency, operational effectiveness, and capacity to reduce information asymmetry, has significantly mitigated the limitations inherent in conventional financial supply.

Inclusive finance originated from the tradition of charity and beneficence, initially providing microfinance to impoverished and vulnerable groups through informal channels by states and religious organizations. In the 15th century, the Catholic Church in Italy established pawnshops to offer low-interest microcredit, aiming to curb usury and meet the needs of poor groups, though its impact was limited. In the 18th century, the "Loan Funds" emerged in Ireland, providing interest-free and unsecured loans to vulnerable groups and promoting on-time repayment through a "mutual supervision" mechanism [29].

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In the late 18th century, the "community savings banks" rose in Germany, providing loans to poor families and micro-enterprises based on the principle of mutual assistance, combining a charitable nature with sustainability. In the 19th century, some European countries provided micro-savings and settlement services to rural areas through postal systems, and German credit cooperatives became mainstream, later expanding to developing countries. However, many institutions struggled to achieve sustainability as their revenues failed to cover costs, leading traditional microcredit to hit a bottleneck [30].

In the 1970s, modern microcredit emerged in countries such as Bangladesh and Brazil. A typical example is the Grameen Bank, founded by Muhammad Yunus [31], which provided unsecured microloans to financially excluded vulnerable groups. It reduced costs and improved repayment rates through trust mechanisms, laying the foundation for sustainability. Its success prompted emulation in developing countries, such as the Self-Employed Women's Association Bank in India [32] and the ACCION organization in Latin America [33]. In the 1980s, microcredit projects continued to innovate. Indonesia's state-owned Bank Rakyat Indonesia (BRI) reformed the traditional model, covering costs through reasonable interest rates while maintaining high repayment rates, and successfully built a sustainable rural financial system serving a large number of clients [34].

In the 1990s, "microfinance" gained prominence, covering not only microloans but also payment, deposit, investment, asset management, and insurance services. This attracted the participation of commercial banks, expanding service providers from informal institutions to formal financial institutions [35].

In 2005, the United Nations proposed the notion of building an inclusive financial framework, aiming to reduce financial marginalization and expand service accessibility for disadvantaged populations [36]. It emphasized integrating sustainability into microcredit, adhering to both social and commercial values, and expanding service targets to all financially excluded populations, especially the poor. The Global Alliance for Financial Inclusion (GAFI) was founded in 2008, and by 2011, it had encouraged its member nations to endorse the Maya Declaration, committing to advancing inclusive finance through coordinated actions and knowledge sharing [37]. In 2010, the G20 Seoul Summit decided to establish the Global Partnership for Financial Inclusion (GPFI), constructing a global framework covering best practices, standard-setting, and funding models [38].

The 2016 G20 Summit saw the introduction of DIF through the GPFI's High-Level Principles, defining it as efforts to expand financial inclusion using digital financial tools and services [39].

3. Methodology and Data Sources

3.1. Research Methodology

Bibliometric analysis is an approach employed to measure and analyze academic publications in a quantitative manner [40], enabling the examination of the development context of specific topics and an in-depth understanding of emerging research fields. It primarily takes literature as the data source, encompassing three basic processes: collection, collation, and analysis. This study employs CiteSpace 6.4.R1 software for literature visualization analysis. Originally designed by Professor Chaomei Chen from Drexel University, CiteSpace 6.4.R1 serves as a software platform for bibliometric research and knowledge network visualization, primarily employed for the quantitative study of academic literature and for revealing and mapping new directions and transformations in scientific development [41].

This software is widely applied in fields such as academic hotspot identification, research trend analysis, disciplinary frontier detection, and cooperation network analysis, assisting researchers in extracting key information from massive literature data and generating intuitive visual maps. This study mainly adopts bibliometric and network analysis methods. Through keyword co-occurrence analysis and other approaches, it uncovers the central topics and emerging directions of study in this domain, displays the cooperation networks among countries and institutions, and recognizes key contributors or research groups. By utilizing knowledge graph visualization operations, it generates multi-dimensional knowledge graphs including timeline maps, cluster maps, and burst term maps,

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identifies emerging research trends or technological breakthroughs, and intuitively presents the development context, evolutionary trends, and future directions of the academic field [42].

3.2. Data Sources

For this research, the Web of Science Core Collection was chosen, encompassing both the SCI and SSCI citation databases. A systematic search was conducted using relevant terms: "inclusive finance" (Title) or "digital finance" (Title) or "digital inclusive finance" (Title) or "digital financial inclusion" (Title) or "inclusive digital finance" (Title). The initial search included literature published since 2015, with the retrieval cutoff date set to August 5, 2025, yielding a total of 1,231 documents. For the purpose of improving the trustworthiness and scholarly quality of the research outcomes, non-academic papers such as book reviews, news, forums, topic guidelines, and table of contents summaries were excluded, along with duplicates from online first publications and literature without authors. Finally, 850 valid documents were obtained, forming the research sample for knowledge graph analysis, which was used to comprehensively sort out and examine the development, key focus areas, and emerging directions in studies on DIF.

4. Descriptive Analysis

The main aim of scientometric studies is to systematically evaluate scientific literature, thereby using various indicators to comprehensively assess the development trajectory of a specific discipline from multiple dimensions.

The study conducted a comprehensive review and assessment of publications related to DIF, mapping the evolving trajectory of research focuses over time. It utilized the visualization analysis tool CiteSpace to effectively present detailed information on annual publication quantities, cooperative institutions, and participating countries through data visualization. By analyzing the annual number of publications, this study highlights the temporal changes in scholars' research enthusiasm. Descriptive analysis facilitates the identification of countries and institutions that have exerted significant impacts in this field, which supports the goal of recognizing leading research countries and institutions.

Overall, descriptive analysis goes beyond serving as a simple background; it is essential for achieving the study's objectives and serves as the foundation for more detailed data exploration and analysis.

4.1. Analysis of Yearly Publication Trend

The yearly publication count in academic journals reflects the level of research activity in this field and helps distinguish different research phases. This study analyzed the annual number of journal articles on DIF between 2017 and 2025. The findings are summarized in Table 1, and Figure 1 provides a visual representation of the annual publication trend.

Table 1.
Temporal Distribution of Research Papers in the Field of DIF.

Year	Number of publications
2017	1
2018	4
2019	3
2020	12
2021	33
2022	114
2023	172
2024	266
2025	245

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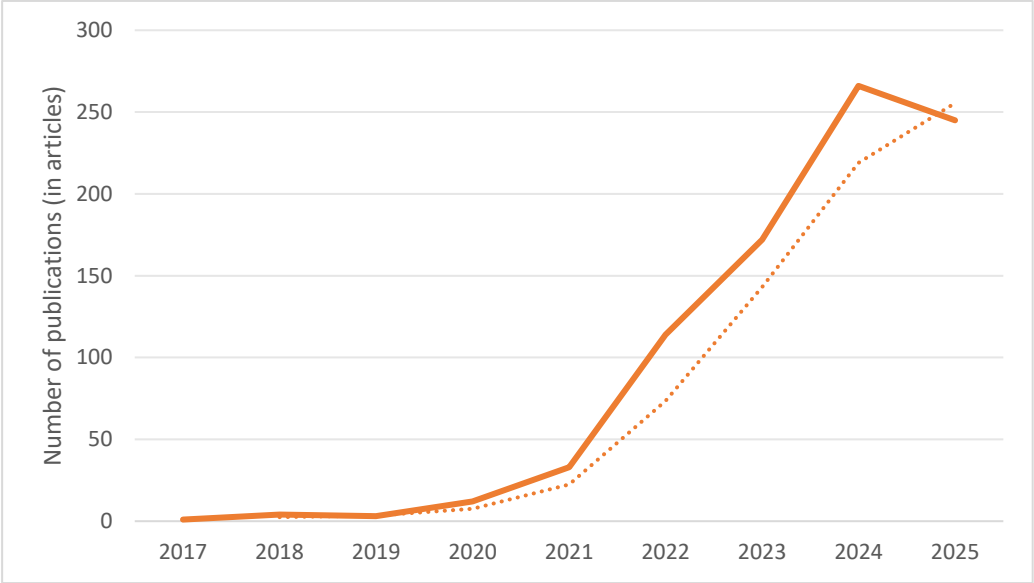

Figure 1.
Temporal Distribution of Research Papers in the Field of DIF.

From the standpoint of tracing research evolution, studies on DIF can be categorized into three major phases.

The initial stage of DIF research, spanning 2017 to 2019, saw very few annual publications, often fewer than ten, reflecting a slow pace of development. This limited output is attributable to the fact that, despite the concept and its guiding principles being proposed at the 2016 G20 Summit, it remained largely unfamiliar and underexplored in both domestic and international academia. Researchers needed time to understand, define, and establish their research paradigm, so the literature research in this stage was in the preliminary exploration phase [43].

The second phase (2020–2021) showed steady and moderate growth in publications on DIF. The surge in publications was primarily influenced by the COVID-19 outbreak, which rapidly expanded the adoption of DIF, such as online lending platforms and contactless payment systems, highlighted the importance of DIF, and stimulated further academic research in this area [44].

The third stage, from 2022 to 2025, has witnessed a rapid growth in the number of publications. The projected annual number of publications in 2025 is expected to reach 420, indicating that DIF research is in a stage of rapid development. This accelerated trend can be attributed to the gradual maturity of digital technologies. This trend shows that research and attention in this field are generally on the rise, demonstrating that DIF has attracted increasing attention and has become a crucial research area.

4.2. Distribution Characteristics of Research Institutions

Text statistics and visualization analysis were conducted on the data of 850 publications, and CiteSpace 6.4.R1 software was used to analyze the publication status of scientific research institutions. Analyzing the distribution and collaboration among research institutions helps identify future cooperation pathways and deepen exploration in this domain. The top 20 author institutions ranked by frequency in CiteSpace are summarized in Table 2.

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Table 2.
High-Yield Institutions of Research Papers in the Field of DIF.

Serial Number	Institutions	Publication Volume	Centrality	Year of First Appearance
1	Southwestern University of Finance & Economics - China	30	0.13	2020
2	Renmin University of China	26	0.13	2022
3	Zhongnan University of Economics & Law	24	0.17	2018
4	Nanjing University of Finance & Economics	23	0.17	2020
5	Wuhan University	23	0.21	2022
6	Shanghai University of Finance & Economics	19	0.21	2018
7	University of International Business & Economics	18	0.09	2022
8	Liaoning University	16	0.02	2021
9	Peking University	16	0.07	2023
10	Sichuan University	16	0.11	2022
11	Capital University of Economics & Business	15	0.09	2020
12	Jilin University	14	0.07	2020
13	Central University of Finance & Economics	14	0.1	2021
14	Hunan University	13	0.02	2021
15	Central South University	13	0.03	2022
16	Shenzhen University	12	0.02	2022
17	Zhejiang University of Finance & Economics	12	0.02	2023
18	Shandong University	12	0.08	2021
19	Chongqing University	12	0.08	2022
20	Chinese Academy of Social Sciences	12	0.11	2022

Data indicate that the top 20 universities contribute approximately 40% of all publications, suggesting a high concentration of research efforts in the field of DIF. Table 2 displays the top 20 universities.

Betweenness centrality reflects how crucial a node is within a network structure. According to Table 2, Wuhan University, Shanghai University of Finance and Economics, Zhongnan University of Economics and Law, Nanjing University of Finance and Economics, Southwestern University of Finance and Economics, and Renmin University of China are recognized as six leading research institutions, whose collaboration intensity greatly surpasses that of other universities.

CiteSpace software can be used to present the institutions and their cooperation networks in a specific field. In the CiteSpace interface, select "Institution" as the node type; after running the software, the cooperation network map of relevant research institutions is generated. Figure 2 shows the institution and cooperation network map within the domain of DIF.

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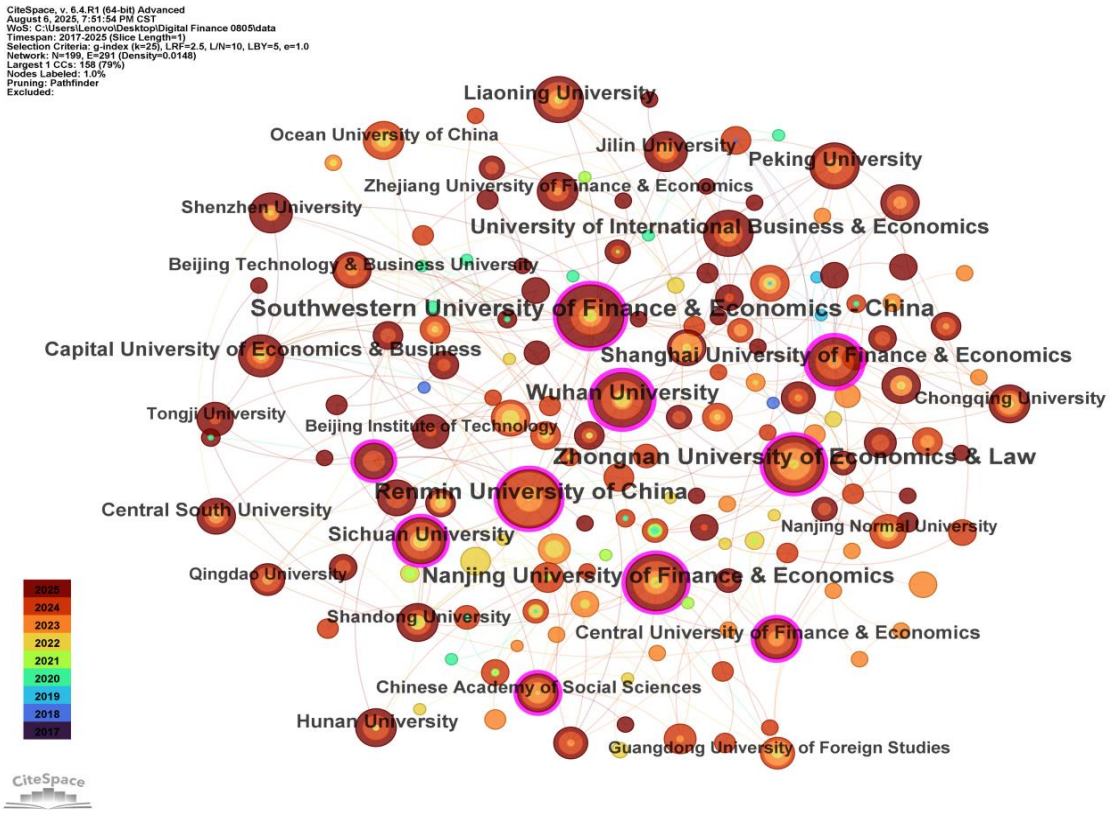

Figure 2.
Co-occurrence Knowledge Graph of High-Yield Institutions for Research Papers in the Field of DIF.

In the figure, each node denotes a research institution, with its size corresponding to the number of papers it has published. The connecting lines illustrate collaboration between institutions, and their thickness represents the frequency of co-authored publications. The network consists of 199 nodes and 291 links, yielding a density of 0.0148. Overall, collaborations between research institutions in DIF are relatively limited, resulting in a low network density. In particular, the institutions involved in international cooperation are also relatively scattered, with a lack of mutual exchanges. In summary, the cooperation between scientific research organizations within DIF is low in closeness and intensity, and a strong cooperative network structure has not yet been formed.

4.3. Country Cooperation Analysis

In this era of globalization, country cooperation analysis plays a crucial role in understanding the research landscape of DIF, which directly supports the objective of this study: to examine the cooperation among different countries. This study further evaluated the literature publication status of different countries in this field, as shown in Table 3.

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Table 3.
Top 9 countries by frequency and centrality.

Serial Number	Countries	Frequency	Countries	Centrality
1	PEOPLE'S R CHINA	783	PEOPLE'S R CHINA	0.91
2	USA	31	FRANCE	0.2
3	ENGLAND	30	SOUTH AFRICA	0.16
4	AUSTRALIA	18	SAUDI ARABIA	0.14
5	MALAYSIA	17	AUSTRALIA	0.12
6	FRANCE	13	ENGLAND	0.11
7	PAKISTAN	13	PAKISTAN	0.11
8	INDIA	12	GHANA	0.11
9	SAUDI ARABIA	11	JAPAN	0.06

Table 3 presents the nine countries with the highest publication counts. China leads with 783 papers, followed by the United States (31), the United Kingdom (30), Australia (18), Malaysia (17), France (13), Pakistan (13), and India (12). These figures suggest that research on DIF is concentrated in these nations, with China contributing 74% of the total publications, highlighting its dominant position in international research.

Cross-country analysis allows for quantifying the geographic distribution of publications. Analyzing the co-authorship network at the country level enables the identification of nations that dominate research production and collaboration, those positioned at the research frontier, and others that are gradually becoming key participants. The patterns of international cooperation in DIF are illustrated in Figure 3.

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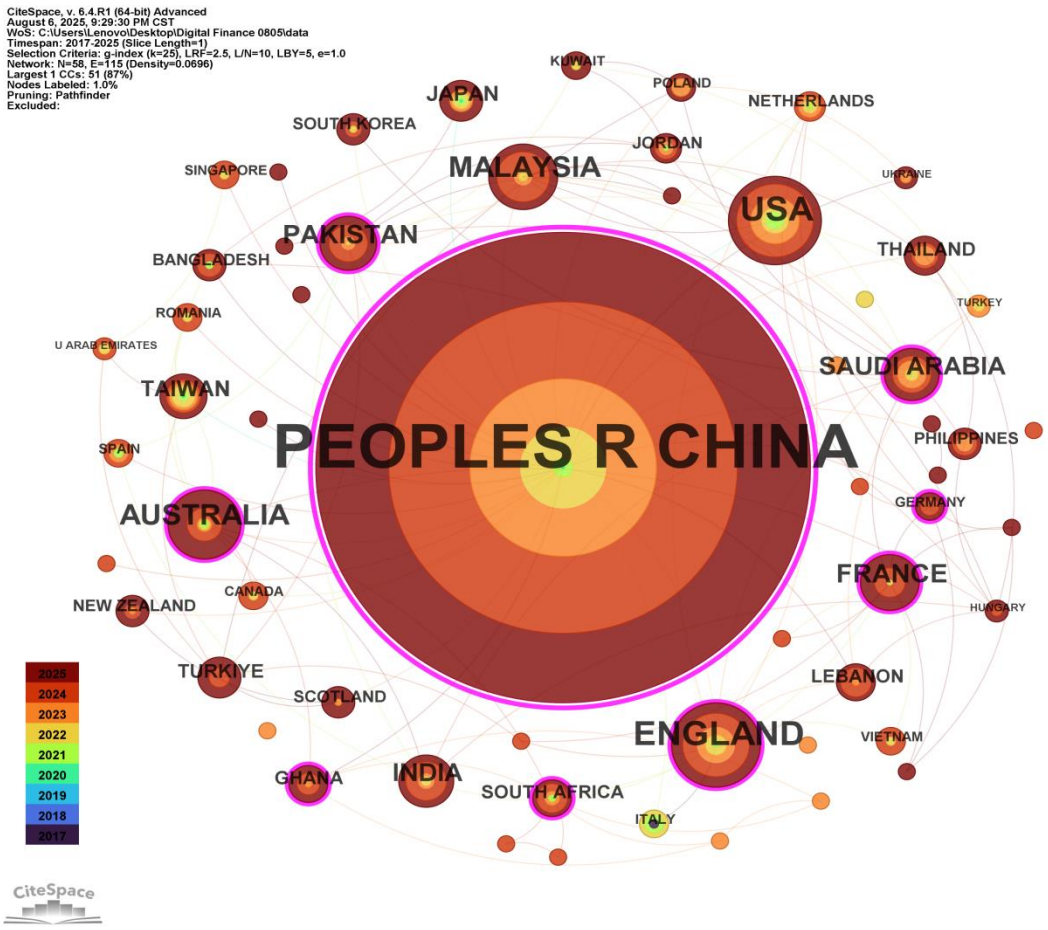

Figure 3.
Country Cooperation Map of Research Papers in the Field of DIF.

Figure 3 displays a network of 58 nodes and 115 connections, with a density of 0.0696, highlighting the main contributing countries. The measure of betweenness centrality reflects the relative influence of each node within the network. China's centrality stands in a class of its own, followed by France, South Africa, Saudi Arabia, Australia, and the United Kingdom, which are in leading positions in international cooperation.

5. Research Hotspots and Frontiers

Research hotspots denote topics within a particular field that receive significant attention across numerous publications over a given time frame. Keywords typically serve as concise representations of the central themes of these articles, and their frequency in the literature of a field can be used to reveal research hotspots. Therefore, the knowledge graph constructed through keyword co-occurrence can effectively reflect the research hotspots in this field [42].

5.1. Keyword Co-occurrence Analysis

By mapping keyword co-occurrence, it is possible to identify the central themes and focus areas explored in a specific research domain [45]. As shown in Figure 4, a keyword co-occurrence network has been constructed in this study, which displays the current research hotspots.

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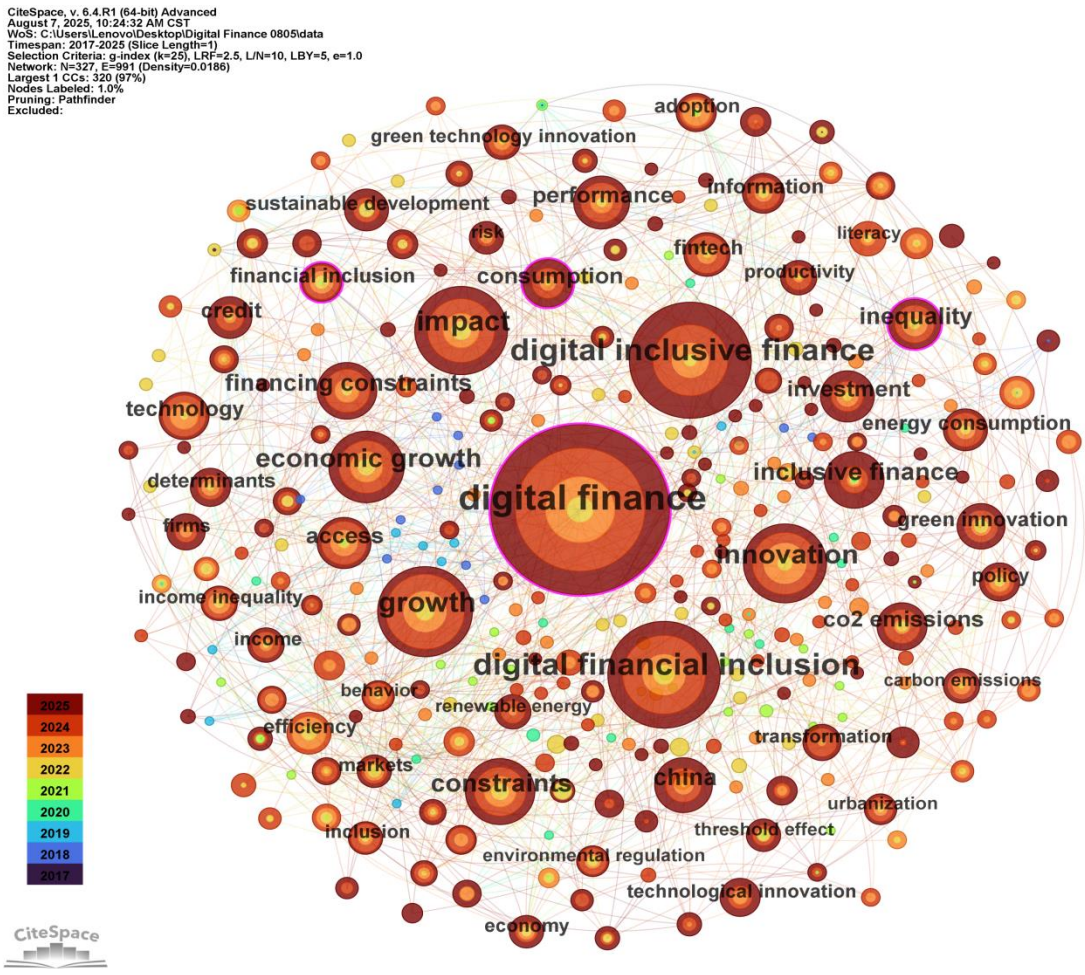

Figure 4.
Keyword Co-occurrence Knowledge Graph of Research in the Field of DIF.

Within the network graph, node size reflects how frequently each keyword occurs. Thicker links indicate stronger co-occurrence relationships, and node colors denote the year the keyword first emerged. The graph contains 327 nodes and 991 connections, with a network density of 0.0186, indicating that the keyword co-occurrence relationships in DIF research are relatively complex, while the overall co-occurrence density is relatively low.

The figure indicates that, between 2017 and 2025, "digital finance" had the highest co-occurrence frequency, appearing 363 times, followed by "digital inclusive finance" (173), "digital financial inclusion" (149), and "growth" (106). The top 20 keywords by co-occurrence frequency also include "impact" (105), "innovation" (81), "economic growth" (69), "constraints" (60), "inclusive finance" (47), "China" (46), "financing constraints" (44), "inequality" (41), "access" (39), "performance" (38), "investment" (38), "CO_2 emissions" (34), "consumption" (34), "technology" (31), "credit" (31), and "fintech" (28). The research themes represented by these keywords constitute the core content of DIF research from 2017 to 2025 and also serve as the main path nodes in the knowledge network of this field.

In the CiteSpace software, frequency and betweenness centrality of keywords in co-occurrence analysis are two core indicators, which are used to quantify the popularity of keywords and their hub roles in the network, respectively. The frequency of a keyword indicates how many times it appears across the literature collection, and betweenness centrality evaluates a node's importance within the

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network structure. Together, these two metrics form the core of keyword co-occurrence analysis: frequency reflects the prominence of research topics, and betweenness centrality traces the flow of knowledge.

Table 4.
Top 20 Keywords by Frequency and Their Betweenness Centrality.

Serial Number	Keywords	Count	Centrality	Mean (year)
1	Digital finance	363	0.12	2018
2	Digital inclusive finance	173	0.04	2020
3	Digital financial inclusion	149	0.06	2020
4	Growth	106	0.02	2021
5	Impact	105	0.04	2020
6	Innovation	81	0.08	2020
7	Economic growth	69	0.01	2021
8	Constraints	60	0.06	2020
9	Inclusive finance	47	0.05	2018
10	China	46	0.06	2020
11	Financing constraints	44	0	2022
12	Inequality	41	0.17	2017
13	Access	39	0.05	2019
14	Performance	38	0	2022
15	Investment	38	0.07	2021
16	Co2 emissions	34	0.03	2021
17	Consumption	34	0.11	2019
18	Technology	31	0.02	2022
19	Credit	31	0.06	2019
20	Fintech	28	0	2022

In CiteSpace, centrality quantifies the importance of a keyword as a "bridge" or "hub" in the entire co-occurrence network. A higher value indicates a stronger connecting role between different research themes. Meanwhile, nodes whose centrality exceeds 0.1 can be regarded as high-centrality nodes [46, 47]. Keywords with centrality exceeding 0.1 are typically key hubs. As shown in Table 4, the keywords whose centrality exceeds 0.1 are "inequality" (0.17), "digital finance" (0.12), and "consumption" (0.11), indicating that they frequently appear in different research branches and have established connections with multiple themes.

5.1.1. Inequality (0.17)

Leyshon and Thrift [48] were the first to identify the phenomenon of financial inequality. To cut costs and boost profits, certain financial institutions shut branches in disadvantaged or isolated regions, leaving some communities underserved and excluding vulnerable populations. In 2005, the United Nations put forward the idea of inclusive finance as a means to reduce financial inequality [36]. With the rapid development of digital technology, inclusive finance has ushered in new opportunities. At the 2016 G20 Summit, the concept of DIF was introduced, accompanied by the G20 High-Level Principles for Digital Financial Inclusion, which seek to reduce financial disparities using digital technologies [39].

Beyond addressing financial inequality, DIF contributes to reducing income and wealth disparities [49, 50], particularly the urban–rural income gap [51, 52]. It further contributes to relieving the funding difficulties encountered by SMEs [53, 54]. Moreover, DIF supports gender equality and fosters broader inclusive development [55].

In the literature network, "inequality" is often connected with themes such as "poverty alleviation" and "income distribution," serving as an interdisciplinary "bridge".

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5.1.2. Digital Finance (0.12)

In practical terms, digital finance refers to financial services accessible through smartphones, computers, internet-based channels, or cards tied to secure digital payment infrastructures [56]. Similarly, McKinsey describes it as financial services delivered via mobile devices, web platforms, or payment cards [57]. Additionally, the range of digital finance encompasses innovative products, supporting software, and new mechanisms for customer engagement [58].

Digital finance is a collection of technical tools and innovative models, while DIF represents the primary social benefits generated by the application of these technologies and serves as the core research objective. As a carrier for achieving inclusiveness, digital finance functions as a pivotal link that integrates different technological tools (e.g., big data, blockchain), practical use cases (e.g., rural development, SME financing), and key outcomes (e.g., reducing financial exclusion, supporting entrepreneurship).

5.1.3. Consumption (0.11)

DIF can affect both the spending power of residents and the composition of their consumption. By alleviating residents' liquidity constraints, it promotes household consumption [59] and, in particular, boosts consumers' online shopping [14]; it can also drive consumption upgrading [16].

In the network, it connects multiple themes such as "household financial behavior," "economic growth," and "poverty reduction." Consumption operates both as a central channel through which DIF shapes economic and societal outcomes and as a vital metric for evaluating the effectiveness of financial inclusiveness. Therefore, it bridges the gap between macroeconomic research and microbehavioral research.

5.2. Keyword Clustering Analysis

By examining keyword co-occurrence, the literature highlights the terms that appear most often, representing the central themes studied in DIF research. Nonetheless, examining high-frequency keywords in isolation is insufficient to capture the full scope of research themes in this field. Cluster analysis, on the other hand, provides a clear visualization of prominent research topics and the grouping of keywords [60]. Using the keyword co-occurrence knowledge graph, the "Keywords Source of Labels" was employed for clustering. After processing the results, the resulting keyword clustering map was produced, as presented in Figure 5.

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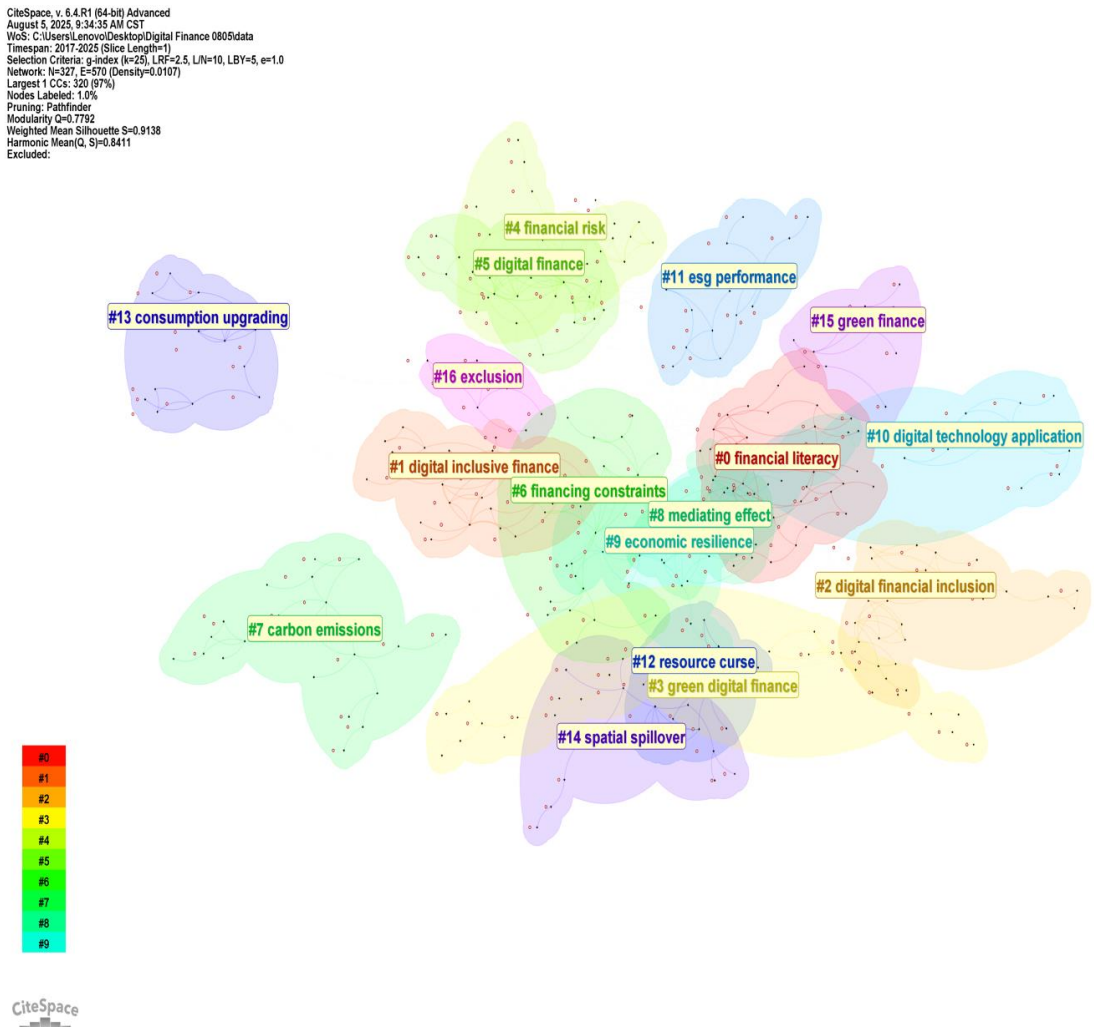

Figure 5.
Keyword Co-occurrence Clustering Map of Research in the Field of DIF.

Finally, 17 valid clustering categories were obtained by clustering keywords from 850 literature, which indicate the main research themes within DIF. These 17 keyword clusters include financial literacy, digital inclusive finance, digital financial inclusion, green digital finance, financial risk, digital finance, etc. Regarding statistical significance, the clustering exhibits a modularity Q value of 0.7792, exceeding the 0.3 threshold, which indicates meaningful clustering. At the same time, the average silhouette S value reaches 0.9138, above the 0.7 benchmark, confirming the effectiveness of the clustering [61]. The detailed clustering topics, along with the associated high-frequency keywords, are presented in Table 5.

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Table 5.
Composition and Clustering Topics in DIF Research.

Cluster ID	Cluster identifier	Size	Silhouette	Mean (Year)	Top Terms
0	Financial literacy	31	0.824	2021	Financial literacy; household finance; inclusive digital finance.
1	Digital inclusive finance	26	0.914	2020	Digital inclusive finance; digital finance; inclusive finance.
2	Digital financial inclusion	24	0.985	2022	Digital financial inclusion; digital finance; common prosperity.
3	Green digital finance	24	0.961	2023	Green digital finance, income inequality, and energy transition.
4	Financial risk	23	0.874	2022	Financial risk, digital finance development, and financial constraints.
5	Digital finance	22	0.969	2019	Digital finance; digital inclusive finance; digital financial inclusion.
6	Financing constraints	22	0.839	2022	Financing constraints, green technology innovation, and total factor productivity.
7	Carbon emissions	21	0.98	2022	Carbon emissions, technological innovation, and energy consumption.
8	Mediating effect	20	0.87	2021	Digital inclusive finance; mediating effect; moderated mediating effect.
9	Economic resilience	18	0.978	2021	Economic resilience, financial efficiency, and digital economy.
10	Digital technology application	16	0.832	2023	Digital technology application; entrepreneurial activity; online shopping.
11	ESG performance	15	0.95	2023	ESG performance, green innovation, and financial performance.
12	Resource curse	15	0.935	2023	Resource curse; financial constraint; environmental technology
13	Consumption upgrading	15	0.967	2021	Consumption upgrading; household consumption; overspending
14	Spatial spillover	11	0.899	2022	Spatial spillover; poverty alleviation; spatial effect.
15	Green finance	10	0.879	2023	Green finance, energy poverty, and CO_2 emission.
16	Exclusion	7	0.886	2019	Exclusion; digital finance; low-carbon economy.

As shown in Table 5, clustering analysis was conducted on the keywords of existing literature, and 17 valid clusters were finally obtained: financial literacy, digital inclusive finance, digital financial inclusion, green digital finance, financial risk, digital finance, financing constraints, carbon emissions, moderating effect, economic resilience, digital technology application, ESG performance, energy crisis, consumption upgrading, spatial spillover effect, green finance, and exclusion. These cluster terms can be categorized into three types:

The first category is theoretical foundations and implementation conditions, which includes the cluster terms: financial literacy, digital inclusive finance, digital financial inclusion, digital finance, digital technology application, and exclusion. Research in this category mainly focuses on the definition, characteristics, and development foundations of DIF. For example, financial literacy is considered a key prerequisite for residents to make effective use of digital inclusive financial services [62]. Challenges related to digital financial inclusion and financial exclusion, on the other hand, highlight disparities in access to financial resources across different groups [63]. In addition, the adoption of technologies, including big data, AI, and blockchain, acts as a central catalyst for the development of DIF, concurrently reducing operational expenses and boosting service efficiency [64].

The second category is economic effects and mechanisms of action, which includes the cluster terms: financial risk, financing constraints, consumption upgrading, economic resilience, moderating effect, and spatial spillover effect. A substantial body of research indicates that DIF helps reduce firms' financing

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difficulties [54], mitigate financial risks [4], and facilitate the transformation of household consumption patterns [65]. It also enhances overall economic system resilience [6, 42]. Moreover, studies examining spatial spillovers and moderating factors reveal that the effects of DIF extend beyond local regions, generating broader economic impacts through interregional connections [52].

The third category pertains to green and sustainable development, encompassing cluster terms such as green digital finance, carbon emissions, ESG performance, energy issues, and green finance. In light of the "dual carbon" targets and the broader sustainable development agenda, scholars have increasingly examined the environmental and social spillover effects of DIF. Research in this area has emphasized the advancement of green finance and green digital finance, along with their role in mitigating carbon emissions [66-68]. Additionally, topics including corporate ESG performance and energy challenges have been integrated into the research framework [69], demonstrating how DIF can support companies in fulfilling social responsibilities, optimizing the use of resources, and strengthening management effectiveness.

5.3. Keyword Co-Occurrence Time-Zone View Analysis

The Keyword Co-occurrence Time-Zone View is a visual map in CiteSpace that integrates the temporal dimension into co-occurrence analysis. It provides an intuitive perspective on the dynamic evolution of a research field, serving to display the first appearance time of keywords in the field and their evolving co-occurrence relationships. Node dimensions indicate how often each keyword appears across the dataset; higher frequency indicates more sustained attention to the keyword in the field. The horizontal axis of the time-zone view represents time: the distribution of the years when keywords first appeared can reveal the origin and diffusion trends of research themes; the connections between nodes show the co-occurrence relationships among keywords in different years, indicating the continuous influence of early research on later themes. After running the software, the corresponding keyword time-zone view was obtained, as shown in Figure 6.

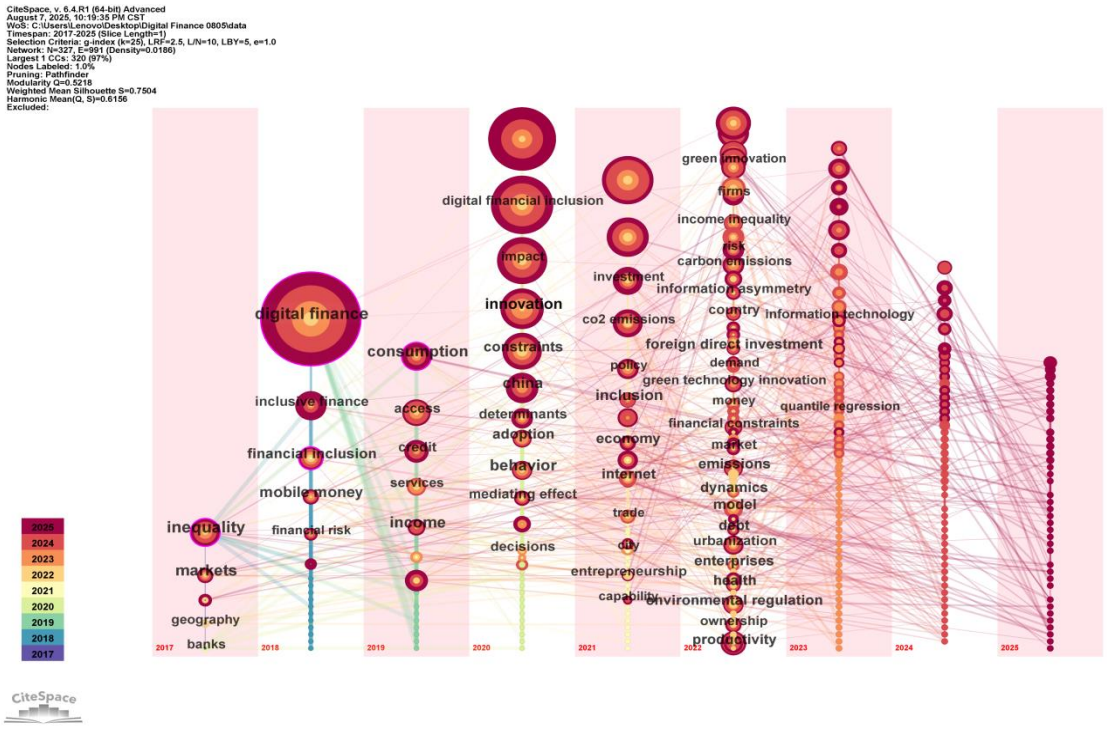

Figure 6.
Keyword Co-occurrence Time-Zone View of Research in the Field of DIF.

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As shown in Figure 6, the research context and hotspots of DIF have undergone the following changes:

From 2017 to 2019, this period marked the initial exploration stage. The main keywords emerging in this stage were basic conceptual terms, such as "digital finance," "inclusive finance," and "inequality." This indicates that research in this stage focused more on the characteristics: relying on digital technology, it can break geographical boundaries, alleviate financial exclusion, reduce information asymmetry and financial risks, and solve the problem of unsustainable development faced by traditional inclusive finance. Meanwhile, preliminary exploration was conducted on the economic effects, such as alleviating inequality and promoting consumption.

From 2020 to 2021, this period witnessed a moderate growth stage of research related to DIF, with more refined research themes. The sudden outbreak of the COVID-19 pandemic at the end of 2019 accelerated the popularization of DIF. The main keywords emerging in this stage included "digital financial inclusion," "constraints," "innovation," and "economic growth." These keywords underscore the significant contribution of DIF to easing financing constraints, fostering innovation and entrepreneurship, and stimulating economic growth, thereby enabling more detailed and advanced research in this field.

Between 2022 and 2025, studies on DIF expanded rapidly. The most prominent keywords included "green innovation," "income inequality," and "productivity." This indicates that research in this area has increasingly focused on fostering sustainable economic and social development, striving to achieve more equitable income distribution and enhance corporate productivity, thus facilitating DIF in promoting sustainable and robust economic development.

5.4. Keyword Burst Analysis

Keyword burst analysis refers to, within a specific time frame, detecting whether a keyword exhibits "explosive growth" (i.e., burstiness) by statistically analyzing the temporal changes in the occurrence frequency of keywords in the literature. The significance of keyword bursts is measured by burst strength; a higher value indicates greater research attention. The life cycle of research hotspots is located based on the duration of bursts, thereby revealing the dynamic evolution trend of burst keywords and analyzing the development and transformation of research hotspots. In the Burstness module, the parameter γ was set to 0.6, and the "Sort by the beginning year of burst" method was adopted. The corresponding keyword burst map was obtained, as shown in Figure 7. Among the 18 burst keywords mentioned below, "efficiency" (Strength) ranks first, followed by "Inclusive finance" and "Entrepreneurship."

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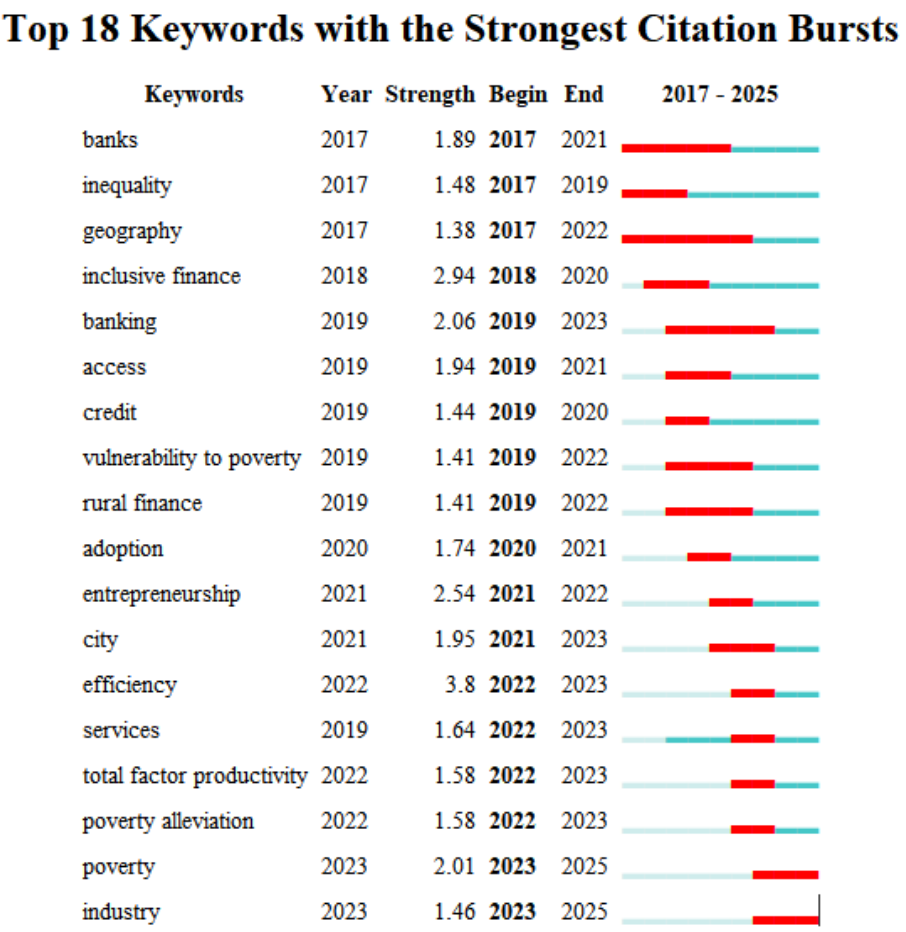

Figure 7.
Keyword Burst Map of Research in the Field of DIF.

1. "Efficiency" (Strength) ranks first. The efficiency of DIF is key to addressing the shortcomings of conventional inclusive financial systems. To serve micro and small groups and remote areas, traditional inclusive finance needs to set up additional outlets and hire more staff, leading to low operational efficiency and high marginal costs. Digital technologies enable inclusive finance to deliver financial services more efficiently [1]. For instance, mobile payments replace physical outlets to reduce transaction costs; big data-based risk control shortens credit approval from "days" to "seconds"; and algorithmic matching reduces capital misallocation.

Efficiency represents a central theme in DIF research. During the initial phase of its development, studies primarily concentrated on expanding access to financial services. However, with the development of digital technologies, as most people have gained access to financial services, the research focus has shifted to service quality and sustainability, and efficiency is a key indicator for measuring quality and sustainability. Existing studies not only focus on the improvement of financial service efficiency by DIF but also conduct research at the macro level: DIF can also enhance investment efficiency [17], innovation efficiency [70], production efficiency [71], economic development efficiency [72], and ecological efficiency [73].

2. "Inclusive finance (Strength) ranks second. Inclusive finance and financial exclusion are a pair of relative concepts. When studying bank competitive behaviors, Leyshon and Thrift [48] found that some financial institutions closed their branches in poor and remote areas out of cost and profit

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considerations, leading to the lack of financial services in specific communities, and defined this phenomenon as "financial exclusion." Financial exclusion is often associated with material poverty and social exclusion; it deprives people of choices and opportunities, and exacerbates social inequality [74]. In addition, financial exclusion can hinder the accumulation of human and physical capital among groups lacking financial services, restrict economic growth, and trigger economic problems such as income inequality [75].

DIF can alleviate financial exclusion from multiple dimensions: breaking geographical restrictions through online services to mitigate access exclusion [59] reducing financial prices with low-cost services to ease price exclusion [76] leveraging technologies such as big data to mine user data for credit evaluation, thereby improving condition exclusion [4] focusing on the "long-tail market" ignored by traditional finance to relieve market exclusion [77] and driven by the development of rural e-commerce, it can stimulate diverse financial needs, thereby alleviating self-exclusion [78].

Therefore, DIF fundamentally depends on digital technologies to reduce financial exclusion and promote inclusive finance, which also explains why "inclusive finance" ranks second among the burst keywords in DIF research.

3. "Entrepreneurship (Strength) ranks third. Entrepreneurship is a core driver of economic growth [79, 80]. It not only stimulates market innovation and facilitates the emergence of new products and services but also effectively alleviates social employment pressure [25]. In addition, by forcing inefficient enterprises to transform and upgrade, and stimulating the vitality of market competition, entrepreneurship forms a positive cycle that drives high-quality economic development [81].

Entrepreneurship usually requires financial capital support. However, households with insufficient funds often face financial exclusion when seeking financing from traditional financial institutions, which not only increases the difficulty of entrepreneurship but may even completely exclude potential entrepreneurs [25]. DIF has the capacity to reduce financial exclusion, and it can not only promote the scale and quantity of entrepreneurship [3, 42, 82] but also improve entrepreneurial performance [26].

Clearly, DIF plays an important role in fostering entrepreneurial activities, which helps explain why “entrepreneurship” ranks third among the burst keywords in this research area.

Looking ahead, "poverty" and "industry" are expected to become key research priorities in the next phase of DIF studies.

1. Regarding "poverty": Eliminating poverty worldwide is a core goal of the United Nations’ 2030 Sustainable Development Goals (SDGs), and DIF functions as a crucial instrument in achieving it.

First, DIF helps reduce the poverty of disadvantaged groups in accessing financial services. Based on this, it can mitigate economic poverty. On one hand, DIF utilizes digital technologies to reduce the costs of financial transactions and credit, which in itself reduces the economic burden on residents in poverty-stricken areas. On the other hand, impoverished groups can also obtain returns by purchasing financial products. Second, by mitigating information gaps and alleviating financing limitations, DIF promotes entrepreneurship and employment among impoverished groups, thereby increasing their income. Third, e-commerce developed based on DIF markets the characteristic products of poverty-stricken areas nationwide, boosting the income of local impoverished groups; it additionally promotes entrepreneurial activities, helping raise earnings for residents in economically disadvantaged regions. Furthermore, by alleviating cash flow constraints and streamlining payment procedures for households, DIF can stimulate residents’ online spending, which in turn lowers the living expenses of disadvantaged populations and enhances their standard of living [83]. Additionally, it contributes to a more efficient allocation of social financial resources and supports inclusive economic development, resulting in broader societal benefits that enhance the welfare of disadvantaged groups and contribute to poverty reduction.

China completed its poverty alleviation task as early as 2020, in which DIF played a significant role [47, 84, 85]. Similar studies in countries such as India, Indonesia, and research in African countries have also shown that DIF can contribute to reducing poverty [86-88].

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As the UN's 2030 SDGs deadline approaches, and considering issues such as relative poverty and the potential for poverty recurrence, DIF is likely to emerge as a key area of investigation in studies focused on long-term poverty mitigation.

2. Regarding "industry": First, DIF exerts multifaceted impacts across primary, secondary, and tertiary industries. In the agricultural sector, DIF directly stimulates rural development through its broad accessibility, diverse financial offerings, and cost-efficient operations, while indirectly promoting industrial integration by strengthening local economies. Enhanced capital availability, technological innovation, and labor return to rural areas further support the comprehensive advancement of rural industries [89] with empirical studies showing improvements in agricultural productivity [90], high-standard agricultural development [91], and environmentally sustainable practices [66]. In manufacturing, DIF facilitates firms' transitions toward environmentally sustainable operations [92], encourages digital technology innovation [93], and contributes to the upgrading of industries along the global value chain [94]. Within the service sector, DIF enhances labor productivity [71], generates additional employment opportunities [95], and supports high-quality sectoral development [18].

In addition, a number of investigations have analyzed DIF's influence on industrial transformation and development [77, 96, 97] with further studies addressing issues related to regional industrial growth and the formation of industrial networks. Specifically, DIF helps reduce funding constraints for SMEs while fostering entrepreneurial activities and supporting innovative development, thereby driving the upgrading and development of local industries [54]. On the other hand, studies have also emphasized its role in enhancing the resilience and efficiency of industrial chains, especially against the backdrop of regional economic transformation and response to external shocks [98]. This indicates that the discussion on "industry" is no longer limited to the development of individual industries but has extended to broader dimensions such as coordinated regional development and the sustainability of industrial systems.

6. Discussion

Centering on the core research questions proposed, this study systematically sorted out the prominent themes, evolutionary timeline, and emerging trends within DIF studies using CiteSpace 6.4.R1 software. This holds significant implications for advancing theoretical understanding and practical exploration in this field.

After an initial embryonic stage, there has been a significant rise in the quantity of research articles. In particular, the outbreak of COVID-19 hastened the popularization of DIF, highlighted the importance of inclusive finance, and stimulated literature research in this field [44]. In recent years, the number of publications has grown rapidly, indicating that DIF research is undergoing a period of rapid growth. This accelerated trend can be attributed to the gradual maturity of digital technologies.

Stable and solid cooperative relationships have not been formed between collaborative institutions and countries. Among them, China leads significantly in research hotspots. The reason lies in that this field is highly driven by microdata, but core data are mostly concentrated in leading enterprises and cooperative institutions. Due to privacy and compliance considerations, data sharing mechanisms are still imperfect, which virtually increases the threshold for in-depth collaboration [56]. Meanwhile, the development paths of different countries vary significantly. China has formed a unique research agenda based on its local market and policies, and the particularity of its topics has, to some extent, weakened the commonality of cross-border research [99]. In addition, as the field remains at an initial stage of growth, cooperation is mostly based on short-term projects, and an institutionalized and regular collaborative network is still being cultivated [100]. Relying on its significant financial inclusion gap, unique giant technology platform ecosystem, and strong national policy support, China has spawned a large number of cutting-edge studies based on local practices. This indicates that there is great potential for international cooperation in this field in the future, but it is necessary to find more universal theoretical frameworks and cooperation entry points.

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The analysis shows that studies on DIF primarily examine issues such as inequality, consumption patterns, and innovation, aligning with the findings of earlier research [14, 16, 39, 50-52, 59, 89, 93, 101].

A review of the timeline of DIF reveals that its historical development is characterized by a shift in research focus: from the differentiation of basic concepts and exploration of models in the early stage, to the verification of its microeconomic effects in stimulating innovation and alleviating financing constraints, and further to the advancement of high-quality development mechanisms centered on supporting sustainable development, promoting the optimization of income distribution, and improving total factor productivity.

Compared with previous studies, Li and Zhang [44], this study not only provides an in-depth examination of the research topics in DIF through clustering analysis but also conducts a categorical analysis of these themes. It condenses 17 clustering themes into three types of research topics: the underlying theories and practical prerequisites of DIF, its economic impacts and the ways it operates, and its contribution to environmentally sustainable development, offering scholars a more integrated and complete view of the research in this field.

Our examination of burst keywords and temporal mapping in DIF indicates that poverty reduction and industrial development will be central to future investigations. Continued exploration in this field is anticipated to play an essential role in advancing poverty reduction, promoting social equity, reducing the urban–rural income divide, stimulating business innovation, encouraging consumption upgrading, and accelerating industrial restructuring and advancement. Collectively, these studies help scholars identify key focus areas and emerging trends in DIF, providing theoretical guidance and practical value that foster more systematic and sustained academic inquiry in the domain.

7. Conclusions and Limitations

7.1. Research Conclusions

This study takes 850 literature related to DIF research published in the Web of Science Core Collection from 2017 to 2025 as the research object. By using CiteSpace 6.4.R1 software, it constructs knowledge graphs and conducts multi-level analyses, drawing the following conclusions:

7.1.1. Analysis of Yearly Publication Trend

From the perspective of identifying research trends, the development of DIF research can be divided into three distinct phases.

Phase I (2017–2019): Early exploration stage. During this period, only a few studies appeared each year, showing slow progress. As the idea of DIF had just emerged from the 2016 G20 Summit and was still new to both domestic and global academia, research activity remained limited. Researchers needed time to understand, define it, and establish its research paradigm. Therefore, the literature research in this phase belonged to the preliminary exploration stage.

Second phase (2020–2021): Moderate growth stage. During this stage, publications on DIF exhibited steady and moderate growth. The surge in related studies largely stems from the acceleration of DIF adoption during the COVID-19 pandemic, which highlighted the growing importance of financial inclusion and stimulated academic interest in this domain.

Third phase (2022–2025): Rapid development stage. During this period, the number of published studies expanded sharply, reflecting that research on DIF has entered a phase of rapid expansion. This accelerated trend can be attributed to the gradual maturity of digital technologies. The trend shows that research and attention in this field are generally on the rise, suggesting that DIF has gained growing scholarly interest and emerged as a key area of research.

This addresses Research Question 1.

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7.1.2. Distribution of Collaborative Institutions and Countries

Collaborative research institutions. The connections between academic institutions dedicated to DIF are relatively sparse, with low network density. In particular, internationally collaborative institutions are scattered, and communication between them is insufficient. In summary, the research institutions in this field have low collaboration intensity and weak cooperation ties, and no strong collaborative network structure has been formed yet.

National distribution. The top 9 countries publishing the highest number of papers are China (783), the United States (31), the United Kingdom (30), Australia (18), Malaysia (17), France (13), Pakistan (13), and India (12). This indicates that these countries focus on studies on DIF. Among them, China accounts for 74% of the total publications of all countries, demonstrating that China leads significantly in international research. China also ranks uniquely in terms of centrality, followed by France, South Africa, Saudi Arabia, Australia, and the United Kingdom, which take leading positions in international cooperation.

This addresses Research Question 2.

7.1.3. Analysis of Main Research Focuses

The analysis of keyword co-occurrence reveals that frequently used terms mainly fall into two categories: one relates to the technological dimension, including digital finance, while the other pertains to the economic impacts of DIF, such as easing financing difficulties, stimulating innovation, enhancing investment performance, encouraging consumption, reducing inequality, and fostering overall economic expansion. The keywords with high centrality are inequality (0.17), digital finance (0.12), and consumption (0.11).

This addresses Research Question 3.

7.1.4. (4) Analysis of Main Research Fields

In the keyword clustering analysis, 17 valid clustering categories were obtained, which can be divided into three types: The theoretical basis and implementation requirements of DIF include financial literacy, digital financial services, and digital technology application; its economic impacts cover consumption upgrading, economic resilience, and spatial spillovers; and it also contributes to green and sustainable development, encompassing concepts such as green digital finance, carbon emissions, and green finance.

This addresses Research Question 4.

7.1.5. Analysis of Research Hotspots and Trends

In the early stage, research focused on basic access and distribution issues represented by keywords such as "bank," "geography," and "inequality." Subsequently, it shifted to the study of core mechanisms and effectiveness, with keywords including "inclusive finance," "credit," and "entrepreneurship." Recent research frontiers have further expanded to macro impacts such as "poverty" and "industry," and have been deeply integrated with environmental issues such as "carbon emissions" and "green technology innovation." This presents a complete context: from addressing accessibility, to improving efficiency, and then to serving inclusive green development.

This addresses Research Question 5.

7.2. Limitations

1. This study adopts a bibliometric approach, which provides a broad overview of the hotspots and emerging trends in the field of DIF. However, there remains room for more in-depth analysis of specific themes, especially when compared with other review methods.
2. Relying on a single database for literature retrieval limits the scope of the study. Limiting the dataset to the Web of Science Core Collection and omitting co-citation analysis could reduce the overall breadth of the research outcomes. To achieve more robust and insightful conclusions,

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subsequent studies might integrate additional sources such as Scopus or CNKI to diversify data inputs and strengthen analytical depth.

3. The research time span is not sufficiently long. Literature was retrieved using synonymous terms related to "digital inclusive finance." Since scholars only began conducting research on this theme after the concept of "digital inclusive finance" was introduced in 2016, the time span of the retrieved literature is 2017–2025. The collation of research and contexts related to this topic before 2017 is not the focus of this study. However, supplementing relevant literature for subsequent research will enable a clearer and more complete understanding of DIF.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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References

[1] M. Li, "Research on the impact of digital inclusive finance on the urban-rural income gap," Doctoral Dissertation, Nanjing Normal University, 2021.

[2] Y. Feng, M. Meng, and G. Li, "Impact of digital finance on the asset allocation of small-and medium-sized enterprises in China: Mediating role of financing constraints," *Journal of Innovation & Knowledge*, vol. 8, no. 3, p. 100405, 2023. https://doi.org/10.1016/j.jik.2023.100405

[3] X. Sun and X. Xie, "How does digital finance promote entrepreneurship? The roles of traditional financial institutions and BigTech firms," *Pacific-Basin Finance Journal*, vol. 85, p. 102316, 2024. https://doi.org/10.1016/j.pacfin.2024.102316

[4] W. Jun and X. Q. Ran, "Dynamics in digital finance and its impact on SME financing," *Heliyon*, vol. 10, no. 9, p. e30586, 2024. https://doi.org/10.1016/j.heliyon.2024.e30586

[5] F. Shao, Z. Jiao, T. Jin, and X. Zhu, "Bridging the gap: Digital finance's role in addressing maturity mismatch in investment and financing for agricultural enterprises," *Finance Research Letters*, vol. 64, p. 105415, 2024. https://doi.org/10.1016/j.frl.2024.105415

[6] X. Shang and Q. Liu, "Digital inclusive finance and regional economic resilience: Evidence from China's 283 Cities over 2011-2021," *Finance Research Letters*, vol. 69, p. 105953, 2024. https://doi.org/10.1016/j.frl.2024.105953

[7] L. Yang, H. A. A. Al-Jaifi, and K. Y. M. Lee, "A dynamic bibliometric analysis of financial inclusion and happiness with CiteSpace," *Cogent Economics & Finance*, vol. 12, no. 1, p. 2414236, 2024. https://doi.org/10.1080/23322039.2024.2414236

[8] Y. Sun and X. Tang, "The impact of digital inclusive finance on sustainable economic growth in China," *Finance Research Letters*, vol. 50, p. 103234, 2022. https://doi.org/10.1016/j.frl.2022.103234

[9] Z. Gao, Y. Zhu, Y. Wei, and Y. Hao, "The green circuit: Tracing digital inclusive finance's role in sustainable urban development," *Research in International Business and Finance*, vol. 76, p. 102809, 2025. https://doi.org/10.1016/j.ribaf.2025.102809

[10] E. Li, Y. Tang, Y. Zhang, and J. Yu, "Mechanism research on digital inclusive finance promoting high-quality economic development: Evidence from China," *Heliyon*, vol. 10, no. 3, p. e25671, 2024. https://doi.org/10.1016/j.heliyon.2024.e25671

[11] H. Wang and J. Guo, "Impacts of digital inclusive finance on CO2 emissions from a spatial perspective: Evidence from 272 cities in China," *Journal of Cleaner Production*, vol. 355, p. 131618, 2022. https://doi.org/10.1016/j.jclepro.2022.131618

[12] D. Tang, Z. Zhao, W. Shen, J. Zhang, Y. Kong, and V. Boamah, "Research on the impact of digital finance on the industrial structure upgrading of the Yangtze River economic belt from the perspective of R&D innovation," *Sustainability*, vol. 15, no. 1, p. 425, 2022. https://doi.org/10.3390/su15010425

[13] R. Zhanbayev and W. Bu, "How does digital finance affect industrial transformation?," *Journal of Information Economics*, vol. 1, no. 1, pp. 18–30, 2023. https://doi.org/10.58567/jie01010002

[14] A. Jiang, "The impact of digital finance on online shopping," *Finance Research Letters*, vol. 56, p. 104089, 2023. https://doi.org/10.1016/j.frl.2023.104089

[15] M. Zhu, Y. Wang, M. Wei, and Z. Cai, "How does digital finance affect consumer online shopping: A comprehensive analysis based on econometric model," *Finance Research Letters*, vol. 54, p. 103734, 2023. https://doi.org/10.1016/j.frl.2023.103734

[16] D. Hu, C. Zhai, and S. Zhao, "Does digital finance promote household consumption upgrading? An analysis based on data from the China family panel studies," *Economic Modelling*, vol. 125, p. 106377, 2023. https://doi.org/10.1016/j.econmod.2023.106377

[17] Y. Lin, X. Yan, and X. Yang, "Digital finance and enterprise investment efficiency in China," *International Review of Financial Analysis*, vol. 90, p. 102929, 2023. https://doi.org/10.1016/j.irfa.2023.102929

[18] C.-C. Lee, M. Tang, and C.-C. Lee, "Reaping digital dividends: Digital inclusive finance and high-quality development of enterprises in China," *Telecommunications Policy*, vol. 47, no. 2, p. 102484, 2023. https://doi.org/10.1016/j.telpol.2022.102484

[19] M. Xiong, W. Li, B. T. S. Xian, and A. Yang, "Digital inclusive finance and enterprise innovation—Empirical evidence from Chinese listed companies," *Journal of Innovation & Knowledge*, vol. 8, no. 1, p. 100321, 2023. https://doi.org/10.1016/j.jik.2023.100321

[20] Y. Fang and Z. Liu, "Can digital finance enhance enterprise research and development innovation? The mediating role of dual consumption behavior transformation," *Finance Research Letters*, vol. 71, p. 106458, 2025. https://doi.org/10.1016/j.frl.2024.106458

[21] S. Feng, R. Zhang, and G. Li, "Environmental decentralization, digital finance and green technology innovation," *Structural Change and Economic Dynamics*, vol. 61, pp. 70-83, 2022. https://doi.org/10.1016/j.strueco.2022.02.008

[22] T. Kong, R. Sun, G. Sun, and Y. Song, "Effects of digital finance on green innovation considering information asymmetry: An empirical study based on Chinese listed firms," *Emerging Markets Finance and Trade*, vol. 58, no. 15, pp. 4399-4411, 2022. https://doi.org/10.1080/1540496X.2022.2083953

[23] W. Wang, "Digital finance and firm green innovation: The role of media and executives," *Finance Research Letters*, vol. 74, p. 106794, 2025. https://doi.org/10.1016/j.frl.2025.106794

[24] X. Zhu, H. Wu, and Q. Deng, "Quantity or quality: Novel insights into the impact of digital finance on innovation," *Finance Research Letters*, vol. 65, p. 105603, 2024. https://doi.org/10.1016/j.frl.2024.105603

[25] Z. Chen, J. Zhang, and X. Liu, "Encouraging entrepreneurship through digital inclusive finance," *Finance Research Letters*, vol. 74, p. 106715, 2025. https://doi.org/10.1016/j.frl.2024.106715

[26] J. Wu and L. Wu, "Impacts of digital inclusive finance on household entrepreneurship," *Finance Research Letters*, vol. 56, p. 104114, 2023. https://doi.org/10.1016/j.frl.2023.104114

[27] Y. Du, Q. Wang, and J. Zhou, "How does digital inclusive finance affect economic resilience: Evidence from 285 cities in China," *International Review of Financial Analysis*, vol. 88, p. 102709, 2023. https://doi.org/10.1016/j.irfa.2023.102709

[28] B. Hu and X. Cheng, "Fintech, digital inclusive finance and national financial competitiveness," *Wuhan University Journal (Philosophy & Social Science)*, vol. 73, no. 3, pp. 130–141, 2020.

[29] A. Hollis and A. Sweetman, "Microcredit in prefamine Ireland," *Explorations in Economic History*, vol. 35, no. 4, pp. 347-380, 1998. https://doi.org/10.1006/exeh.1998.0702

[30] A. Hollis and A. Sweetman, "Microcredit: What can we learn from the past?," *World Development*, vol. 26, no. 10, pp. 1875-1891, 1998. https://doi.org/10.1016/S0305-750X(98)00082-5

[31] P. S. Jain, "Managing credit for the rural poor: lessons from the Grameen Bank," *World Development*, vol. 24, no. 1, pp. 79-89, 1996. https://doi.org/10.1016/0305-750X(95)00116-T

[32] R. Datta, "From development to empowerment: the self-employed women's association in India," *International Journal of Politics, Culture, and Society*, vol. 16, pp. 351-368, 2003. https://doi.org/10.1023/A:1022352227601

[33] K. Doshi, *Sustainability and impact of microfinance institutions: A case study of ACCION San Diego. In Positive design and appreciative construction: From sustainable development to sustainable value.* Bingley, UK: Emerald Group Publishing Limited, 2010.

[34] H. D. Seibel and M. Ozaki, *Restructuring of state-owned financial institutions: Lessons from Bank Rakyat Indonesia.* Manila, Philippines: Asian Development Bank, 2009.

[35] R. Cull, A. Demirgüç-Kunt, and J. Morduch, "Microfinance meets the market," *Journal of Economic Perspectives*, vol. 23, no. 1, pp. 167-192, 2009. https://doi.org/10.1257/jep.23.1.167

[36] United Nations Secretary-General, *Observance of the international year of microcredit, 2005: Report of the secretary-general.* New York: United Nations, 2006.

[37] A. Hannig, M. Leifheit, and L. Lázaro Rüther, *The alliance for financial inclusion: Bringing smart policies to life. In L. L. Rüther, C. Ayala Martínez, & U. Müller (Eds.), Global funds and networks: Narrowing the gap between global policies and national implementation.* Baden-Baden, Germany: Nomos Verlagsgesellschaft mbH & Co. KG, 2014.

[38] B. Timmermann and P. Gmehling, "Financial inclusion and the G20 agenda," presented at the The International Statistical Institute Regional Statistics Conference, 2017.

[39] J. Li and B. Li, "Digital inclusive finance and urban innovation: Evidence from China," *Review of Development Economics*, vol. 26, no. 2, pp. 1010-1034, 2022. https://doi.org/10.1111/rode.12846

[40] O. Öztürk, R. Kocaman, and D. K. Kanbach, "How to design bibliometric research: An overview and a framework proposal," *Review of Managerial Science*, vol. 18, pp. 3333-3361, 2024. https://doi.org/10.1007/s11846-024-00738-0
[41] C. Sun, G. Jiang, and J. Zhang, "An analysis of hotspots, subject structure, and emerging trends in digital governance research," *Sage Open*, vol. 14, no. 3, p. 21582440241268756, 2024. https://doi.org/10.1177/21582440241268756
[42] Y. Yang, Z. Lin, Z. Xu, and S. Liu, "The impact of digital finance on regional economic resilience," *Pacific-Basin Finance Journal*, vol. 85, p. 102353, 2024. https://doi.org/10.1016/j.pacfin.2024.102353
[43] M.-J. Gallego-Losada, A. Montero-Navarro, E. García-Abajo, and R. Gallego-Losada, "Digital financial inclusion. Visualizing the academic literature," *Research in International Business and Finance*, vol. 64, p. 101862, 2023. https://doi.org/10.1016/j.ribaf.2022.101862
[44] Q. Li and X. Zhang, "Digital finance development in China: A scientometric review," *Heliyon*, vol. 10, no. 16, p. e36107, 2024. https://doi.org/10.1016/j.heliyon.2024.e36107
[45] Z. Cheng, Y. Xie, and H. Wen, "Visualization analysis of research on climate innovation on CiteSpace," *Frontiers in Environmental Science*, vol. 10, p. 1025128, 2022. https://doi.org/10.3389/fenvs.2022.1025128
[46] J. Torres-Pruñonosa, M. A. Plaza-Navas, F. Díez-Martín, and A. Beltran-Cangrós, "The intellectual structure of social and sustainable public procurement research: A co-citation analysis," *Sustainability*, vol. 13, no. 2, p. 774, 2021. https://doi.org/10.3390/su13020774
[47] Y. Yang, G. Qu, L. Hua, and L. Wu, "Knowledge mapping visualization analysis of research on blockchain in management and economics," *Sustainability*, vol. 14, no. 22, p. 14971, 2022. https://doi.org/10.3390/su142214971
[48] A. Leyshon and N. Thrift, "The restructuring of the UK financial services industry in the 1990s: A reversal of fortune?," *Journal of Rural Studies*, vol. 9, no. 3, pp. 223-241, 1993. https://doi.org/10.1016/0743-0167(93)90068-U
[49] L. Liu and L. Guo, "Digital financial inclusion, income inequality, and vulnerability to relative poverty," *Social Indicators Research*, vol. 170, pp. 1155-1181, 2023. https://doi.org/10.1007/s11205-023-03245-z
[50] M. Suhrab, P. Chen, and A. Ullah, "Digital financial inclusion and income inequality nexus: Can technology innovation and infrastructure development help in achieving sustainable development goals?," *Technology in Society*, vol. 76, p. 102411, 2024. https://doi.org/10.1016/j.techsoc.2023.102411
[51] H. Zhao, X. Zheng, and L. Yang, "Does digital inclusive finance narrow the urban-rural income gap through primary distribution and redistribution?," *Sustainability*, vol. 14, no. 4, p. 2120, 2022. https://doi.org/10.3390/su14042120
[52] P. Liu, Y. Zhang, and S. Zhou, "Has digital financial inclusion narrowed the urban–rural income gap? A study of the spatial influence mechanism based on data from China," *Sustainability*, vol. 15, no. 4, p. 3548, 2023. https://doi.org/10.3390/su15043548
[53] C. Li, Y. Wang, Z. Zhou, Z. Wang, and A. Mardani, "Digital finance and enterprise financing constraints: Structural characteristics and mechanism identification," *Journal of Business Research*, vol. 165, p. 114074, 2023. https://doi.org/10.1016/j.jbusres.2023.114074
[54] Y. Bu, X. Du, Y. Wang, S. Liu, M. Tang, and H. Li, "Digital inclusive finance: A lever for SME financing?," *International Review of Financial Analysis*, vol. 93, p. 103115, 2024. https://doi.org/10.1016/j.irfa.2024.103115
[55] D. Le Quoc, "The relationship between digital financial inclusion, gender inequality, and economic growth: Dynamics from financial development," *Journal of Business and Socio-Economic Development*, vol. 4, no. 4, pp. 370-388, 2024. https://doi.org/10.1108/JBSED-12-2023-0101
[56] P. K. Ozili, "Impact of digital finance on financial inclusion and stability," *Borsa Istanbul Review*, vol. 18, no. 4, pp. 329-340, 2018. https://doi.org/10.1016/j.bir.2017.12.003
[57] J. Manyika, S. Lund, M. Singer, O. White, and C. Berry, *Digital finance for all: Powering inclusive growth in emerging economies*. USA: McKinsey Global Institute, 2016.
[58] P. Gomber, J.-A. Koch, and M. Siering, "Digital Finance and FinTech: Current research and future research directions," *Journal of Business Economics*, vol. 87, pp. 537-580, 2017. https://doi.org/10.1007/s11573-017-0852-x
[59] J. Li, Y. Wu, and J. J. Xiao, "The impact of digital finance on household consumption: Evidence from China," *Economic Modelling*, vol. 86, pp. 317-326, 2020. https://doi.org/10.1016/j.econmod.2019.09.027
[60] M. Singhania and G. Chadha, "Thirty years of sustainability reporting research: A scientometric analysis," *Environmental Science and Pollution Research*, vol. 30, pp. 102047-102082, 2023. https://doi.org/10.1007/s11356-023-29452-2
[61] Y. Chen, C. M. Chen, Z. Y. Liu, Z. G. Hu, and X. W. Wang, "The methodology function of CiteSpace mapping knowledge domains," *Studies in Science of Science*, vol. 33, no. 2, pp. 242–253, 2015.
[62] L. Zhang, J.-k. Liu, Z.-h. Li, J.-y. Yu, and C. J. Ding, "Inclusive or fraudulent: Digital inclusive finance and urban–rural income gap," *Asia-Pacific Financial Markets*, vol. 84, pp. 821–854, 2024. https://doi.org/10.1007/s10690-024-09472-9
[63] X. Ji, K. Wang, H. Xu, and M. Li, "Has digital financial inclusion narrowed the urban-rural income gap: The role of entrepreneurship in China," *Sustainability*, vol. 13, no. 15, p. 8292, 2021. https://doi.org/10.3390/su13158292
[64] Y. Xiao, Y. Zhang, C. Wen, Q. He, and X. Xia, "Does digital financial inclusion narrow the urban-rural income gap? Evidence from prefecture-level cities in China," *Transformations in Business & Economics*, vol. 21, no. 2, pp. 792–815, 2022.

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[65] C. Yu, N. Jia, W. Li, and R. Wu, "Digital inclusive finance and rural consumption structure–evidence from Peking University digital inclusive financial index and China household finance survey," *China Agricultural Economic Review*, vol. 14, no. 1, pp. 165-183, 2022. https://doi.org/10.1108/CAER-10-2020-0255

[66] J. Guo, L. Chen, and X. Kang, "Digital inclusive finance and agricultural green development in China: A panel analysis (2013–2022)," *Finance Research Letters*, vol. 69, p. 106173, 2024. https://doi.org/10.1016/j.frl.2024.106173

[67] R. Shi, L. Yao, M. Zhao, and Z. Yan, "Low-carbon production performance of agricultural green technological innovation: From multiple innovation subject perspective," *Environmental Impact Assessment Review*, vol. 105, p. 107424, 2024. https://doi.org/10.1016/j.eiar.2024.107424

[68] F. Zhang, F. Wang, R. Hao, and L. Wu, "Agricultural science and technology innovation, spatial spillover and agricultural green development—taking 30 provinces in China as the research object," *Applied Sciences*, vol. 12, no. 2, p. 845, 2022. https://doi.org/10.3390/app12020845

[69] M. A. A. Ansari, M. Sajid, S. N. Khan, V. M. Antohi, C. Fortea, and M. L. Zlati, "Unveiling the effect of renewable energy and financial inclusion towards sustainable environment: Does interaction of digital finance and institutional quality matter?," *Sustainable Futures*, vol. 7, p. 100196, 2024. https://doi.org/10.1016/j.sftr.2024.100196

[70] H. Wang and F. Liu, "Digital finance and enterprise innovation efficiency: Evidence from China," *Finance Research Letters*, vol. 59, p. 104709, 2024. https://doi.org/10.1016/j.frl.2023.104709

[71] D. Wu and Y. Chen, "Digital inclusive finance development and labor productivity: Based on a capital-deepening perspective," *Sustainability*, vol. 15, no. 12, p. 9243, 2023. https://doi.org/10.3390/su15129243

[72] Z. Guan and J. Han, "Evaluating digital financial inclusion's impact on regional economic efficiency in China," *International Review of Economics & Finance*, vol. 102, p. 104325, 2025. https://doi.org/10.1016/j.iref.2025.104325

[73] Y. Zhang, R. Cui, X. Wei, and T. Chen, "How digital financial inclusion enhances agroecological efficiency: Impact effects and mechanism tests," *International Review of Economics & Finance*, vol. 97, p. 103755, 2025. https://doi.org/10.1016/j.iref.2024.103755

[74] N. Mylonidis, M. Chletsos, and V. Barbagianni, "Financial exclusion in the USA: Looking beyond demographics," *Journal of Financial Stability*, vol. 40, pp. 144-158, 2019. https://doi.org/10.1016/j.jfs.2017.09.004

[75] P. S. Koku, "Financial exclusion of the poor: A literature review," *International Journal of Bank Marketing*, vol. 33, no. 5, pp. 654-668, 2015. https://doi.org/10.1108/IJBM-09-2014-0134

[76] J. Wang, "Digital inclusive finance and rural revitalization," *Finance Research Letters*, vol. 57, p. 104157, 2023. https://doi.org/10.1016/j.frl.2023.104157

[77] W. Zhou, X. Zhang, and X. Wu, "Digital inclusive finance, industrial structure, and economic growth: An empirical analysis of Beijing-Tianjin-Hebei region in China," *Plos One*, vol. 19, no. 3, p. e0299206, 2024. https://doi.org/10.1371/journal.pone.0299206

[78] Q. Fu and Y. Huang, "Digital finance's heterogeneous effects on rural financial demand: Evidence from China household finance survey and inclusive digital finance index," *Journal of Financial Research*, vol. 11, pp. 68-84, 2018.

[79] N. Ghazy, H. Ghoneim, and G. Lang, "Entrepreneurship, productivity and digitalization: Evidence from the EU," *Technology in Society*, vol. 70, p. 102052, 2022. https://doi.org/10.1016/j.techsoc.2022.102052

[80] I. Munyo and L. Veiga, "Entrepreneurship and economic growth," *Journal of the Knowledge Economy*, vol. 15, no. 1, pp. 319-336, 2024. https://doi.org/10.1007/s13132-022-01032-8

[81] M. Tahir and U. Burki, "Entrepreneurship and economic growth: Evidence from the emerging BRICS economies," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 9, no. 2, p. 100088, 2023. https://doi.org/10.1016/j.joitmc.2023.100088

[82] W. Yu, L. Wang, X. Liu, W. Xie, and M. Zhang, "Can digital inclusive finance promote high-quality rural entrepreneurship? A county-level analysis from China," *Finance Research Letters*, vol. 67, p. 105820, 2024. https://doi.org/10.1016/j.frl.2024.105820

[83] M. Xiong, W. Li, B. S. X. Teo, and J. Othman, "Can China's digital inclusive finance alleviate rural poverty? An empirical analysis from the perspective of regional economic development and an income gap," *Sustainability*, vol. 14, no. 24, p. 16984, 2022. https://doi.org/10.3390/su142416984

[84] J. Tang, J. Gong, and W. Ma, "Narrowing urban–rural income gap in China: The role of the targeted poverty alleviation program," *Economic Analysis and Policy*, vol. 75, pp. 74-90, 2022. https://doi.org/10.1016/j.eap.2022.05.004

[85] Y. Zhou, Z. Liu, H. Wang, and G. Cheng, "Targeted poverty alleviation narrowed China's urban-rural income gap: A theoretical and empirical analysis," *Applied Geography*, vol. 157, p. 103000, 2023. https://doi.org/10.1016/j.apgeog.2023.103000

[86] M. N. Islam, M. S. S. Ornob, and M. M. Hossain, "Digital financial services in marginalised communities: Pathways to poverty reduction and economic empowerment," *Information Technology for Development*, vol. 31, no. 4, pp. 1645-1671, 2025. https://doi.org/10.1080/02681102.2025.2521272

[87] M. Tarique and Z. Malik, "Asymmetric impact of digital finance on poverty and income inequality using NARDL approach: Evidence from Indonesia," *Journal of the Knowledge Economy*, pp. 1-26, 2025. https://doi.org/10.1007/s13132-024-02454-2

[88] G. Osuma, "The impact of financial inclusion on poverty reduction and economic growth in Sub-Saharan Africa: A comparative study of digital financial services," *Social Sciences & Humanities Open*, vol. 11, p. 101263, 2025. https://doi.org/10.1016/j.ssaho.2024.101263
[89] W. Li, L. Zhang, M. Pu, and H. Wang, "Digital inclusive finance, rural revitalization and rural consumption," *PloS one*, vol. 20, no. 1, p. e0310064, 2025. https://doi.org/10.1371/journal.pone.0310064
[90] X. Hong, Q. Chen, and N. Wang, "The impact of digital inclusive finance on the agricultural factor mismatch of agriculture-related enterprises," *Finance Research Letters*, vol. 59, p. 104774, 2024. https://doi.org/10.1016/j.frl.2023.104774
[91] J. Feng and Y. Wang, "Does digital inclusive finance promote agricultural development?A test based on threshold and spillover effects," *Finance Research Letters*, vol. 69, p. 106104, 2024. https://doi.org/10.1016/j.frl.2024.106104
[92] H. Fu, C. Zheng, and P. Yang, "Digital inclusive finance and green transformation of manufacturing enterprises: Empirical analysis based on the dual perspectives of demand and supply," *Technological Forecasting and Social Change*, vol. 200, p. 123152, 2024. https://doi.org/10.1016/j.techfore.2023.123152
[93] H. Ling and X. Ling, "The impact of digital inclusive finance on enterprise digital technology innovation: Empirical evidence from the Chinese manufacturing industry," *Humanities and Social Sciences Communications*, vol. 12, no. 1, pp. 1-19, 2025. https://doi.org/10.1057/s41599-025-04699-x
[94] Y. Cai, L. Liang, Y. Zhang, L. Qi, and C. Wang, "Does digital inclusive finance promote industrial global value chain upgrading? Evidence from china's advanced manufacturing industry," *Finance Research Letters*, p. 107640, 2025. https://doi.org/10.1016/j.frl.2025.107640
[95] X. Huang and F. Lan, "Nonlinear dynamics and mechanisms of digital inclusive finance on county-level public services in China: Threshold and mediation analyses," *PLoS One*, vol. 20, no. 7, p. e0327771, 2025. https://doi.org/10.1371/journal.pone.0327771
[96] H. Shen, M. Qin, T. Li, X. Zhang, and Y. Zhao, "Digital finance and industrial structure upgrading: Evidence from Chinese counties," *International Review of Financial Analysis*, vol. 95, p. 103442, 2024. https://doi.org/10.1016/j.irfa.2024.103442
[97] Z. Gao, "Enhancing industry evolution: The role of digital inclusive finance in optimizing and upgrading the industrial structure," *Journal of World Economy*, vol. 3, no. 2, pp. 33-44, 2024.
[98] L. Hu, F. Chen, and R. Zhao, "Does digital inclusive finance increase industry chain resilience in China?," *Sustainability*, vol. 16, no. 14, p. 6028, 2024. https://doi.org/10.3390/su16146028
[99] T. F. Dapp, "Digital finance: A question of access deutsche bank research," 2019. https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000488978/Digital_Finance%3A_A_question_of_access.PDF
[100] C. Leong, B. Tan, X. Xiao, and F. T. C. Tan, "A bibliometric analysis of digital finance research: Trends, collaborations, and themes," *Journal of Financial Services Marketing*, 2022.
[101] N. Yu and Y. Wang, "Can digital inclusive finance narrow the Chinese urban–rural income gap? The perspective of the regional urban–rural income structure," *Sustainability*, vol. 13, no. 11, p. 6427, 2021. https://doi.org/10.3390/su13116427