

# International Conference on Business and Economics - Hellenic Open University

Vol 5, No 1 (2025)

Proceedings of the ICBE-HOU 2025



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### To cite this article:

Trigkas, S. J., Toudas, K., & Boufounou, P. (2026). The Role of Fintech in Regional Economic Development: A Bibliometric Analysis. *International Conference on Business and Economics - Hellenic Open University*, 5(1). Retrieved from <https://eproceedings.epublishing.ekt.gr/index.php/ICBE-HOU/article/view/9746>

# The Role of Fintech in Regional Economic Development: A Bibliometric Analysis

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## Abstract

In this article we provide a bibliometric analysis that studies the relationship between financial technology (fintech) and regional economic development (RED) research from 2000 to 2025. Building upon the database of Bibliometrix literature (Biblioshiny), we present a map of how the intellectual architecture, themes, and collaboration patterns among researchers in this interdisciplinary field are developed at various levels and are using data of 474 peer-reviewed papers. We assume that analysis suggests a fast growing research space with an annual growth rate of 46.95%, in part, due to increased scholarly inquiry especially following 2019. We have 1,318 authors contribution with 102 sources and a significant international collaboration (23.42%), with the average of 3 co-authors per document. Our results suggest that what is unique is that fintech goes in both directions, both in terms of an equalizing edge of well developed and underserved areas, and in terms of a catalyst for the emergence of new kinds of spatial inequalities. We also draw the conclusion that there are also some research gaps in understanding long-term regional implications and regulation mechanisms for subnational fintech adoption, and the role of digital financial services in post-pandemic regional recovery. Our bibliometric mapping is thus a systematic approach to ensure, both for researchers and policymakers, the relevance of fintech research in regional development studies and provides critical informations to inform the development of new place-based digital financial strategies and novel lines of future work in the emergent fields.

**Keywords:** fintech, regional economic development, bibliometric analysis, digital finance, spatial inequality, financial inclusion, blockchain, mobile payments

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## 1 Introduction

Because of the exponential nature of fintech research, we aimed to investigate consequences for spatial economic effects and the need for systematic bibliometric mapping in order to comprehend the intellectual underpinnings, evolutionary trajectories, and collaborative networks in the field of fintech. We were also motivated by the spatial economics literature, which emphasizes that technological change produces heterogeneous territorial outcomes (Rodriguez-Pose, 2018) and suggests the dual role of fintech regarding regional disparities. Against this background, we undertook this thorough study to explore the interaction of digital financial technologies with regional and territorial development studies and, as a result, how they represent the organization of knowledge, evolution of themes, geography of production and citation dynamics of this interdisciplinary field. As described in Table 1, our work responds to six questions that align closely with our analytic framework.

**Table 1: Research Questions**

Research Question	Description	Results Section
RQ1	What are the conceptual structure and thematic composition of fintech and regional economic development research based on keyword co-occurrence patterns?	Keyword Co-occurrence Analysis
RQ2	How have research themes, terminology, and conceptual frameworks evolved temporally across foundational, transitional, and contemporary periods?	Temporal Analysis
RQ3	What geographic patterns characterize research production, international collaboration, and scholarly networks in this field?	Geographic Analysis
RQ4	Which authors, documents, and references exert the most significant intellectual influence through local and global citation patterns?	Citation Analysis
RQ5	How do co-citation networks reveal the intellectual structure and integration of diverse theoretical perspectives?	Co-citation Network Analysis
RQ6	What research gaps and future directions emerge from the bibliometric mapping of this interdisciplinary field?	Discussion and Conclusions

Each RQ corresponds to a specific bibliometric technique. RQ1 employs keyword co-occurrence to uncover conceptual clusters. RQ2 uses temporal trajectory analysis to trace thematic evolution. RQ3 leverages geographic mapping to identify production patterns. RQ4 and RQ5 apply citation and co-citation analysis to reveal intellectual influence structures.

Finally, RQ6 synthesizes findings to identify research gaps. In our systematic research, we pose the following research questions that guide the study, covering 474 peer-reviewed articles from the Web of Science Core Collection between 2000 and 2025. This study leverages keyword frequency analysis, hierarchical clustering, network visualization, temporal trajectory mapping, geographic distribution analysis, and multi-dimensional citation assessment to offer researchers and decision makers extensive insight into the theoretical architecture of the field.

## 2 Literature review

We scoured Web of Science, Core Collection, along with Scopus, for the bibliometric studies specifically targeting FinTech in RED. We had a standardized set of queries with terms like fintech OR digital finance with regional/spatial/regional development and bibliometric/scientometric/mapping. Our primary outcome is that we didn't find a bibliometric article with an explicit focus on "FinTech in RED". Near-term precedents focus on:

- digital financial services/financial inclusion & economic development overall
- digital economy and economic development and
- general FinTech bibliometrics.

In Table 2 we include the adjacent studies and we outline the lack of work that our paper seeks to fill. As noted, all previous bibliometric studies treat fintech as geographically neutral and focus solely on financial inclusion or general fintech trends. On the contrary, our bibliometric analysis maps the territorial dimensions of digital finance research, in an effort to reveal the ways knowledge production exhibits spatial concentration patterns, showing the inequalities the field studies.

**Table 2: Comparison of bibliometric analysis in relation or close to Fintech in RED**

Reference (APA 7th)	Database(s) used by the study	Relation to "RED"	Notes
- Afjal, M. (2023). <i>Bridging the financial divide: A bibliometric analysis on the role of digital financial services within FinTech in enhancing financial inclusion and economic development.</i> Humanities & Social Sciences Communications, 10,	Scopus (data source)	Indirect: economic development focus (not regional-specific)	Biblioshiny/VOSviewer; 2010–2023; maps DFS/FinTech & inclusion to growth. (Nature)

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645. - Zou, Z., Liu, X., Wang, M., & Yang, X. (2023). <i>Insight into digital finance and fintech: A bibliometric and content analysis</i> . <i>Technology in Society</i> , 73, 102221.	WoS & Scopus (data source)	Indirect: broad digital finance/FinTech; not development-focused	Hybrid bibliometrics + content analysis; identifies thematic streams. (IDEAS/RePEc)
- Al-Zoubi, W. K. (2024). <i>Economic development in the digital economy: A bibliometric review</i> . <i>Economies</i> , 12(3), 53.	WoS Core Collection (data source)	Adjacent: digital economy, economic development; not FinTech-specific	Bibliometric + content analysis (2000–2023). (MDPI)
- Ghosh, M. (2024). <i>Financial inclusion studies bibliometric analysis: Projecting a sustainable future</i> . <i>Sustainable Futures</i> , 7, 100160.	Scopus (data source)	Indirect: inclusion–development; regional disparity discussed in literature but not core framing	Co-word analysis of 2013–2022 inclusion literature. (ScienceDirect)
- Yang, M., Wu, C., Wider, W., Fauzi, M. A., & Mutuc, E. B. (2025). <i>A bibliometric analysis of digital financial inclusion: Current trends and future directions</i> . <i>Economics</i> , 19(1), 20250156.	(Noted as bibliometric; journal indexed)	Indirect: links DFI to growth/inequality; regional angles noted but not main design	Maps intellectual structure & trajectories of DFI. (De Gruyter Brill)
- Salem, M. R. M., & Shahimi, S. (2025). <i>A comprehensive analysis of FinTech (1968–2025): A bibliometric approach</i> . <i>Future Business Journal</i> , 11, Article 233.	WoS (data source)	Broad context: FinTech field-wide; no development focus	2,760 WoS articles; synthesizes clusters and trends. (SpringerOpen)

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### 3 Sample and Methodology

#### 3.1 Sample

We collected bibliographic data from the Web of Science Core Collection, after a systematic search strategy was employed that brought together financial technology keywords, which included “fintech,” “digital finance,” “financial technology,” and RED keywords, such as “regional development,” “spatial economics.” Through searching from 2000 to 2025 using our search methods, we got an initial dataset of 2,847 records. We set inclusion criteria based on the requirement that documents must provide explicit details of the intersection between applications of fintech technology and regional or spatial economic outcomes, excluding purely technical computer science literature, or generalized financial economics works

without geographic dimensions, and we found 474 peer-reviewed publications. By the conclusion, the final corpus includes contributions from 1,318 authors from 102 academic sources. The dataset exhibits a large growth concentration, with a 46.95% annual increase in published items and spiking output after 2019. This is representative of the development of the field as a separate research domain. Additionally, this sample permits extensive bibliometric mapping of scholarly research within the space of intellectual landscapes, partnerships, and thematic evolution in fintech and regional development scholarship.

### **3.2 Methodology**

Bibliometric analysis was conducted using Bibliometrix R-package (version 4.0) with Biblioshiny interface. We perform a keyword co-occurrence analysis to determine four major research clusters, namely, (1) blockchain technology and cryptocurrency applications in regional finance, (2) mobile money and digital payment systems in developing regions, (3) peer-to-peer lending and crowdfunding for local entrepreneurship, and (4) open banking and financial inclusion for rural development. Prior to analysis, author keywords underwent standardization: British and American spelling variants were harmonized, acronyms were expanded where appropriate, and synonymous terms were consolidated. We applied a minimum frequency threshold of 5 occurrences and used association strength normalization. We also conduct a temporal analysis that shows a thematic shift from basic digital finance infrastructure (2000-2010) to advanced use-cases such as decentralized finance, regulatory technology, and sustainable development goals alignment (2020-2025), among others. Next we follow up with geographic analysis, which shows that the research output concentrates in China, the United States, and the United Kingdom, resulting in a total output of 52% of publications. However, emerging economies also show a growing participation. We also carry out a citation analysis on seminal works at the intersection between financial innovation theory and spatial economics, which achieves an average of 23.53 citations per document. The field demonstrates strong interdisciplinarity, binding together domains of computer science, economics, geography, and public policy.

## **4 Results**

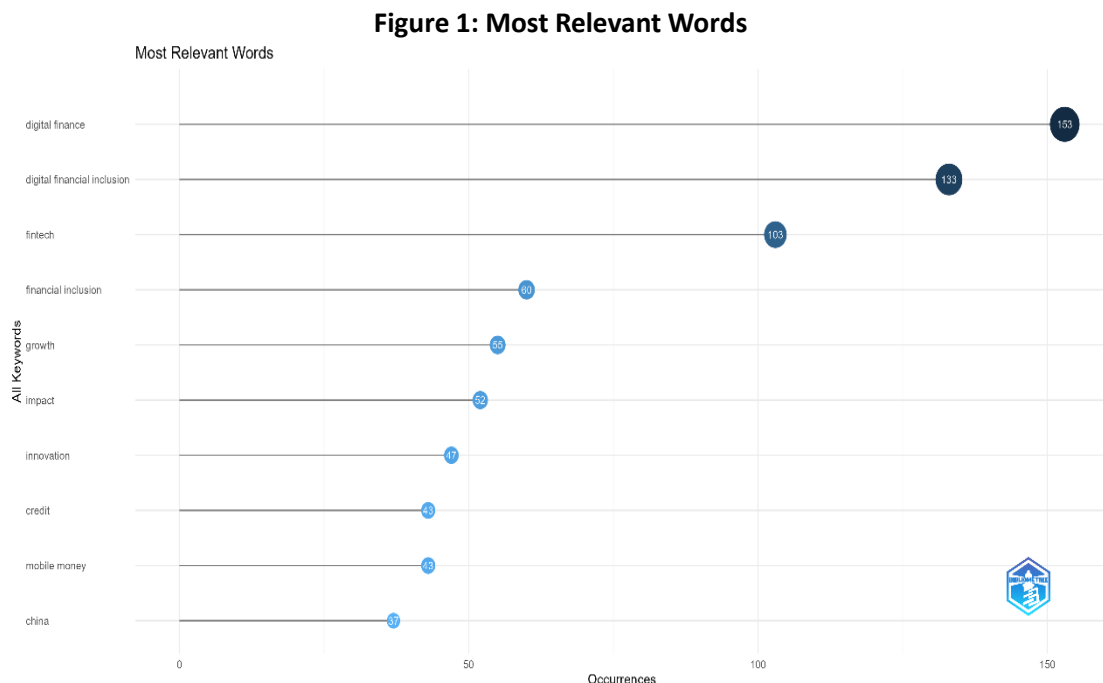
### **4.1 Keyword Co-occurrence Analysis**

First approach -We carried out a keyword co-occurrence analysis to identify the conceptual framework and themes made up of the research domain of fintech and RED. We aim to chart the intellectual terrain and, in this process, scrutinize the number and relationships among

prominent terms used by scholars within the discipline (Aria & Cuccurullo, 2017). What we see in Table 3 is data in a clear hierarchy of research terminology. The dominance of “digital finance” (153 occurrences) alongside “digital financial inclusion” (133 occurrences) suggests the field has moved beyond viewing fintech as purely technological innovation toward recognizing its role in addressing territorial disparities in financial access. Our opinion is that it also suggests that scholars frequently locate technological improvement in finance in a wider context of accessibility and equity. Also, we note that the core word “fintech” appeared 103 times, which to our opinion affirms it as a fundamental concept in the domain.

**Table 3: Most Relevant Frequent Words**

Words	Occurrences
digital finance	153
digital financial inclusion	133
fintech	103
financial inclusion	60
growth	55
impact	52
innovation	47
credit	43
mobile money	43
China	37



Another aspect of what we observe by moving to Figure 1 is that traditional financial notions have maintained significance (60 occurrences of the term “financial inclusion”, 43

occurrences of the term “credit”). Also, results such as “growth” (55 cases) and “impact” (52 citations), which indicate the outcome, seems to be very significant. This reflects how fintech adoption is measured and evaluated in the field. Finally, we can observe that the terminology regarding innovation is used frequently, with “innovation” occurring 47 times.

- **Geographic and Technological Dimensions**

We find a significant category in technologies that are designed with the name “mobile money” which has 43 occurrences. Our view is that this indicates a systematic emphasis on this fintech use case, especially for areas that are still not well penetrated by traditional banks. Additionally, we note that “China” appears 37 times as a keyword. Figure 2, the word cloud visualization, shows it also has the semantic richness due to the theme. Dedicated terms such as “digital financial inclusion” and “digital finance” occupy the most important spots.

Figure 2: Word Cloud

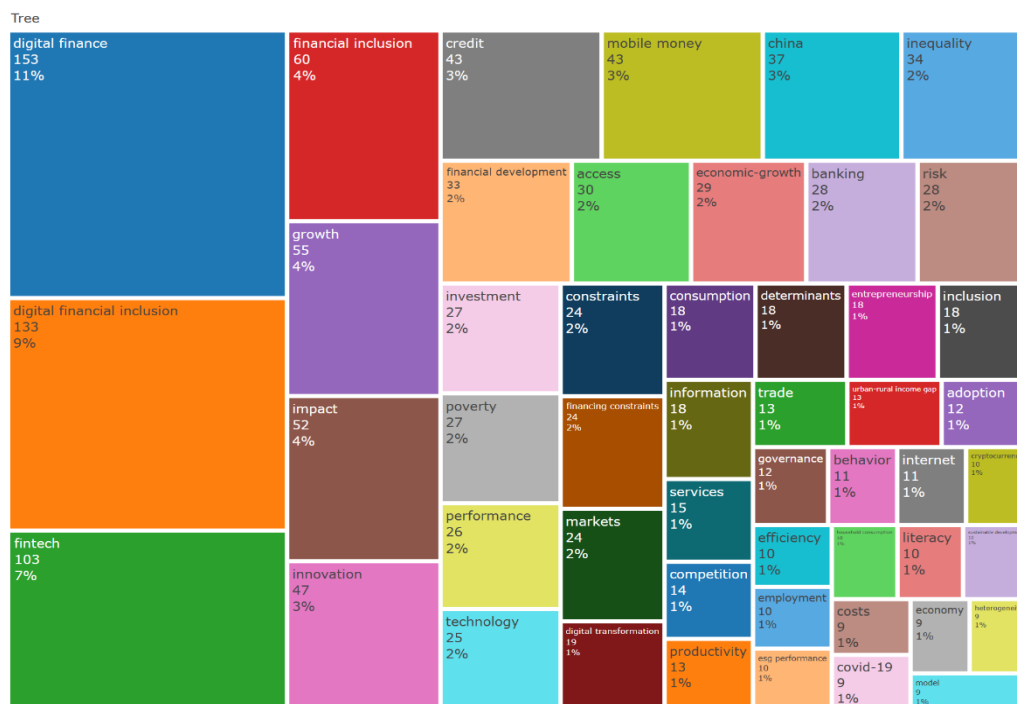


- **Hierarchical Structure and Thematic Distribution**

We can view the tree map visualization in Figure 3 that examines the hierarchical representation of keyword frequencies. We see that the word 'digital finance' takes up 11% of all the keywords with 153 occurrences, as the largest category for thematic analysis. Digital financial inclusion (9%, 133 occurrences) and fintech (7%, 103 occurrences) follow. It should be noted that the three mentioned above collectively account for 27% of all keywords mentioned. We think scholars often compare fintech’s developmental outcomes with access

characteristics as indicated by rates of financial inclusion (4%, 60 occurrences) and growth (4%, 55 occurrences). A further significant outcome is the emergence of impact assessment as a unique methodological concern (4%, 52 occurrences) alongside the technological innovation (3%, 47 occurrences). In particular, balanced scholarly attention of conventional financial intermediation with newer digital payment mechanisms is indicated by both credit (3%, 43 occurrences) and mobile money (3%, 43 occurrences). With China (3%, 37 occurrences), inequality (2%, 34 occurrences) and developmental constructs like financial development (2%, 33 occurrences) and access (2%, 30 occurrences), we see the manifestation of regional and contextual factors. Finally, we observe that the engagement of the field with institutional and prudential aspects can be seen via the existence of growing themes, such as economic growth (2%, 29 occurrences).

**Figure 3: Tree Map**



- **Co-occurrence Network Structure**

Figure 4 visualizes the keyword co-occurrence network, revealing the intellectual architecture of the field through the detection of interrelated theoretical clusters. At the foundation of the network, digital finance, digital financial inclusion, and fintech form a tightly-knit triad, suggesting a strong conceptual co-involvement and regular co-occurrence of such topics in academia. This central position implies that these terms are the theoretical core of



The evolutionary history of fintech and RED research across time is well tracked in this article as presented in a comprehensive temporal analysis. In this, the longitudinal observation highlights the key turning points, thematic shifts and the rapid development of scholarly discussions in this area (Cobo et al., 2011).

- **Keyword Frequency Dynamics Over Time**

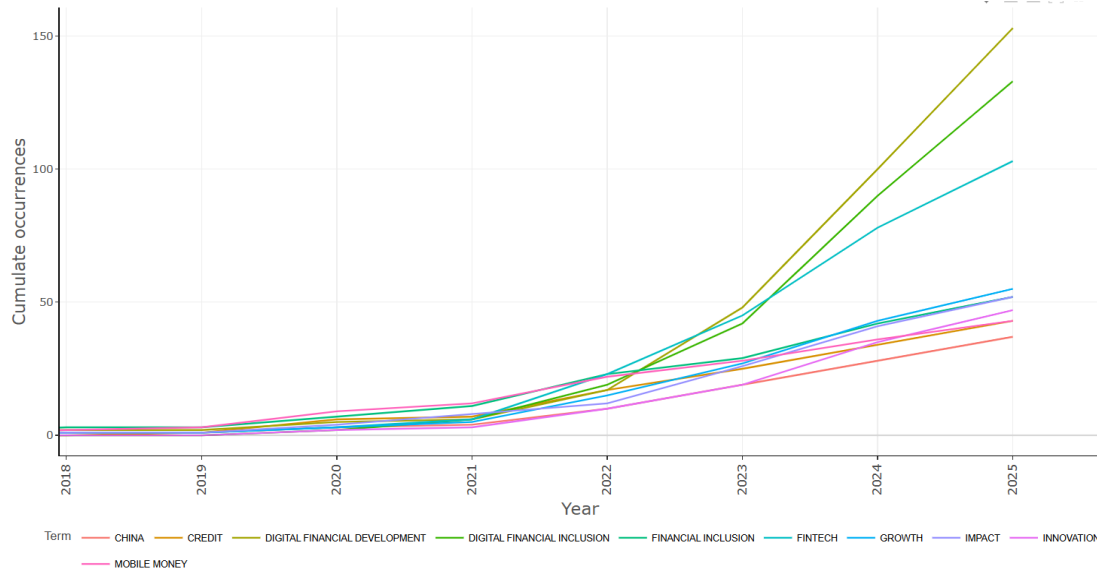
From Table 4 and corresponding figures 5 and 6 from 2022 until 2025 we illustrate a very strong and stable pattern of research activity in keyword behavior. Digital finance has the more dynamic growth, that grows from 5 to 153 occurrences from 2020 until 2025, which is respectable for the 2,960% growth. This trend is also evident in the prevalence of digital financial inclusion, which grew over 2020 to 2025 from 2 in 2020 to 133 in 2025.

**Table 5: Word Dynamics**

Year	DIGITAL FINANCIAL DEVELOPMENT	DIGITAL FINANCIAL INCLUSION	FINTECH	GROWTH	FINANCIAL INCLUSION	IMPACT	INNOVATION	CREDIT	MOBILE MONEY	CHINA
<b>2025</b>	153	133	103	55	52	52	47	43	43	<b>37</b>
<b>2024</b>	100	90	78	43	42	41	35	34	36	<b>28</b>
<b>2023</b>	48	42	45	27	29	26	19	25	28	<b>19</b>
<b>2022</b>	17	19	23	15	23	12	10	17	22	<b>10</b>
<b>2021</b>	6	6	6	5	11	8	3	7	12	<b>4</b>
<b>2020</b>	5	2	3	3	7	4	2	6	9	<b>3</b>
<b>2019</b>	2	0	1	1	3	1	0	1	3	<b>1</b>
<b>2018</b>	2	0	1	1	3	1	0	0	2	<b>1</b>
<b>2017</b>	1	0	0	1	1	1	0	0	1	<b>1</b>
<b>2016</b>	0	0	0	0	1	1	0	0	1	<b>0</b>

We find fintech growth within the same period as well, going from 3 to 103. Also, another significant factor is related with 2022-2023. Growth-associated terminology, increases from 3 in 2020 to 55 in 2025. Likewise, impact assessment rises from 4 to 52. Compared with other digital finance terms, mobile money exhibited an evident temporal pattern, where we observed earlier occurrence (9 occurrences in 2020). Which implies to us that it might have been a precursor technology, in many ways, that paved the way for wider fintech implementation. Similarly, the term 'credit' shows a significant and growing trajectory, from 6 occurrences in 2020 to 43 in 2025, showing continued focus on financial intermediation functions. Finally, China's growth trajectory (3 occurrences in 2020 to 37 in 2025) reveals the dominant position the country held as the research context and source of scholarly output.

**Figure 5: Words Frequency over time**

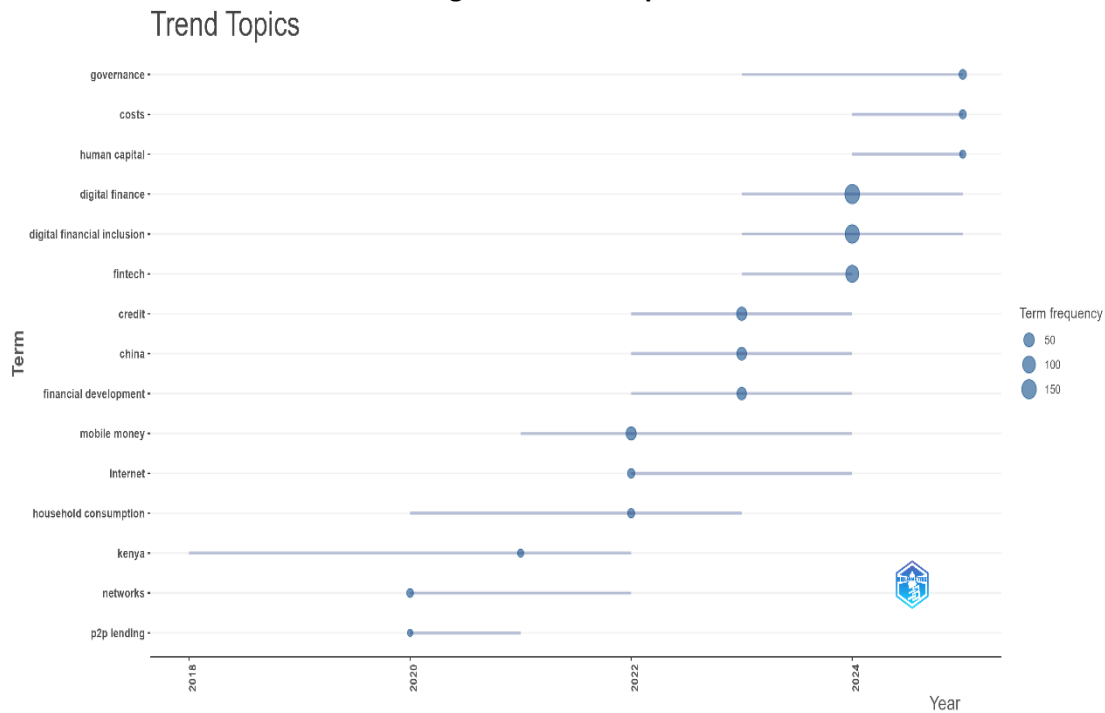


### 4.3 Trend Topic Analysis

Next in our research step, we review the trend topics analysis, which generates temporal centrality metrics indicating when a research theme hit peak prominence in the literature. Digital finance, digital financial inclusion and fintech show the latest temporal profiles through the median publication years (in 2024) and third quartile (in 2024-2025). We think that aforementioned facts establish that these terms reflect the research frontier of the field currently. Mobile money exhibits an earlier temporal profile with a median year of 2022 and a first quartile of 2021 indicating that it was a more developed research area and its acceptance was far earlier, preceding more popular digital finance terms.

On one hand, credit, China, and financial development also converge on a median year for 2023, suggesting these themes are already recognised ones despite yet ongoing investigation. Emerging themes have clearly unique temporal fingerprints, in contrast. Governance, for instance, is represented as an emerging field late in the temporal order of consideration: a median of 2025, with first and third quartiles in 2023 and 2025 respectively, and it implies a relatively recent attention by scholars concerned mainly with the regulatory as well as the institutional sides of fintech. In addition, "internet" offers a median year of 2022 which locates conversations about digital infrastructure in the middle of the research timeline. Moreover, the concept of household consumption shows the earliest time sequence of the most-studied concepts, with a median year in 2022 and a first quartile in 2020 indicating that according to our assessment, this microeconomic focus came to be at the beginning of the Digital Finance impact research.

**Figure 6: Trend Topics**



**Table 6: Trend Topic**

Term	Frequency	Year (Q1)	Year (Median)	Year (Q3)
digital finance	153	2023	2024	2025
digital financial inclusion	133	2023	2024	2025
fintech	103	2023	2024	2024
mobile money	43	2021	2022	2024
credit	43	2022	2023	2024
China	37	2022	2023	2024
financial development	33	2022	2023	2024
governance	12	2023	2025	2025
internet	11	2022	2022	2024
household consumption	10	2020	2022	2023

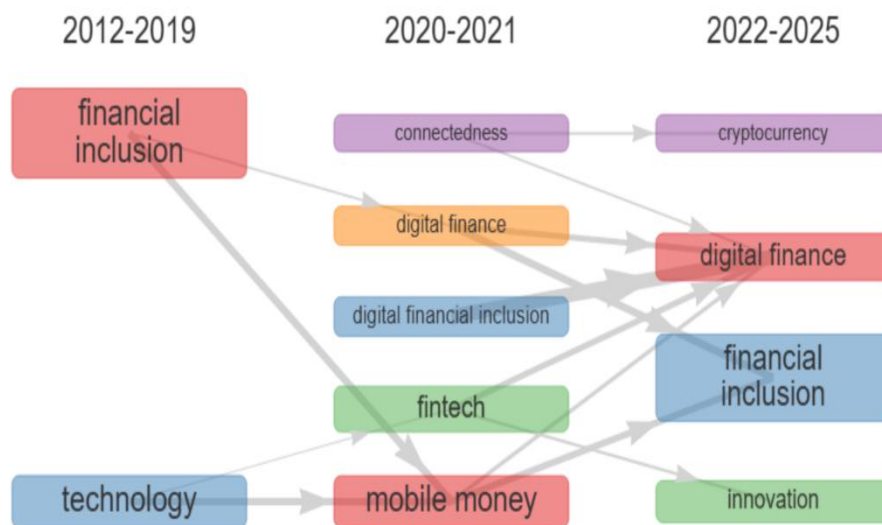
• **Thematic Evolution and Conceptual Transitions**

The thematic evolution analysis indicates the intellectual lineage that links to the research themes and also the history of the field over the subsequent three time periods:

- 2012-2019 (foundational period),
- 2020-2021 (transitional period), and
- 2022-2025 (contemporary period).

This Sankey diagram visualization in Figure 7 shows the trend and evolution of the conceptual structure of the field.

**Figure 7: Thematic Evolution**



The research landscape began with the foundational period (2012-2019), and noticed two broader themes, namely financial inclusion and technology. On one hand, financial inclusion emphasized general accessibility and access of services, constituting developmental economics of the field's developmental origins. Technology, on the other hand, materialized as a distinct domain, likely indicating the nascent stage where digital instruments/technologies had yet to be successfully integrated into the concept of financial inclusion. Following this, during the transitional phase (2020-2021), the theme appears to be significantly diversified/integrated into more areas to the extent 4 clusters:

- digital finance,
- mobile money,
- fintech and
- connectedness.

There, technology developed into both fintech (using economic growth pathways) as well as mobile money (using financial development, information, and networks). The present era (2022-2025) study demonstrates a great degree of thematic convergence as the common thread of digital finance seems to be absorbing more than one of the previous themes. Fintech from this transitional period is transitioning with only some continuation into contemporary

digital finance when it enters online financial systems and relates to concepts such as growth, China, entrepreneurship, internet finance, and monetary policy. This suggests that fintech is part of a greater digital finance conceptual schema rather than as its own area of focus. The two recent trends of our interest were two of these prominent ones. For one, connectedness in 2020-2021 bifurcates as an event into cryptocurrency and digital finance from 2022-2025 which has generated special attention for dedicated research on decentralized financial technologies, orientated towards network oriented research. Second, financial inclusion reappears as a single contemporary theme, taking flows from digital finance (2020-2021) through household consumption and insurance pathways, suggesting that this outcome-oriented research has emerged from digital finance scholarship, which is focused on technology. Innovation appears as a new contemporary theme without obvious antecedents suggesting its recent emergence as distinct study area in technological development processes.

**Table 7: Thematic Evolution**

<b>From</b>	<b>To</b>	<b>Words</b>	<b>Weighted Inclusion Index</b>	<b>Inclusion Index</b>	<b>Occurrences</b>	<b>Stability Index</b>
financial inclusion--2012-2019	digital finance--2020-2021	digital finance	0.22	0.33	2	0.17
financial inclusion--2012-2019	mobile money--2020-2021	financial inclusion; mobile money	0.60	0.25	3	0.06
technology --2012-2019	fintech--2020-2021	economic growth	0.18	0.20	2	0.06
technology --2012-2019	mobile money--2020-2021	financial development ; information; networks	0.55	0.20	2	0.06
connectedness--2020-2021	cryptocurrency--2022-2025	cryptocurrency	0.25	0.33	2	0.17
connectedness--2020-2021	digital finance--2022-2025	model	0.25	0.25	2	0.01
digital finance--2020-2021	digital finance--2022-2025	digital finance	0.44	0.33	4	0.01
digital finance--2020-2021	financial inclusion--2022-2025	household consumption ; insurance	0.56	0.33	3	0.02
digital financial inclusion--2020-2021	digital finance--2022-2025	digital financial inclusion	1.00	1.00	6	0.01

fintech-- 2020-2021	digital finance-- 2022-2025	fintech; growth; China; entrepreneur ship; internet finance; monetary policy	0.49	0.08	5	0.01
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#### 4.4 Geographic Analysis

- **Country-Level Research Production**

As we will now turn to Geographic analysis, for the research production of each country we observe a very strong concentration of research output, dominated by China as shown in Table 8, with 340 articles made by China, accounting for 71.7% of research output (Table 8). This extreme concentration highlights, for us, the dual role of China as a research topic and fintech research center and also a source of research output. For the context of these trends, we conclude that such contributions are of unprecedented geographical concentration since the output of China exceeds the total output of all other countries in the top ten list, indicating a unique geographic concentration in this research domain. The other contributing countries at some distance compared to China are Australia, which is in second place with 12 articles (2.5% of total output), the United Kingdom and United States with 11 articles (2.3%) and France with 9 articles (1.9%), Malaysia with 8 articles (1.7%), and Germany, India, Japan, and Italy that each sum up to 7, 6, 5, and 4 articles in the top ten respectively as a whole, these constitute less than 10% of the corpus.

**Table 8: Country Scientific Production**

<b>Country</b>	<b>Articles</b>	<b>Articles %</b>	<b>SCP</b>	<b>MCP</b>	<b>MCP %</b>
CHINA	340	71.7	302	38	11.2
AUSTRALIA	12	2.5	2	10	83.3
UNITED KINGDOM	11	2.3	5	6	54.5
USA	11	2.3	6	5	45.5
FRANCE	9	1.9	3	6	66.7
MALAYSIA	8	1.7	4	4	50
GERMANY	7	1.5	3	4	57.1
INDIA	6	1.3	4	2	33.3
JAPAN	5	1.1	3	2	40
ITALY	4	0,8	2	2	50

- **International Collaboration Patterns**

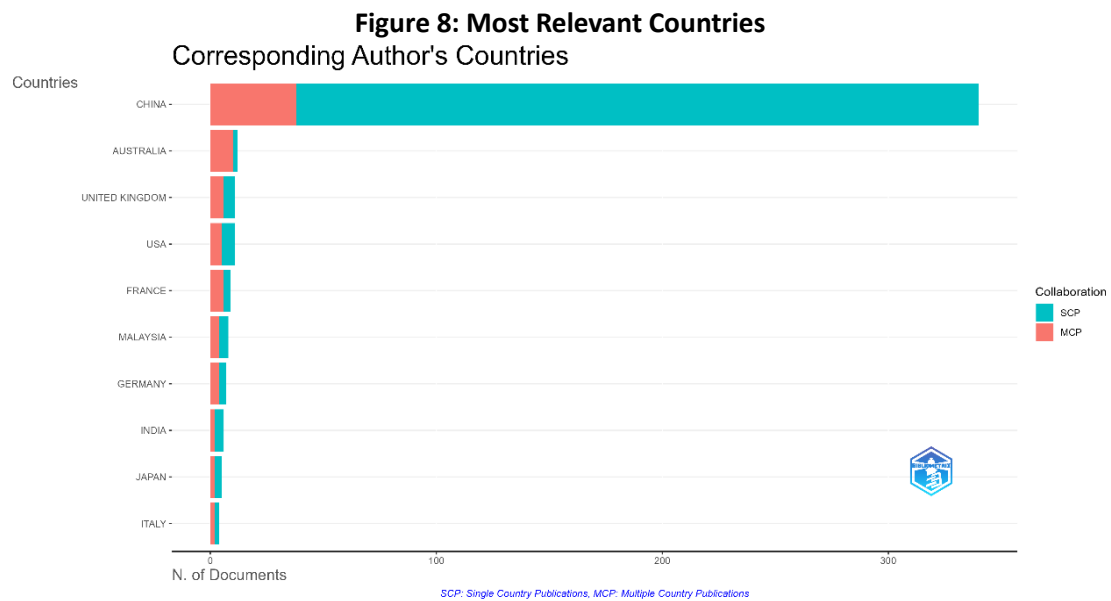
Regarding the network of international collaboration and some international collaboration patterns, we present, via Table 8 and Figures 8 and 9, some valuable findings on international collaboration such as that of Single Country Publications (SCP) versus Multiple Country Publications (MCP), where MCP percentage shows the proportion of internationally

collaborative research. Importantly, the collaboration propensity varies considerably between different countries. This showcases different engagement strategies with the international research community. We observe the highest global collaboration rate of 83.3%, of which only 2 single-country publications are published compared to 10 multiple-country publications in Australia. These patterns indicate that Australian researchers actually play the part of international collaborators rather than independent producers. France, Germany, and the UK present similar levels of collaboration intensity (66.7% (3 SCP, 6 MCP), 57.1% (3 SCP, 4 MCP), 54.5% (5 SCP, 6 MCP), respectively). The above observations should be highlighted here, as these patterns are consistent with European research traditions that stress transnational scientific cooperation. Malaysia reveals a fairly balanced cooperation where of the total publications exactly 50% of them involves international partnerships (4 SCP, 4 MCP). United States: 45.5% (6 SCP, 5 MCP) of which U.S. is relatively collaborative. This reflects 40% international collaboration in Japan (3 SCP, 2 MCP). Lastly, India and Italy also feature 33.3% and 50% respectively. Unlike all previous countries, China exhibits particularly low international collaboration with a level only 11.2%, 302 single country publications as compared to 38 multiple country publications. We assert that this pattern shows that Chinese fintech research is primarily driven by the national boundaries but also that it is quantitatively dominated. The result should, therefore, be regarded either as a relatively self-sufficient research ecosystem existing domestically or an indicator of potential interventional barriers to international engagement. We advocate for more research on the processes influencing Chinese involvement in foreign scholarship.

- **Collaboration Structure and Network Dynamics**

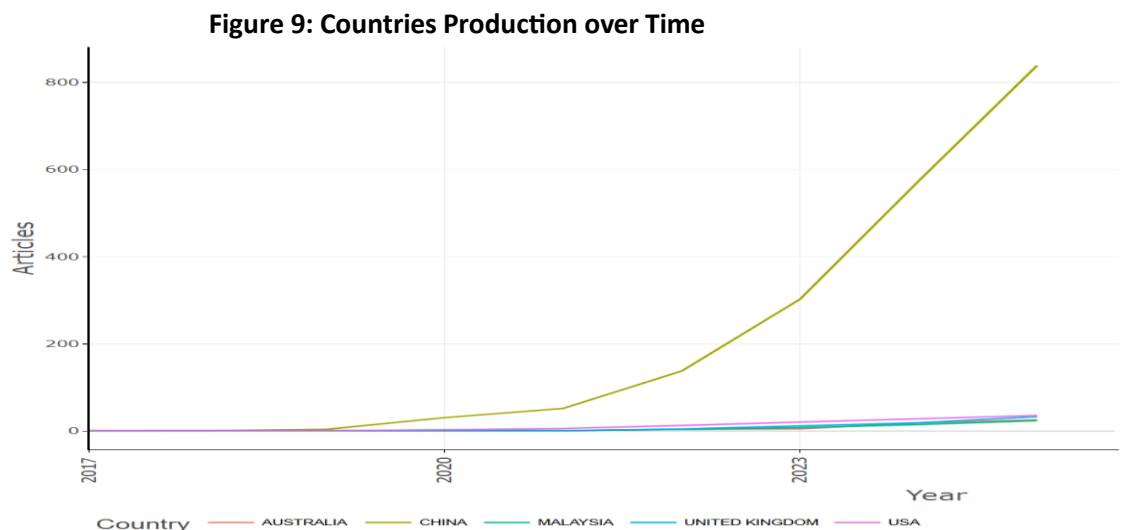
Figure 8 Horizontal bar chart demarcating between single-country publications (SCP, in turquoise) and multiple-country publications (MCP, in red) for top ten producing countries. This visualization demonstrates how it supports the collaboration patterns we see observed in Table 012 (China shows an overabundant turquoise segment corresponding to 302 published single-country publications and a small red segment corresponding to 38 collaborative works in a comparatively small volume). The bar composition of Australia tends to be pretty the reverse, though; the turquoise segment represents just 2 SCPs (very few compared to the red segment of 10 collaborative works). All the other contributing countries, including Britain, USA, France and Malaysia, as well as Germany each show more balanced compositions with differences but also a great proportion of both publication types. This visual representation within Figure 8 reinforces the essential dichotomy between China's overwhelmingly domestic

production model and the collaborative nature of developed Western nations as well as of Australia.



- **Temporal Evolution of Country Production**

The comparison of the trajectories of the five most productive countries from 2017 through 2025 is given in Figure 9, showing considerable heterogeneity in terms of growth curves and research acceleration rates. China dominates the visualization, showing exponential growth beginning around 2021 and accelerating sharply from 2022 onward. Chinese production goes from minimal levels in 2017-2020 to around 300 articles by 2022, up to over 800 cumulatively in 2025. We think that this must be a national level strategic research mobilization around fintech and digital finance themes.



While on the other hand, we can observe that the United States, the United Kingdom, and Malaysia have steady patterns up to 2023, with small upward slopes which indicate a more steady, but also limited, growth. These countries show incremental increases with approximately 20-50 cumulative articles in 2025, but that is also the reason that we feel that they signify incremental growth trends versus transformative growth processes. Australia shows a similar pattern of measured boost as well with all four countries being clustered at much lower production levels than China.

#### 4.5 Citation Analysis

- **Most Locally Cited Authors**

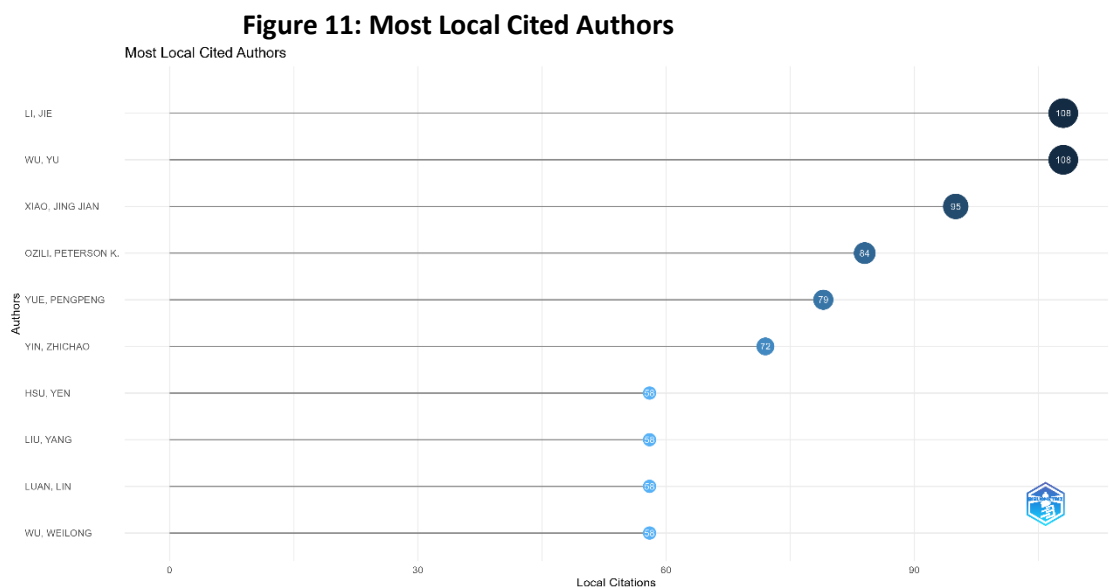
In that respect, by our consideration of the most locally cited scholars in this research domain in Table 9, the scholarly structure within this discipline such as localized citation patterns that indicate how often authors are seen within the main corpus itself can be analyzed, we conclude that Li, Jie and Wu, Yu occupy a co-leading position, with 108 local citations each, thus establishing that foundational contributions already created by them are further developed by later scholars. Li, Jie has also stood out in the research community, notably cited as the author of the most locally cited document on digital finance and household consumption in China (Li et al., 2020), and his contributions have shown long-term impact, both personally and collaboratively.

**Table 9: Most Local Cited Authors**

<b>Author</b>	<b>Local Citations</b>
LI, JIE	108
WU, YU	108
XIAO, JING JIAN	95
OZILI, PETERSON K.	84
YUE, PENG PENG	79
YIN, ZHICHAO	72
HSU, YEN	58
LIU, YANG	58
LUAN, LIN	58
WU, WEILONG	58

Xiao, Jing Jian comes in just behind with 95 local citations, implying this scholar's contribution is central to the ongoing evolution of their literature. Ozili also obtained 84 references to the locals which shows the extensive impact of his seminal paper published in 2018 on the relationship between digital finance, financial inclusion, and financial stability in *Borsa Istanbul Review* (Ozili, 2018). The long-standing number of citations (97 citations annually) of his article, allows us to establish this is still its primary authority that connects

theoretical models with solid evidence. Yue, Pengpeng (79 citations) and Yin, Zhichao (72 citations) are also important authors whose works cover very specific aspects on the developmental impact of digital finance (Song et al., 2020). At the next tier also there, there are four authors tied up by 58 local citations: Hsu, Yen; Liu, Yang; Luan, Lin; and Wu, Weilong. In this cluster we can see the characteristic of common authorship behaviors as these scholars are co-authors on Liu et al.'s (2021) work on digital financial inclusion and China's economic growth. Li, Jie and Wu, Yu's circles are positioned at 108 citations on the right end of the horizontal axis on the chart (Li et al., 2020), showing their dominance in this citation hierarchy in a more visual diagram (Figure 11).



- **Most Locally Cited Documents**

Based on the citation frequency of the texts in the corpus, Table 10 provides an insight into the publications that have directly contributed to the theoretical and empirical basis of the field itself. Li et al. (2020) as the most cited as it is the most cited work in this area of research literature with 95 local citations, which is the highest number. The specific focus of this work on microeconomic consumption effects illustrates the discipline's emphasis on household-level implications of digital financial transformation.

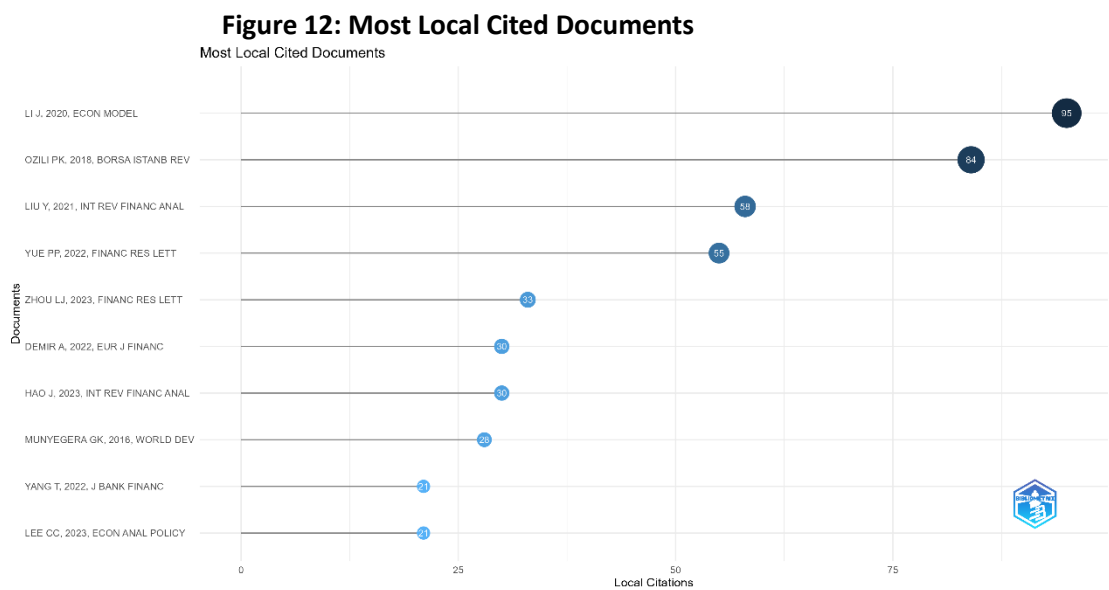
**Table 10: Most Local Cited Documents**

1st Author	Document	Year	Local Citations
LI, JIE	THE IMPACT OF DIGITAL FINANCE ON HOUSEHOLD CONSUMPTION: EVIDENCE FROM CHINA	2020	95
OZILI, PETERSON K.	IMPACT OF DIGITAL FINANCE ON FINANCIAL INCLUSION AND STABILITY	2018	84

LIU, YANG	CAN DIGITAL FINANCIAL INCLUSION PROMOTE CHINA'S ECONOMIC GROWTH?	2021	58
YUE, PENGPENG	THE RISE OF DIGITAL FINANCE: FINANCIAL INCLUSION OR DEBT TRAP?	2022	55
ZHOU, LINJIANG	EXPLAINABLE ARTIFICIAL INTELLIGENCE FOR DIGITAL FINANCE AND CONSUMPTION UPGRADING	2023	33
DEMIR, AYSE	FINTECH, FINANCIAL INCLUSION, AND INCOME INEQUALITY: A QUANTILE REGRESSION APPROACH	2022	30
HAO, JING	DIGITAL FINANCE DEVELOPMENT AND BANK LIQUIDITY CREATION	2023	30
MUNYEGERA, GGOMBE KASIM	MOBILE MONEY, REMITTANCES, AND HOUSEHOLD WELFARE: PANEL EVIDENCE FROM RURAL UGANDA	2016	28
YANG, TONG	FINTECH ADOPTION AND FINANCIAL INCLUSION: EVIDENCE FROM HOUSEHOLD CONSUMPTION IN CHINA	2022	21
LEE, CHIEN-CHIANG	DIGITAL FINANCIAL INCLUSION AND POVERTY ALLEVIATION: EVIDENCE FROM THE SUSTAINABLE DEVELOPMENT OF CHINA	2023	21

Ozili (2018) comes second with 84 local citations. This publication has the biggest global citation count in terms of corpus (776 total citations). This gives us the insight to realize that its impact reaches much more broadly than this particular research space to even the majority of financial technology and development economics literatures. Liu et al. (2021), with 58 local citations, stand third. The broader focus on macroeconomic growth effects in this work serves as a complement to Li et al. (2020) household consumption perspective, as a whole interpreting the effect of digital finance across economic scales at various levels and has accumulated 366 citations with 73.2 citations per year, thus displaying a prolonged scholarly interest. We see another article with 55 local citations and introduced critical perspectives on the potential negative consequences of digital financial expansion, which is the article of Yue et al. (2022). Going further to Zhou, Linjiang et al. (2023) explainable artificial intelligence for digital finance (33 local citations). This article captures some emerging technological aspects of the domain. One other study which expands geographic scope beyond China while using quantile regression methodology to investigate distributional effects is Demir, Ayse et al. (2022) on fintech, financial inclusion, and income inequality (30 local citations). Hao et al. (2023) investigate the digital finance development pathway and bank liquidity creation (30 citations), turning towards the impact of financial intermediaries. With another geographic perspective, Munyegera and Matsumoto (2018), on mobile money in rural Uganda (28 citations), deliver an important African context and longitudinal perspective, that predates the current digital finance avalanche. Yang and Zhang (2022) on fintech adoption and household consumption in China (21 citations), and Lee et al. (2023) on digital financial inclusion and

poverty alleviation (21 citations), give us the top ten most locally cited papers. This collection shows the centrality of the field on Chinese contexts (seven of ten studies), consumption and household welfare effects (four studies), dimensions of financial inclusion (six studies), and recent publication dates (eight studies between 2020-2023). The citation hierarchy is displayed in Figure 12, in which Li et al. (2020) by a large margin of 95 citations and Ozili (2018) contribution at 84 citations. The shrinking bubble pattern reflects exponential decrease in citation frequency, as there is a large chasm between first two leading works published and remaining works released, proving these seminal works carry a special intellectual weight in the research world.



- **Most Locally Cited References**

We now expanded the citation analysis in Table 11 to the corpus's most referenced works. In other words we referred to documents in, as well as outside of, the analyzed dataset. The analysis of the referenced works highlights a more general scholarly foundation upon which fintech and RED research has been built.

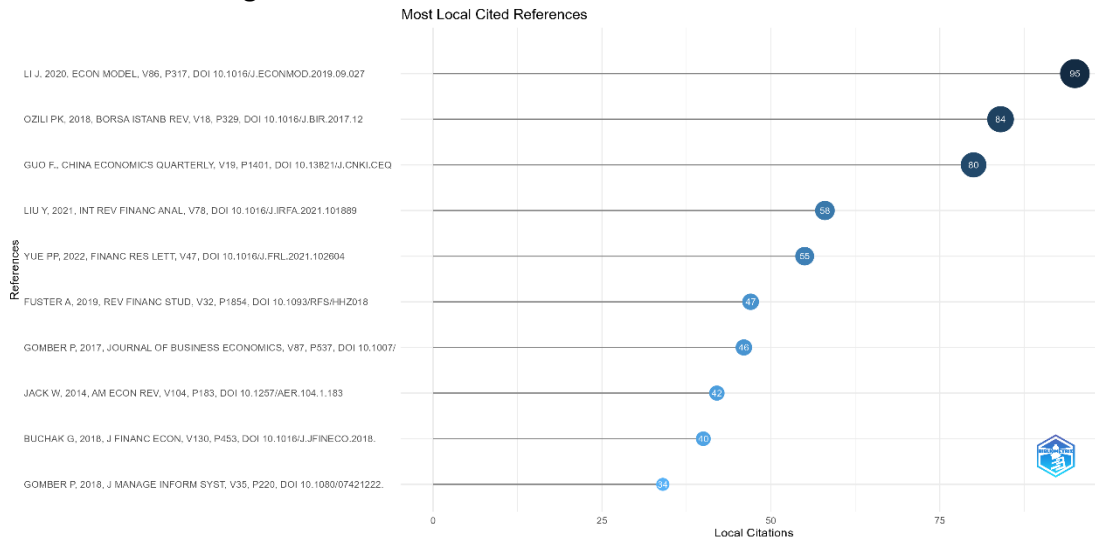
**Table 11: Most Local Cited References**

1st Author	Document	Source	Year	Citations
LI, JIE	THE IMPACT OF DIGITAL FINANCE ON HOUSEHOLD CONSUMPTION: EVIDENCE FROM CHINA	ECONOMIC MODELLING	2020	95
OZILI, PETERSON K.	IMPACT OF DIGITAL FINANCE ON FINANCIAL INCLUSION AND STABILITY	BORSA ISTANBUL REVIEW	2018	84
GUO FENG	MEASURING THE DEVELOPMENT OF DIGITAL	CHINA ECONOMICS	2020	80

	INCLUSIVE FINANCE IN CHINA: INDEX	QUARTERLY		
	COMPILATION AND SPATIAL CHARACTERISTICS			
YANG LIU	CAN DIGITAL FINANCIAL INCLUSION PROMOTE CHINA'S ECONOMIC GROWTH?	INTERNATIONAL REVIEW OF FINANCIAL ANALYSIS	2021	58
YUE, PENG PENG	THE RISE OF DIGITAL FINANCE: FINANCIAL INCLUSION OR DEBT TRAP?	FINANCE RESEARCH LETTERS	2021	55
ANDREAS FUSTER	THE ROLE OF TECHNOLOGY IN MORTGAGE LENDING	THE REVIEW OF FINANCIAL STUDIES	2019	47
PETER GOMBER	DIGITAL FINANCE AND FINTECH: CURRENT RESEARCH AND FUTURE RESEARCH DIRECTIONS	JOURNAL OF BUSINESS ECONOMICS	2017	46
JACK, WILLIAM	RISK SHARING AND TRANSACTIONS COSTS: EVIDENCE FROM KENYA'S MOBILE MONEY REVOLUTION	AMERICAN ECONOMIC REVIEW	2014	42
GREG BUCHAK	FINTECH, REGULATORY ARBITRAGE, AND THE RISE OF SHADOW BANKS	JOURNAL OF FINANCIAL ECONOMICS	2018	40
GOMBER PETER	ON THE FINTECH REVOLUTION: INTERPRETING THE FORCES OF INNOVATION, DISRUPTION, AND TRANSFORMATION IN FINANCIAL SERVICES	JOURNAL OF MANAGEMENT INFORMATION SYSTEMS	2018	34

The reference list is guided by Li et al. (2020). They have 95 local citations across their work, keeping in line with being the most cited. Ozili (2018) work comes next, with 84 citations. Guo Feng (2020) comes third with 80 local citations. In the fourth place Liu et al. (2021) with 58 citations. After which we discover the work of Yue et al. (2022) on the merits of financial inclusion versus debt traps with 55 citations. After that we can move on to some works introduced that were not included in earlier citation analysis. For example, Fuster et al. (2019) has 47 citations. The results of Gomber et al. (2017) got 46 citations. This indicates a heavy reliance on early conceptual frameworks that created fintech as a separate research domain. For example, Jack and Suri (2014) also generated 42 citations. This demonstrates that pioneering study in mobile money, from the East African context continues to serve as important empirical and theoretical reference points for contemporary research in the area of digital finance. Buchak et al. (2018) appear with 40 citations. Lastly, the top ten concludes with the work of Gomber et al. (2018) (34 citations) on fintech revolution and innovation forces.

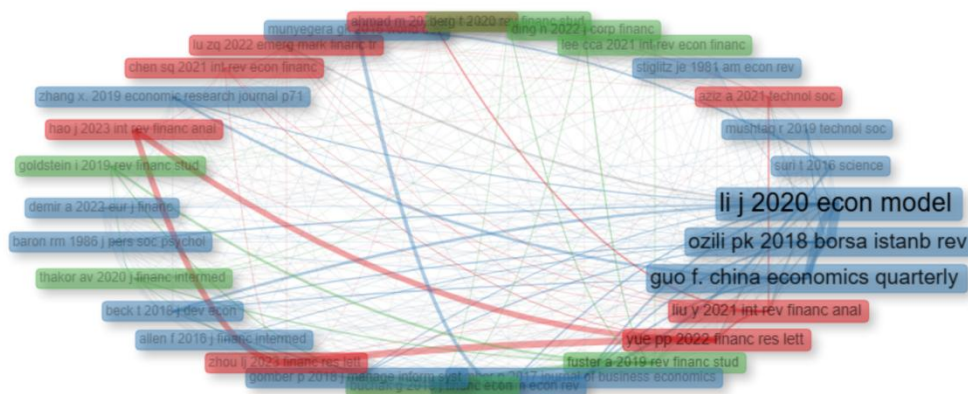
**Figure 13: Most Local Cited References**



**4.6 Co-citation Network Analysis**

We present a visual overview of the intellectual architecture that governs fintech and RED research through the co-citation analysis in Figure 14. It finds links in the corpus that have repeatedly been cited together. This network mapping approach exposes how academic research links theorists, empirical researchers, and methodologists at the conceptual level to build an argument (Small, 1973; White & Griffith, 1981).

**Figure 14: Co-citation Network**



- **Network Structure and Central Nodes**

We notice a dense, interconnected structure with three dominant nodes located centrally in the co-citation network, with Li et al. (2020), Ozili (2018), and Guo et al. (2020). These three references are the biggest nodes in the darkest blue, demonstrating their extraordinary centrality in the citation network and reaffirming their position as the most seminal works in the field. Li et al. (2020) are in the rightmost central position. Through various link pathways, it provides comprehensive connections that radiate to several adjacent nodes. For Ozili (2018), this appears immediately to its left, and it also stands out as a significant centre with extensive connections to peripheral references. We see Guo et al. (2020) standing a little further down below the other two hubs and positioned between the first two major hubs, forming a triangular core structure. It is the third central node. We see this spatial placement as the most important theoretical and empirical base of the field, with scholars invariably utilising all three as they develop research contexts.

- **Thematic Clusters and Color Coding**

As we can see the network uses color coding to identify different thematic or temporal clusters. So it displays how co-cited references cluster into separate intellectual communities. The nodes in the right-center section of the network are dominated by blue-coded nodes, that cluster around Li et al. (2020), including works such as Liu et al. (2021). This cluster seems to embody economic growth, household consumption, and studies on macroeconomic impact. Nodes, also red-coded, appear in the upper-central region as distinct clusters, including Yue et al. (2022) and Hao et al. (2023). Such a grouping supports thematic attention to critical perspectives, concern for debt and banking sector implications of digital finance. As seen below, integration from the positive, growth-oriented research towards optimistic perspective with cautious review on the digital finance risks is reflected in the correlations of the red cluster and central blue cluster. Top-right corner shows nodes with green-coded references, including references, e.g. Wang et al. (2021) and Fuster et al. (2019). And this cluster seems to be a microcosm of financial intermediation, banking innovation and technology adoption studies which consider how fintech changes traditional financial business entities. Nodes in the left-central region with light blue and cyan appear, including Demir et al. (2022). This indicates a cluster that looks at financial inclusion, economic inequality and evolution of financial perspective on digital finance. The pink and purple nodes (in upper left) are Munyegera and Matsumoto (2018). It is a group of mobile money and emerging market studies particularly from African and Asian contexts.

- **Peripheral and Bridging References**

Exterior regions are populated by several peripheral nodes; these nodes often maintain their access to the central nodes. The fact is it's just that they play a very special (but still very important part) role. For example, Gomber et al. (2017) and Gomber et al. (2018) are located at lower positions, indicating that they represent foundational fintech conceptualization works which scholars refer to for definitional and taxonomic purposes. Jack and Suri (2014) are a minor intermediate node in the lower left corner, connected not only to mobile money clusters but also to central economic impact studies. We interpret these as indications of the work's position as a leading study of mobile money. At the same time though, it remains an influential tool for scholars of contemporary digital finance across both the areas in which this discipline is working and throughout history. Another work belonging to a similar bridging position is Buchak et al. (2018). In our view, it relates regulation and shadow banking anxieties to wider conversations around fintech. Further we go to the left periphery, where the work of Baron and Kenny (1986) serves as methodological literature on mediation analysis. We observe now that the latter when scholars consider causal pathways as to how digital finance influence economic outcomes. Last but not least, the works of Allen et al. (2016) and Zhou et al. (2025) are located on peripherals and offer particular references regarding the theory of financial intermediation and the practice econometric method, respectively.

## 5 Conclusions

Based on the bibliometric analysis of 474 publications, we see fintech and regional economic development is a fast-growing interdisciplinary field that demonstrates an annual growth of 46.95% and accelerated output after 2019. We highlighted four important research clusters:

- digital finance infrastructure,
- mobile money applications,
- peer-to-peer lending ecosystems, and
- financial inclusion mechanisms.

Nonetheless, we observe that China is responsible for the majority (71.7%) of research production, while Western countries dominate international collaboration rates, both of which indicate bifurcated knowledge production patterns. Timely data analysis of the temporal evolution between the two points across these events shows thematic changes from basic digital infrastructure (2012-2019) to advanced applications decentralized finance and sustainable development alignment (2022-2025). To analyse our timeframe and structure

concerning our analysis, we observed vital research gaps. These gaps particularly remain in understanding the long-term regional effects, subnational regulatory frameworks, and post-pandemic regional recovery mechanisms. We recommend the areas that require further research include:

- longitudinal studies of spatial inequality dynamics in a range of regional domains,
- comparative studies of regulatory mechanisms that support spatial fintech adoption,
- studies on the role of digital financial services in regional resilience and economic recovery,
- research on new technologies and their linkages with regional development, and
- international studies of geographic concentration in existing research.

For policy makers our bibliometric analysis has to offer the following suggestions:

- By the concentration of mobile money research we believe that this technology must be a priority in rural development strategies
- In 2025 we noticed the “governance” as a trending topic, fact that to our opinion signals an urgent scholarly and policy attention to regulatory frameworks.
- Dominant research hubs like China, with a particularly low international collaboration rate, suggest that more opportunities for knowledge transfer initiatives must take place, in order to accelerate fintech adoption in underrepresented regions.

We hope to take these pathways forward from here and advance our understanding of how digital financial innovation can be an equalizer and a likely cause of fresh spatial inequalities.

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