Online Peer-to-Peer (P2P) Lending : A Systematic Literature Review Using Bibliometric Analysis

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Abstract

Purpose : The purpose of this bibliometric analysis was to find out the peer-to-peer lending platforms trend published from 2010 to 2024. The data was collected from Scopus and the Web of Science database. The present study aimed to uncover research areas of focus, leading authors, journal categories, and country affiliations in the area of peer-to-peer lending.

Design/Methodology/Approach : The investigation, which included estimations of nation affiliation, journal classification, author productivity assessment, and extensive keyword research, was conducted using *R* programming. Over the 15 years, a total of 1,401 publications were reviewed and categorized in order to find patterns and trends.

Findings : The study revealed that there were a considerable number of articles from China. It was also evident that most are consistent with P2P lending research. The central themes of the present study involved crowdfunding, fintech, credit scoring, and artificial intelligence. Remarkably, the *Finance Research Letters* journal appeared to be the best in the area, and LIU Y was named as the most renowned author.

Practical Implications : The outcome could be compared to financial technology policymakers' and researchers' decisions to guide policy and research topics. By understanding worldwide trends and academic collaboration in peer-to-peer lending research, we can make decisions and improvise the field with ample depth evidence.

Originality/Value : This study thus completed the ongoing search for information and understanding about the innovative settings of peer-to-peer lending in the fields of academia, finance, and technology. Identification of key research trends, prominent contributors, and policy trends enables the survey to provide insightful data for future research.

Keywords : **P2P lending, bibliometrics, *R* programming, peer-to-peer lending, citation analysis, and co-citation analysis**

JEL Classification Codes: G21, G23, O16

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Technology advances impact various aspects of life, including the economy, education, medicine, and financial services (Nath et al., 2019; Sardana et al., 2024; Zand, 2020). One area of the financial services sector that has significantly evolved due to technological advancements is online peer-to-peer (P2P) lending (Chen & Hassink, 2022). Online P2P lending has emerged as a popular alternative to conventional bank loans in recent years as a result of advancements in information and communication technology (Basha et al., 2021). It offers an online electronic marketplace that matches lenders with borrowers, designed in such a way that it cuts down on operational and infrastructure costs, enabling a high return for the lender and a low-cost

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borrower (Liu et al., 2020). P2P lending platforms are online finance where lenders compete to provide loans to borrowers (Wei & Lin, 2017). These platforms use digital technologies like cryptography, distributed computing, AI, big data, and mobile access to facilitate the loan process (He et al., 2017).

Zopa was the first UK P2P lending network, created in 2005. Once Prosper entered the market in February 2006, Lending Club followed. According to Transparency Market Research (2022), the global P2P lending industry is expected to grow by 29.3% yearly to reach 1.14 trillion US dollars by 2031 from an estimated 89.23 billion dollars in 2021. Asia Pacific, South America, Africa, North America, the Middle East, and Europe are covered by the market, which has categories including student loans, real estate, and commercial and consumer loans for small businesses.

Studies on P2P lending online are becoming more prevalent (Ariza-Garzón et al., 2021; Chen & Hassink, 2022; Chen et al., 2023; Gao et al., 2020; He et al., 2021; Kriebel & Stitz, 2022; Li & Hu, 2022; Ma et al., 2021; Sunardi et al., 2022; Taleizadeh et al., 2022; Wang et al., 2019; Zhong & Jiang, 2021). Zopa, the first online platform, gained popularity in 2005. Prosper.com made its data public in 2007, sparking contributions from the scientific community. Scholars have since examined P2P lending platforms, lender-borrower relationships, technological features, borrower identification, default risk projections, P2P lending rates, and lending tactics across a range of disciplines. Further articles discuss subjects like the factors influencing P2P lending (Bachmann et al., 2011; Sunardi et al., 2022) and auction procedures, forecasting defaults, regulation, integration, nation-specific problems, and the impact of digitization on financial access (Bollaert et al., 2021; Putri et al., 2022). Basha et al. (2021) conducted a review of the literature on determinants and regulatory contexts, and Kholidah et al. (2022) used VOS viewer software to conduct a bibliometric analysis of the P2P lending literature. Furthermore, the authors highlighted the importance of combining data from various databases and offered prospective future routes for literature reviews. These insightful reviews contribute significantly to our comprehensive understanding of the multifaceted realm of P2P lending. Despite the growing popularity of P2P lending platforms, there is a lack of comprehensive literature review analysis to identify trends in this field. This research gap sounds like a comprehensive literature review to identify trends in the area of online P2P lending platforms.

To the best of our understanding, no previous study has used *R* programming to do bibliometric analysis on P2P lending literature utilizing data from WOS and Scopus. There are currently very few review papers in the literature that specifically explore online P2P lending. Next, we determined that an extensive literature review that presents a summary of the current state of scientific research in P2P lending was necessary. Our goal is to synthesize academic field-wise contributions and P2P lending perspectives by incorporating numerous relevant research contributions. This study focuses on scientific achievements as well as patterns in academic collaboration, and it serves as an example for displaying global trends in P2P lending research. We conclude with suggestions for future research in online P2P lending.

This article examines the following research questions (*RQs*):

↳ ***RQ1 :*** What are the most prominent researchers working in this area and their substantial contributions to the advancement of scientific research contribution?

↳ ***RQ2 :*** What are the most frequent phrases, co-occurrence networks, clusters, and crucial connections with other notable sources?

↳ ***RQ3 :*** Which are the most popular subjects for this kind of research?

Methodology Framework

There is a widespread application of bibliometrics in the conduct of scientific research across a variety of fields (Ludhani et al., 2023; Sardana et al., 2023). The present study employs bibliometric techniques to analyze

quantitative literature research (Shiffrin & Börner, 2004). Additionally, objective assessment indicators are utilized to examine and evaluate growth trends for a certain topic (Kumar et al., 2023; Mao et al., 2018). This research aims to achieve both of these objectives. Figure 1 presents the conceptual model that was used in our research. The first stage in the procedure is deciding which database to use for this research. We have opted for Scopus and WoS due to their capacity to explore the entire citation network (Dimitrov, 2016) as well as their inclusion of peer-reviewed journals, books, conferences, and book chapters across various disciplines, such as the social sciences, management studies, humanities, and engineering studies. The advanced search query was executed in two stages: the first involved gathering data from Scopus and choosing specific keywords to cover different areas of our study; the second stage involved gathering data from WoS and choosing specific keywords to cover additional areas of our research. There were a total of 1,832 publications recovered between 2010 and 2024 (1,214 from Scopus and 618 from WoS). The following syntax was used during the data collection process: To perform a subject search, use the following query: * TS = ("social" AND "lending" OR "peer to peer" OR "P2P"). We selected the data for additional research so as to select the papers that would be examined in light of the findings.

Figure 1. ***The Conceptual Model of the Research Process***

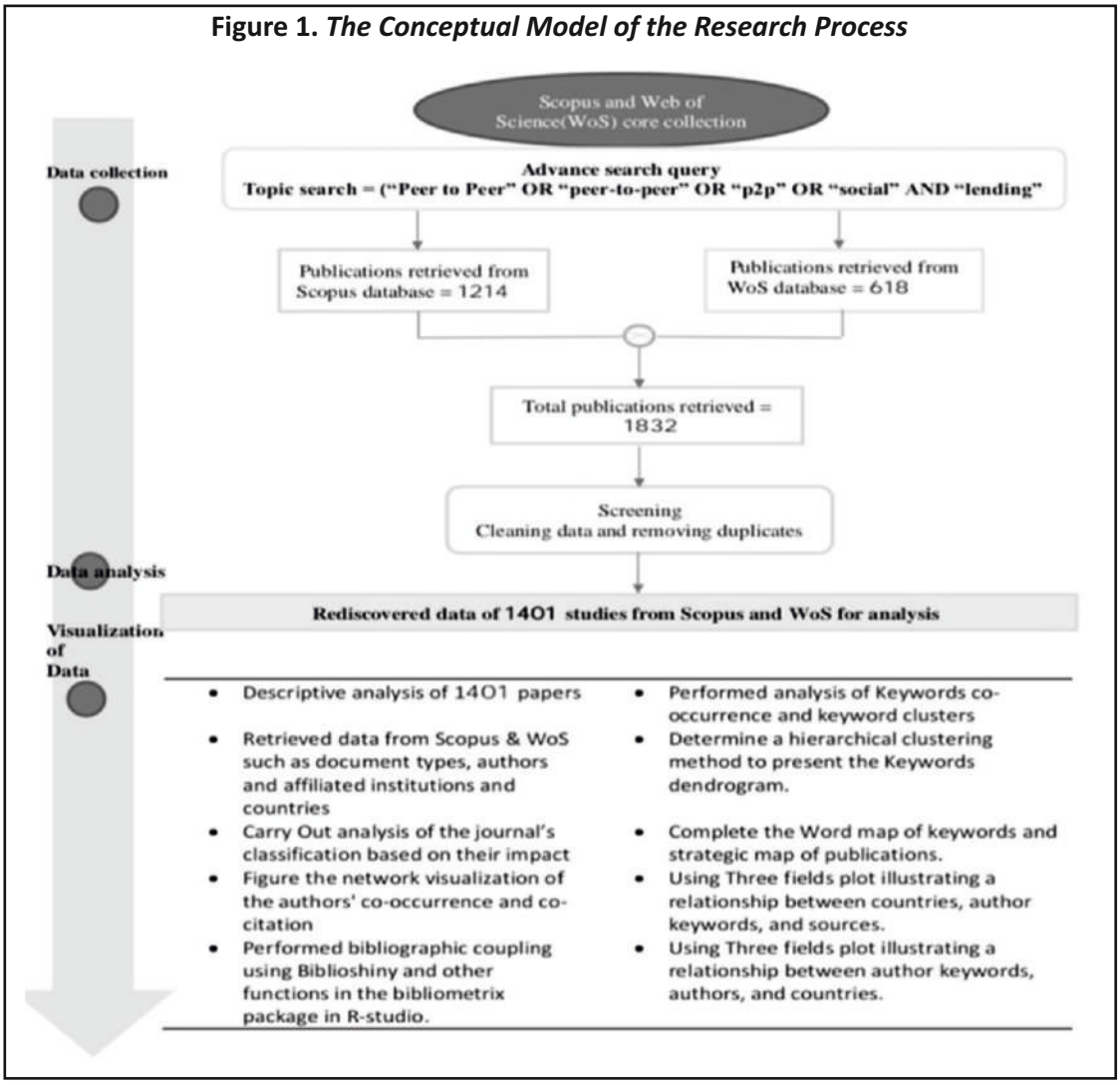


Figure 1 shows the exact steps that were taken during the search. We utilized the following criteria to decide who would be included:

- A review of all scientific literature sources registered with WoS and Scopus will take place between 2010 and 2024 (for example, books, conferences, and journals).
- The study articles should be on P2P lending.

This should be the primary focus of the research. After applying the cleaning process, a total of 1,401 articles were found, which retrieved data from Scopus and WoS. Information gathered from Scopus and WoS included document kinds, authors, affiliated institutions, and countries. To explore journal categorization, keyword analysis, co-occurrences and co-citations of authors, and clustering techniques, RStudio is used to install and update the bibliometrix packages, including biblioshiny. This was done to control many tiered clustering processes in order to present the data.

Materials Collection

A two-phase process was followed to gather a set of papers from the databases: Scopus and WoS. First, the keywords were chosen using the same process as Ahuja and Madan (2022) and Kazemi et al. (2019), in which the main theme was changed into the keywords using a range of permutations. The keywords used for the papers included "P2P lending," "peer to peer lending," and "social lending." In addition, we collected publications that were gathered up through the first quarter of 2024. We compiled 1,401 publications from WoS and Scopus as a consequence. We used RStudio to check the names of the publications in the dataset, cross-checked it, and eliminated data duplications of 431 publications. The data set was completed with 1,401 papers after duplicates were removed.

Analysis and Results

Table 1 summarizes the relevant evidence about the studied publications based on our keyword research. We can see broad information first. Subsequently, data on the categories of papers are found, together with details regarding the keywords used by the authors. Words or phrases that commonly occur in the titles of an article's references but do not appear in the article itself are included in the KeywordsPlus data section. Table 1 presents data about authors and, ultimately, data about author collaboration. According to the findings, the Scopus and WoS databases searches revealed 1,401 papers from 2010 to 2024, encompassing a wide range of topics such as P2P lending, credit score, default risk, machine learning, and so on; the research was published in 856 peer-reviewed journals and books, etc. A total of 2,306 authors—of whom 2,124 produced multi-authored papers—published these articles. Out of the 2,124 total, there are 182 research articles with a single author. An international co-authorship percentage is 7.209, and the co-author per document is 2.84. Table 1 provides a summary of the descriptive analysis.

Table 1. ***Main Information Concerning Data Collected from Scopus and WoS***

Key Information About Data	
Timespan	2010:2024
Sources (Journals, Books, etc)	856
Documents	1,401
Annual Growth Rate %	5.31

Document Average Age	4.88
Average Citations per doc	13.56
References	11,454
Document Contents	
KeywordsPlus (ID)	2,622
Author's Keywords (DE)	2,835
Authors	
Authors	2,306
Authors of single-authored docs	182
Authors' Collaboration	
Single-authored docs	250
Co-Authors per doc	2.84
International co-authorships %	7.209
Document Types	
Articles	808
Article Article	3
Article conference papers	2
Article conference review	1
Articles; Book chapters	17
Articles; Proceedings paper	3
Books	12
Book chapters	80
Book chapter articles	2
Book chapter erratum	1
Conference papers	228
Conference paper and book chapter	1
Conference paper conference paper	1
Conference paper conference review	1
Conference reviews	30
Corrections	2
Editorials	4
Editorial material	1
Editorial materials; Book chapters	3
Erratum	6
Notes	2
Proceedings paper	170
Retracted	1
Reviews	21
Review review	1

Figure 2 depicts the number of publications on P2P lending distribution over time. The number of articles has expanded gradually since 2014. It demonstrates the subject's growing importance. From 2010 to 2013, the number

of publications was quite limited at the start of the 21st century. From 2014 to 2017, there was a noticeable increase in volatility in the number of research documents, with the peak number being recorded in 2016 and 2017 with 90 and 86 papers, respectively. The number of publications increased from 2018 to 2023, hitting a single-year high of 194 in 2020. There will be the same amount in 2021, 2022, and 2023 as there was in 2020. An increasing trend was observed in the total number of publications. Three phases could be distinguished based on the rate of expansion. The first phase, from 2010 to 2013, shows less change in article publications, throughout that period. The second phase, which is between 2014 to 2017, and the curve's moderate rise represents the expansion of this research topic through published papers. The final phase is characterized by a stepper slope, indicating an increase in the number of research articles, demonstrating the importance of the P2P lending research topic (Figure 2).

Table 2 shows that 14.1% of overall researchers (326 authors) produced two publications, while 5.8% of the total researchers (133 authors) produced three articles. Furthermore, 2.9% of all scholars (66 authors) contributed four papers, 1.6% of all scholars (38 authors) contributed five papers, 1% of all scholars (24 authors) contributed

Figure 2. ***Number of Publications Over the Years on Peer-to-Peer Lending***

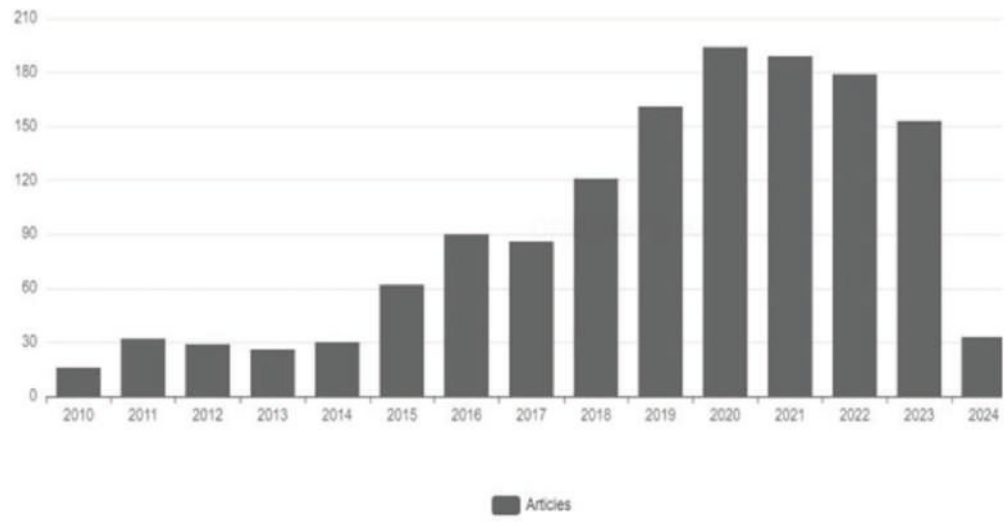


Table 2. ***Article Publications by the Corresponding Authors***

Documents Written	No. of Authors	Proportion of Authors
1	1,663	0.721
2	326	0.141
3	133	0.058
4	66	0.029
5	38	0.016
6	24	0.01
7	15	0.007
8	11	0.005
9	7	0.003
11	4	0.002

six papers, 0.7% of all scholars (15 authors) contributed seven papers, 0.5% of all scholars (11 authors) contributed eight papers, 0.3% of all authors (7 authors) provided nine papers, and 0.2% of all authors (4 authors) wrote 11 papers.

Source Patterns

A total of 1,401 papers from 856 distinct sources were published between 2010 and 2024. The most pertinent and highly ranked sources are highlighted by the article classifications shown in Figure 3 and Table 3. The top source is *Finance Research Letters*, which has the most articles (21 publications), followed by *Electronic Commerce Research and Applications* (18 publications), *Financial Innovation* (17 publications), and *ACM International*

Figure 3. ***Journal Classifications Based on their Publications***

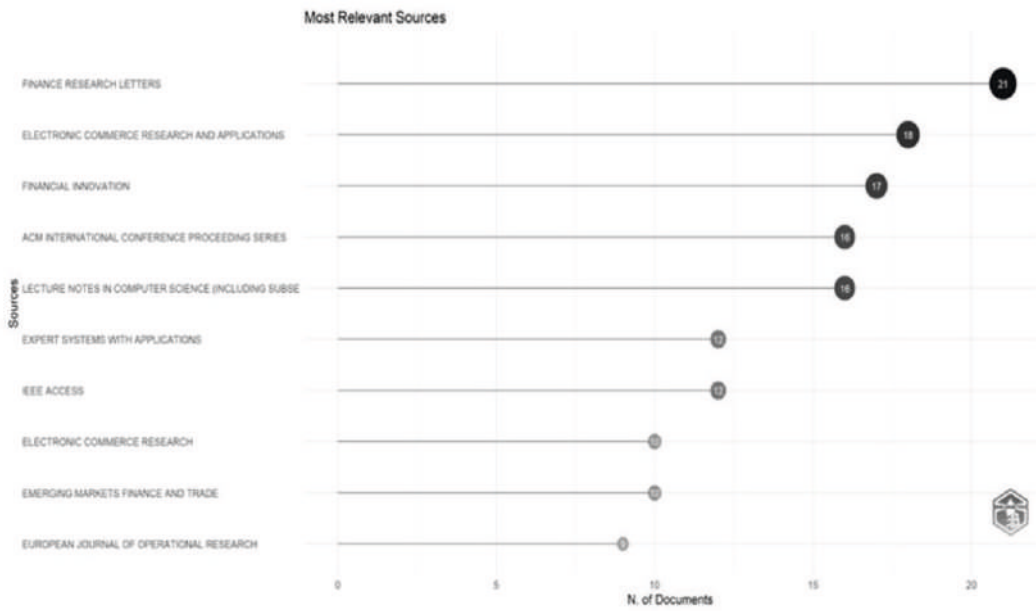


Table 3. ***The Productivity of the Top Ten Journals According to the h-Index***

Source	*h*_index	*g*_index	*m*_index	TC	NP	PY_start
Electronic Commerce Research and Applications	13	18	1	677	18	2012
Finance Research Letters	10	15	1.429	244	21	2018
Financial Innovation	9	14	0.9	213	17	2015
Expert Systems with Applications	7	12	0.583	396	12	2013
Electronic Commerce Research	6	10	0.75	146	10	2017
European Journal of Operational Research	6	9	0.667	523	9	2016
IEEE Access	6	12	0.857	153	12	2018
Journal of Corporate Finance	6	9	1.2	247	9	2020
Management Science	6	6	0.462	1,313	6	2012
Communications of the Association for Information Systems	5	5	0.357	120	5	2011

Note. TC- Total citations, NP- Number of publications, PY_Start- First Year of publication.

Conference Proceeding Series (16 publications). The *h*-index is a special metric that takes into account the effectiveness and influence of journal citations in general. According to Table 3, the journal that has the highest *h*-index is *Electronic Commerce Research and Applications*, which began publication in 2012. The first publication date of an article in each of those journals is indicated by the start year in Table 3. *Management Science* has received the greatest number of citations (1,313), followed by *Electronic Commerce Research and Applications* (677 citations).

Main Authors and Network Visualization

Table 4 and Figure 4 show the productivity classification of the authors based on their overall *h*-index. A study of the most prolific and notable authors provides a deeper knowledge of each author's contribution and impact on the

Figure 4. ***The Output of Authors Throughout Time***

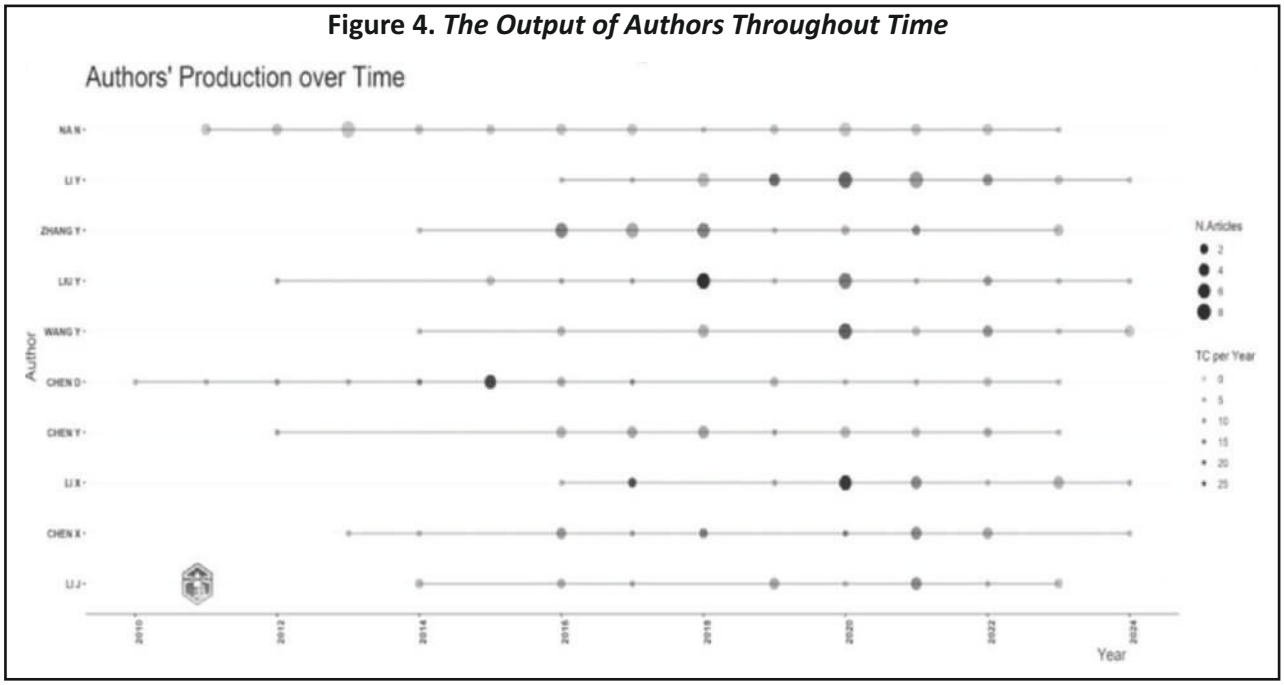


Table 4. ***Productivity of the 10 Leading Authors According to the h-Index***

Authors	*h*_index	*g*_index	*m*_index	TC	NP	PY_start
Liu Y	12	19	0.923	381	25	2012
Chen D	10	20	0.667	516	20	2010
Zhang Y	10	16	0.909	282	27	2014
Liu Q	9	13	0.818	261	13	2014
Zhao H	9	13	0.818	220	13	2014
Chen X	8	17	0.667	296	17	2013
Chen Y	8	13	0.615	185	20	2012
Wang H	8	14	0.533	273	14	2010
Li J	7	11	0.636	128	16	2014
Li Y	7	15	0.778	254	33	2016

Note. TC- Total citations, NP- Number of publications, PY_Start- First Year of publication.

area of research. According to Wang et al. (2016), prolific writers generate a lot of work and improve their field of study. Hirsch (2005) stated that citations inside a certain corpus are used to analyze and define the scientific output of academics using the *h*-index (Nia & Ruiz-Martínez, 2018). The *g*-index (Rey-Martí et al., 2016) is one of the versions of the *h*-index that is derived depending on the citation circulation of certain researchers' publications. It refers to the index that rewards academics with a large number of citations for some of their works.

Interestingly, LIU Y is observed to be the most productive and significant author. Liu Y has the highest *h*-index (12), with 25 articles cited 381 times, followed by Chen D and Zhang Y, who have the second highest *h*-index (10), with 20 publications cited 516 times and 27 papers cited 282 times, respectively.

The maximum frequently cited articles and journals are displayed in Table 5; the number of citations determines the rank of the article and is also significantly related to P2P lending. A noteworthy addition to the study of friendship networks and information asymmetry in P2P lending is made by Gomber et al. (2018). Their article published in the *Journal of Management Information Systems* established the foundation for empirical research on disruption, innovation, and transformation in financial services. The second article referenced was written by Duarte et al. (2012) and published in *The Review of Financial Studies*. This paper examined the

Table 5. ***Top Ten Most Cited Scientific Articles and Journals***

Authors	Source	Title	Total Citations	TC per Year	Normalized TC
Gomber et al. (2018)	*Journal of Management Information Systems*	"On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services"	706	100.86	36.44
Duarte et al. (2012)	*The Review of Financial Studies*	"Trust and Credit: The Role of Appearance in Peer-to-Peer Lending"	595	45.77	9.97
Lin et al. (2012)	*Management Science*	"Judging Borrowers by the Company They Keep: Friendship Networks and Information Asymmetry in Online Peer-to-Peer Lending"	526	43.83	20.11
Bruton et al. (2015)	*Entrepreneurship Theory and Practice*	"New Financial Alternatives in Seeding Entrepreneurship: Microfinance, Crowdfunding, and Peer-to-Peer Innovations"	506	50.60	11.15
Pope & Sydnor (2011)	*Journal of Human Resources*	"What's in a Picture?: Evidence of Discrimination from Prosper.com"	413	29.50	7.89
Thakor (2020)	*Journal of Financial Intermediation*	"Fintech and Banking: What do we Know?"	390	78.00	39.30
Zhang & Liu (2012)	*Management Science*	"Rational Herding in Microloan Markets"	387	29.77	6.49
Emekter et al. (2015)	*Applied Economics*	"Evaluating Credit Risk and Loan Performance in Online Peer-to-Peer (P2P) Lending"	352	35.20	7.76
Belleflamme et al. (2015)	*Information Economics and Policy*	"The Economics of Crowdfunding Platforms"	344	34.40	7.58
Herzenstein et al. (2011)	*Journal of Marketing Research*	"Tell me a Good Story and I May Lend You Money: The Role of Narratives in Peer-to-Peer Lending Decisions"	281	20.07	5.37

Figure 5. ***Co-author Network and the Most Effective Collaborations***

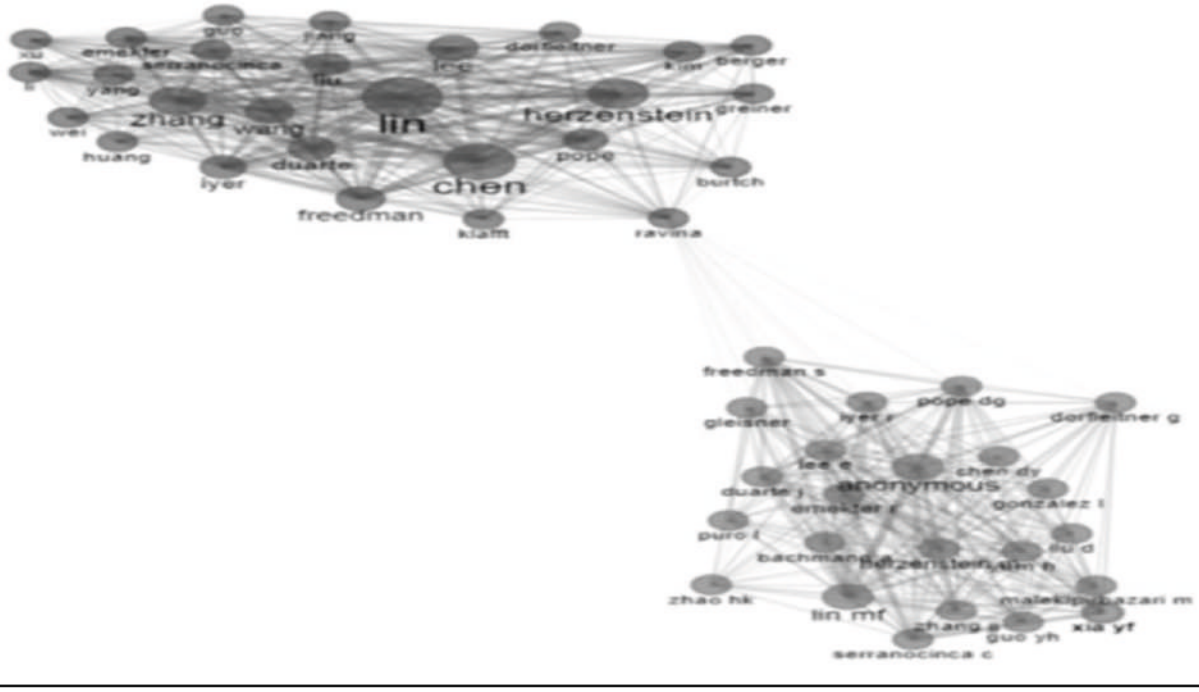
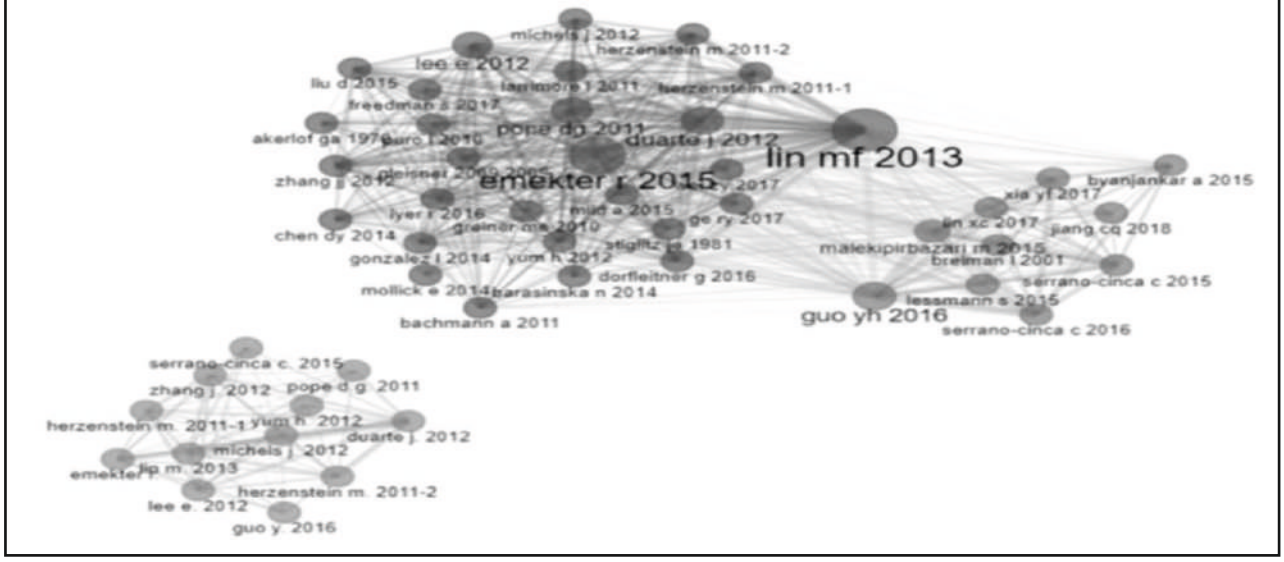


Figure 6. ***Collaborations and the Co-citation Network of Papers***



appearance of trust in P2B lending. Furthermore, Lin et al. (2012) and Bruton et al. (2015) contributed the following highly cited articles, as mentioned in Table 5. These papers contribute to the advancement of P2P lending research.

Figure 5 shows the co-citation network of all the papers that were taken into consideration for this study. The design shows the name of a different author inside each circle. The size of the circle corresponds directly to the author's total number of articles produced on the topic. The co-citation analysis is important to examine the relationship between different works (Ubgade & Joshi, 2022). The intersection visualization of the co-citation

network of articles is displayed in Figure 6. The stronger the bibliographic connections between the writers, the closer they are to the image's center. There are two color groups, as indicated by the authors' networked visualization (dark and light gray).

Major Countries and Author Affiliations

Several countries are mentioned in the chosen articles. The top 10 countries by the number of publications are listed in Table 6. The Many Country Publications (MCP) category includes authors who work across national borders; whereas, the Single Nation Publications (SCP) category includes authors who collaborate within a single country. The sum of articles (SCP + MCP) represents the aggregate of works created by both domestic and international authors. With 382 national publications, China is in the first position, accounting for around 30.6% of all published articles (national and worldwide). The USA is second on the list with 103 local papers, making up 8.5% of all publications; Indonesia, the UK, and Korea with SCP values of 85, 38, and 35, respectively.

Table 7 displays the 10 institutions with the highest number of publications. At the top of the list with 32 papers is the Southwestern University of Finance and Economics, followed by Bina Nusantara University with 23 publications. Fudan University is the fourth-ranked university in the world, with 18 publications. With 17 articles

Table 6. ***Country of the Corresponding Author and Scientific Performance***

Country	Articles	SCP	MCP	Freq.	MCP_Ratio
China	429	382	47	0.306	0.11
USA	119	103	16	0.085	0.134
Indonesia	87	85	2	0.062	0.023
United Kingdom	47	38	9	0.034	0.191
Korea	37	35	2	0.026	0.054
India	31	31	0	0.022	0
Germany	24	22	2	0.017	0.083
Italy	22	16	6	0.016	0.273
Australia	18	16	2	0.013	0.111

Note. Single Country Publications (SCP), Multiple Country Publications (MCP).

Table 7. ***Authors with the Most Related Affiliations are Listed by Country and Number of Publications***

Country	Affiliation	Articles	Articles per Country
China	Southwestern University of Finance and Economics	32	145
	Fudan University	18	
	Hefei University Technology	17	
	Renmin University of China	17	
	Tsinghua University	17	
	Tianjin University	16	
	Cent University Finance and Econ.	14	
	Peking University	14	
Indonesia	Bina Nusantara University	23	42
	Universitas Indonesia	19	

apiece, Tsinghua University, Renmin University of China, and Hefei University of Technology tied for the fifth place. Tianjin University is the world's sixth-ranked institution. Cent University Finance and Economics and Peking University are in seventh position with 14 publications each. China's university holds the first position. Indonesia came in second and third places, with two universities. China has done more studies on P2P lending than any other country, according to an analysis of the quantity of articles published there. China leads by a significant margin when the study of the top major institutions' findings is combined, as it has contributed 145 papers to the corpus of research. Indonesia comes in second with 42 publications.

Co-occurrence and Dendrogram Analysis of Keywords

Co-occurrences are very useful for identifying the themes and connections between keywords (Rathi & Kumar, 2023). Our approach involves grouping keywords according to the number and strength of connections they have in order to examine the relevant term co-occurrence network (Figure 7). The distance between the circles indicates the degree of relatedness between each pair of phrases, while the color symbolizes the cluster. A closer distance means a stronger link. To determine what subjects researchers are most focused on, a keyword analysis of the writers was conducted. Because of this, as seen in Figure 7, we established a network of phrase co-occurrences using Biblioshiny, which shows frequently used author keywords. Figure 7 indicates that the most researched topics are "crowdfunding," "fintech," and "peer-to-peer lending." The most often used author keywords are "p2p lending" and "peer-to-peer lending," with 324 and 296 occurrences, respectively. Fintech came in second with 126 instances, and crowdfunding with 88 instances (Table 8). The study yielded a total of 2,228 keywords divided into 10 categories, each indicated by a different color. The authors' study of keywords provides valuable insights. Logistic regression, machine learning, deep learning, big data, and data mining are among the contemporary analysis approaches that are first exposed. The peer-to-peer lending process also highlights the significance of credit risk, default risk, and credit score.

Figure 7. ***Keyword Clustering and Co-occurrence Analysis***

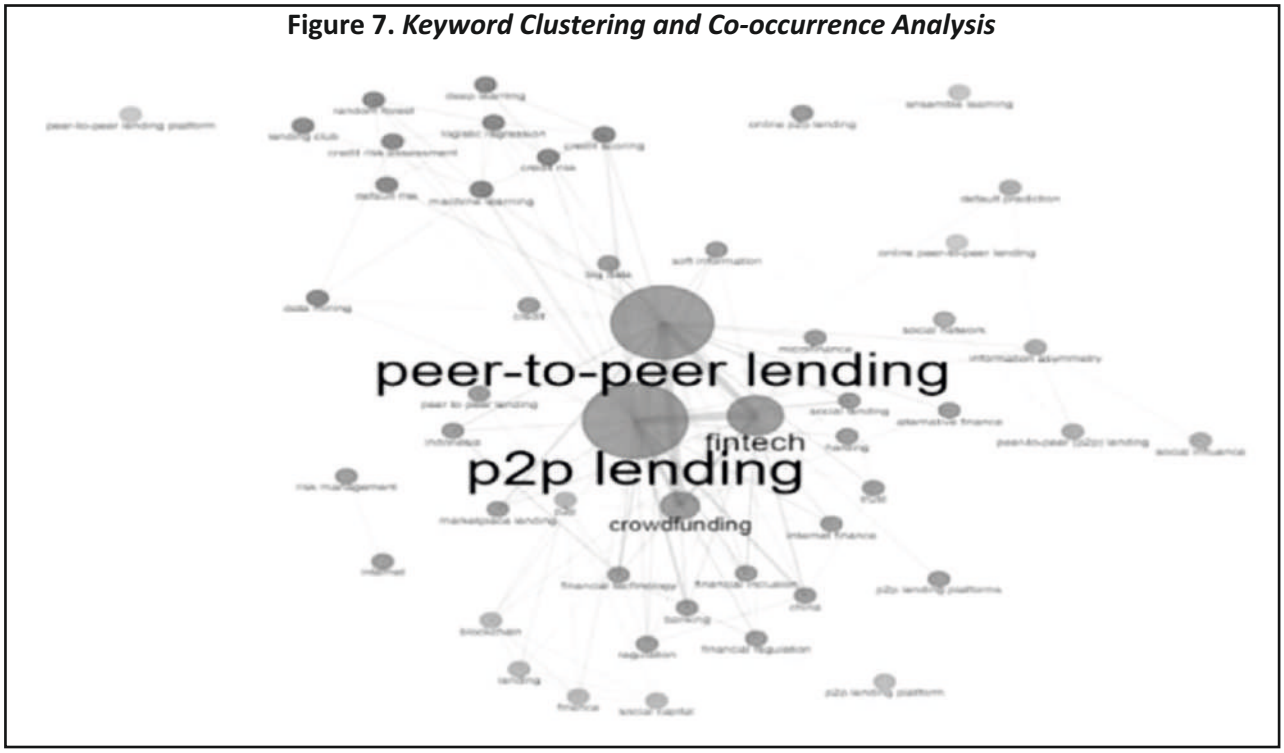


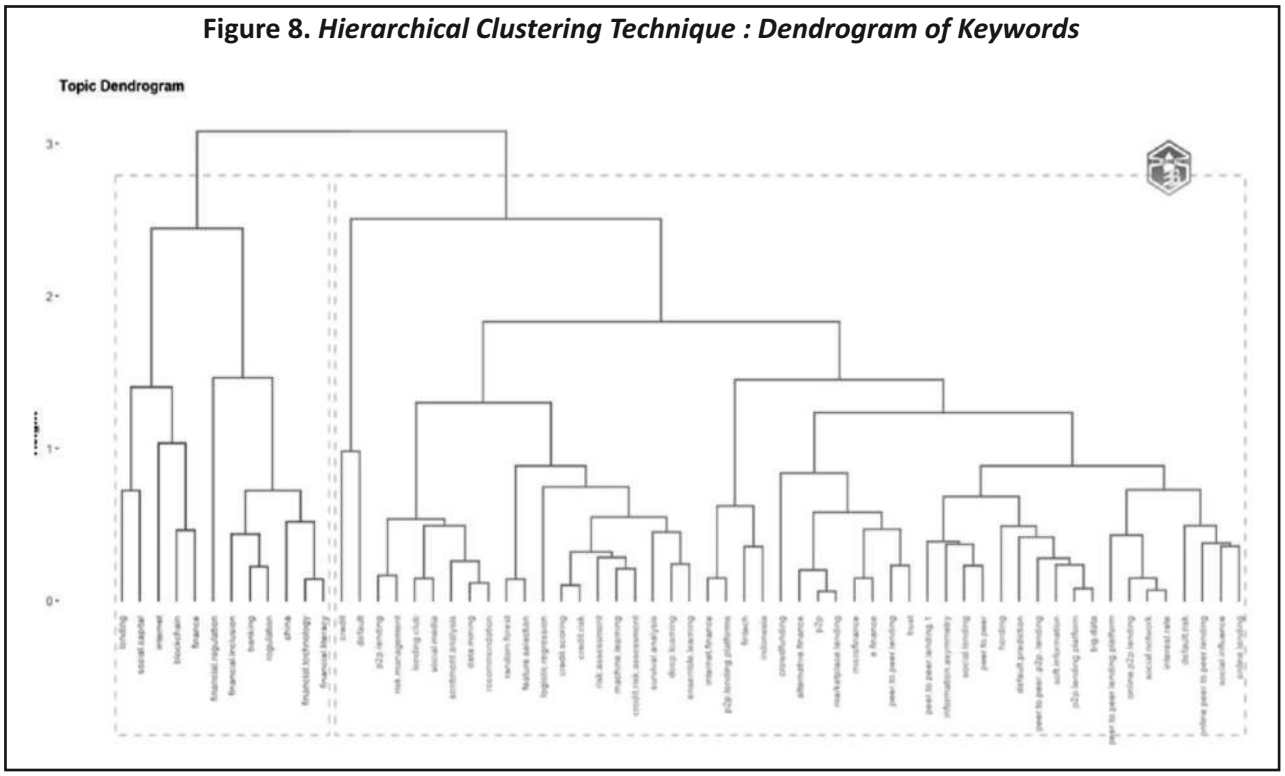
Table 8. ***Top Ten Author Keywords***

Words	Occurrences
P2P Lending	324
Peer to Peer Lending	296
Fintech	126
Crowdfunding	88
Machine Learning	77
Credit Scoring	46
Social Lending	41
Online P2P Lending	39
Information Asymmetry	34
P2P	32

P2P lending is closely associated with fintech and crowdfunding inside a single cluster, as illustrated in Figure 7. Peer-to-peer lending has a close relationship and good correlation with machine learning and data mining as cluster keywords. Within a cluster, there is a substantial correlation between machine learning and credit risk as well as default risk.

The multiple correspondence analysis (MCA) was used to figure out what the different groups meant and to break down the variables into short structural segments of related terms. Two topic clusters are organized in this scenario. Lending is associated with financial technology, financial literacy, the internet, and financial inclusion in the first group. P2P lending is connected to trust, interest rates, social influence, risk assessment, information asymmetry, and credit scoring in the second group (Figure 8).

Figure 8. ***Hierarchical Clustering Technique : Dendrogram of Keywords***



Keyword Analysis

Figure 9 shows that the field of P2P lending has grown significantly over time. This indicates that a lot of researchers are interested in it. P2P lending and information asymmetry are related terms that are becoming more popular. In this figure, we can see that researchers use the term "peer to peer" in two different contexts: P2P and online P2P. Machine learning is one of the major topics in peer-to-peer lending research. Credit scoring is another increasing phase in this study.

Figure 10 shows that P2P lending and information asymmetry are still major subjects in the research

Figure 9. ***Keyword Evolution and Change Throughout Time***

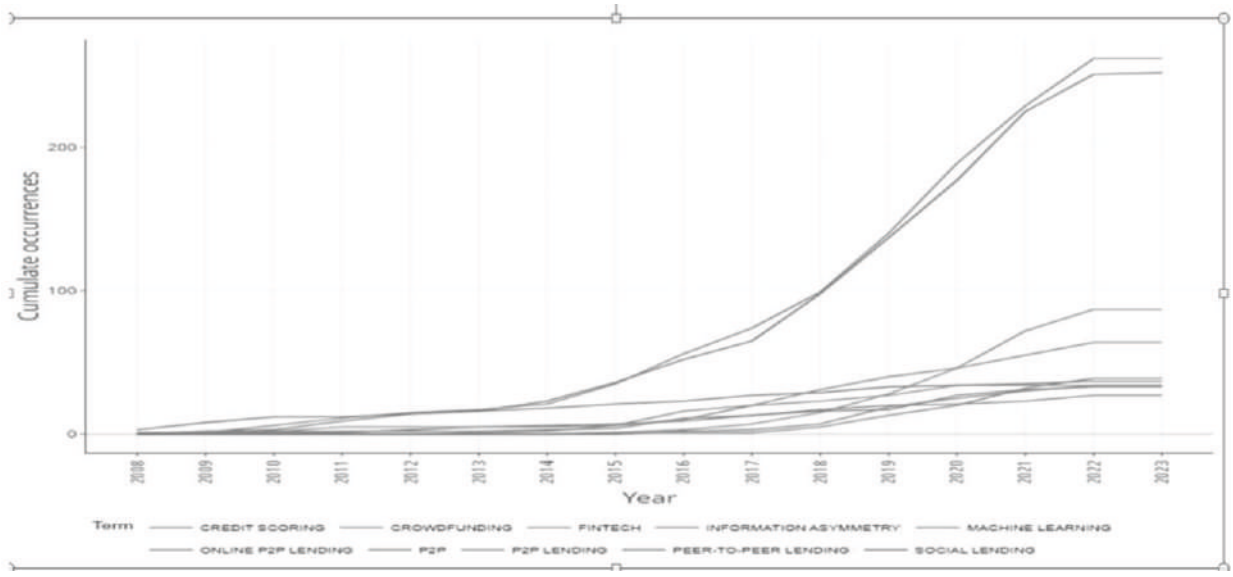


Figure 10. ***Word Map Illustrating the Keywords***

publications analyzed. The keywords "fintech," "crowdfunding," "machine learning," and "credit scoring" predominate in the research publications studied.

Using a two-dimensional coordinate system, they combined network and cluster analysis to determine four distinct groups of themes. These measurements can be used to describe the centrality and density of various subjects. Figures 11(a) and (b) display the motor themes located in the upper right corner. These topics, which

Figure 11(a). ***Strategic Map of the Publications (Authors' Keywords)***

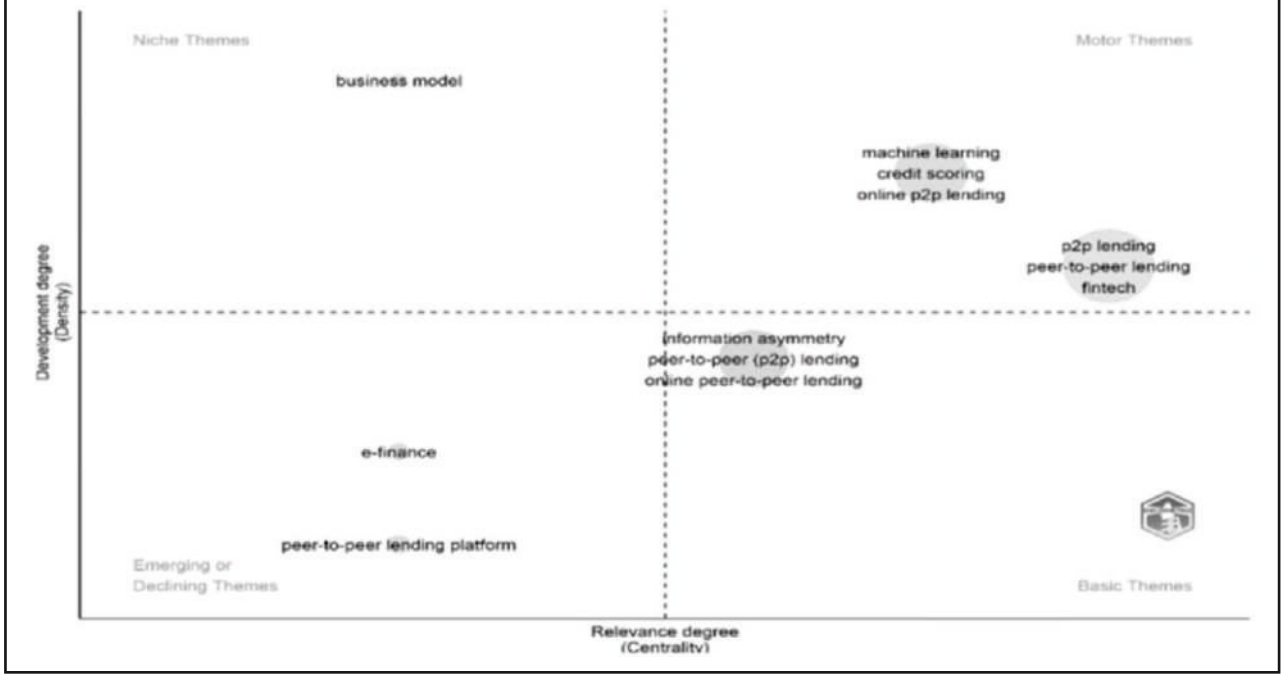
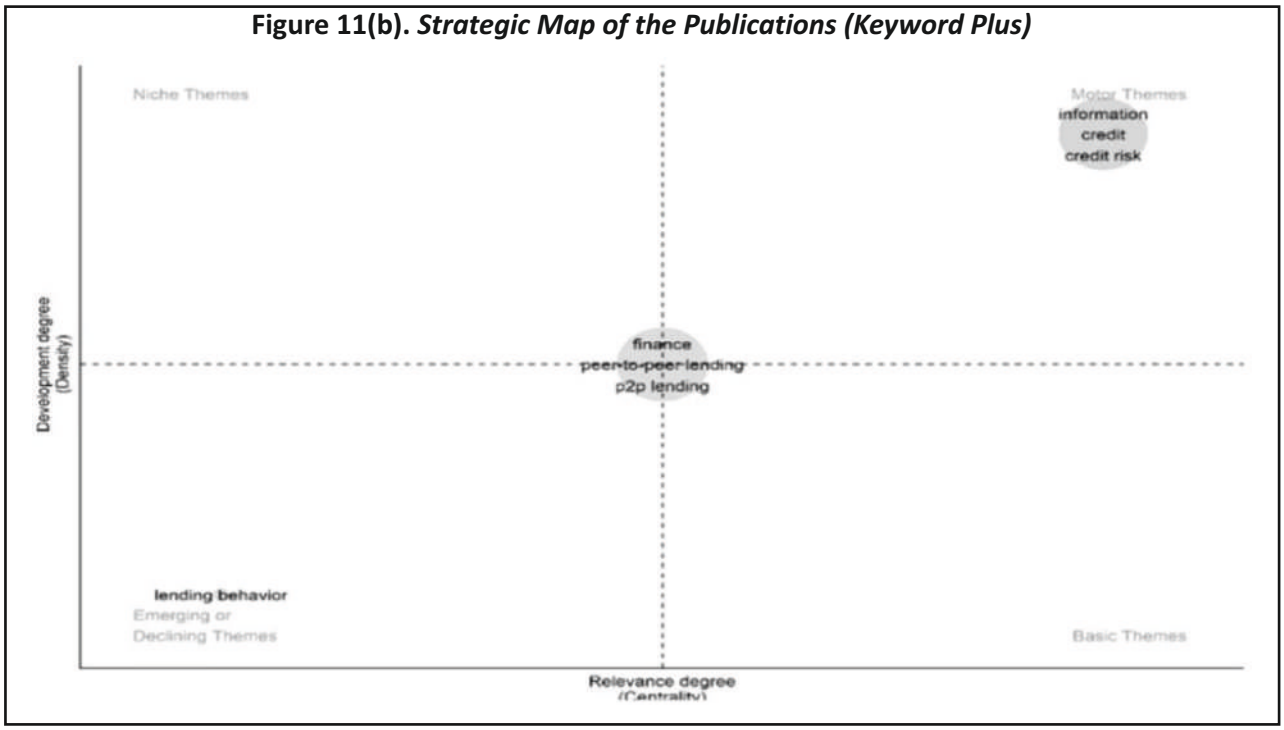


Figure 11(b). ***Strategic Map of the Publications (Keyword Plus)***



have been fully realized and have a strong and extensive relationship with the other themes, form the basis of the search area. The primary subjects shown in the chart's lower right corner will serve as the foundation for the particular publication order. Compared to the other options, these are less dense, but they are highly central. Individuality can coexist with well-developed subjects if they have a low centrality and a high density.

These topics are at the center of a huge debate among intellectuals, even though their contributions are negligible when compared to those of the general population. The combination of low centrality and low density can be useful for identifying themes that are either emerging or decreasing. The line that divides the basic themes from the motor themes is where co-integration is implemented. The driving themes in this case are credit scoring, P2P lending, and machine learning fintech. Platforms for lending and e-finance fall under the emerging or decreasing themes. Lending behavior is classified as either an emerging or declining theme when we use the phrase plus as input.

The connections between countries, author keywords, and references are shown in a three-field plot (Figure 12). The strength of the gray ties in the network represents the degree of interaction between the sections. The larger the lines, the greater the velocities of the recognized objects (Syed et al., 2021). The heights of the rectangle show the frequency with which each of the three elements—country, source, and keyword—occurs. The number of connections is shown by the lines' width joining the rectangles. The number of contacts is high relative to the line thickness. Figure 12 shows that China, the USA, and Indonesia all have more links than any other country. Authors have used the terms "Peer-to-peer lending" and "Fintech" most frequently in a study of reviews. Four primary countries (China, USA, Indonesia, and the UK) and four primary sources (*Finance Research Letters*, *Expert Systems with Applications*, *Electronic Commerce Research and Applications*, and *Financial Innovation*) have strong ties to the main research topics (P2P lending, fintech, crowdfunding, information

Figure 12. ***The Association Between Countries (On the Left), Author Keywords (In the Middle), and Sources (On the Right) is Shown Graphically by a Three-Field Plot***

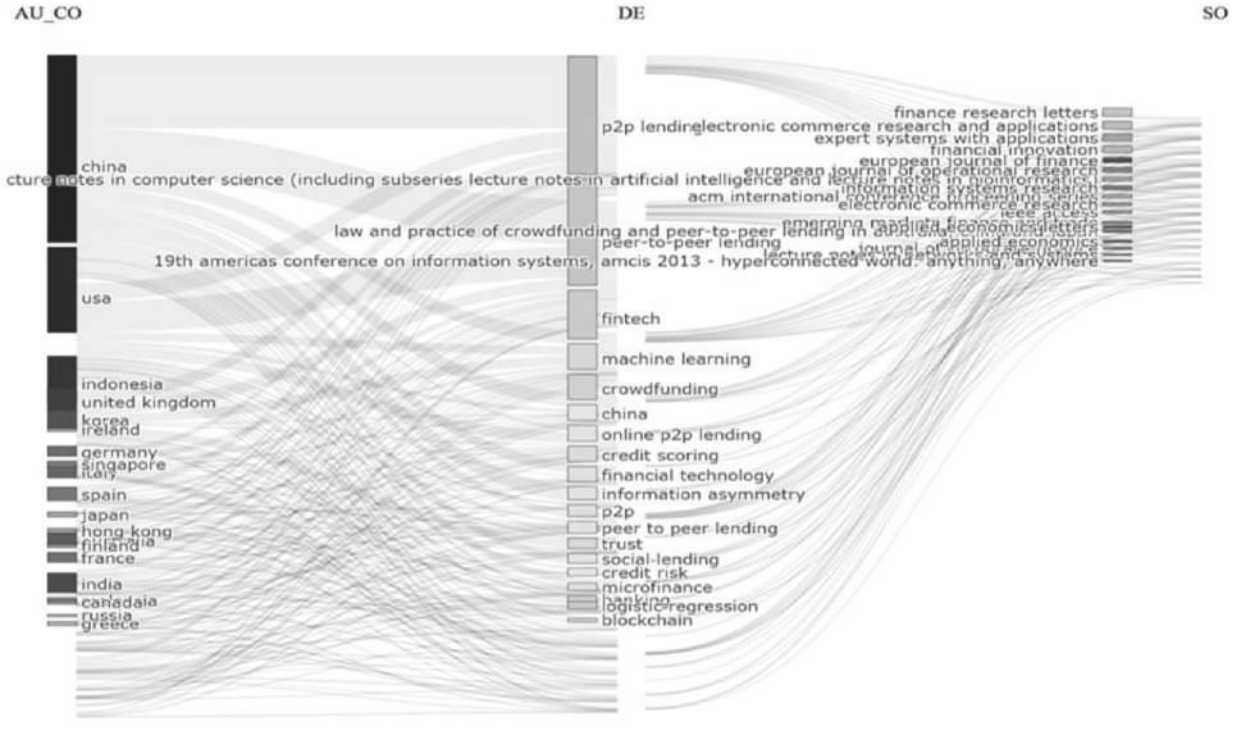
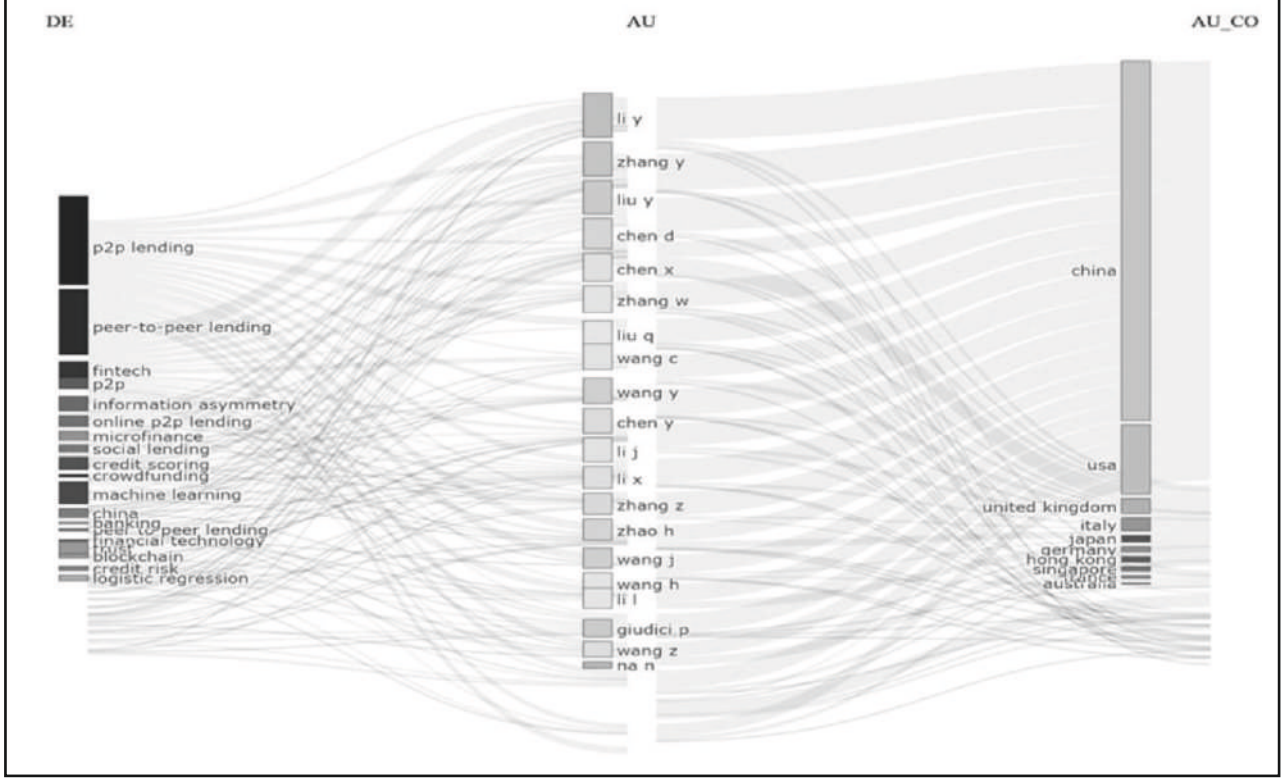


Figure 13. ***The Association among Author Keywords (On the Left), Authors (In the Middle), and Countries (In the Right) is Illustrated Using a Three-Field Plot***



asymmetry, and machine learning). Figure 13 illustrates the correlations between the top author keywords, authors, and nations based on an examination of the main countries, journals, and keyword authors. The writers and nations who write about fintech, credit risk, and P2P lending in a significant percentage of these articles are displayed in this figure. Moreover, Figure 13 validates that LI Y, a Chinese author, has made significant contributions to machine learning applications in the P2P lending context.

Discussion

We have to discuss how the study's findings address the five research topics in this section. The study of the most significant writers on the subject of our investigation was emphasized by the *RQ* (1) findings. Liu Y emerged as the most prolific and important author during the study period, with the highest *h*-index (12) and 25 publications cited 381 times, respectively (Table 4). Chen D and Zhang Y have the second-highest *h*-index (10), with 20 publications cited 516 times and 27 papers cited 282 times, respectively. The top countries contributed the most to the research, and we employed keyword analysis to address our *RQ* (2) at the time of analysis.

China continues to lead the sector with 429 publications, including both domestic and international publications. The United States is next with 119, Indonesia with 87, the UK with 47, and Korea with 37 (Table 6). Based on the study results, China is the leading source of research on P2P lending, with the United States and Indonesia following closely behind. Using the bibliographic information, we created a network map as a solution to *RQ3*. Key P2P lending trends and themes are displayed in this network map. The development of distinct thematic clusters aids in determining the subject area's conceptual organization. Important keyword groupings are

displayed by the biggest circle on the network map, which includes machine learning, credit scoring, fintech, crowdfunding, and P2P lending (Figure 7). With 324 instances, the phrase "p2p lending" is the most often used author keyword in our research, followed by P2P lending (296 occurrences). We may infer that machine learning methods are being applied in P2P lending research since authors used the term "machine learning" 77 times.

In answer to our *RQ* (4), the small size of the collaborative network, with only a few authors working with others, is another significant factor in preserving the links between authors, sources, author keywords, and countries. So, more research is needed to determine what aspects of P2P lending make it interesting to examine. Additionally, the keyword analysis by nation, journal, and author (Figure 12) reveals that the USA, UK, China, and Indonesia are the four most significant countries. Since P2P lending has become more popular in countries like China, Indonesia, and the United States in recent years, most research is focused on these countries. Also, the UK was found to have the strongest overall connection strength of all the countries after China, Indonesia, and the United States. Also, the four principal sources provided (*Finance Research Letters*, *Electronic Commerce Research and Applications*, *Financial Innovation*, and *ACM International Conference Proceeding Series*) are strongly related to the core subject's literature search. In response to our *RQ* (5), it has been observed that credit score and default risk are always included in earlier research materials in P2P lending research, and the keyword machine learning is growing over time.

Managerial Implications

There are several managerial implications to consider. First, managers need to identify key researchers who have made significant contributions in their field. Collaborating with these researchers can provide valuable expertise and insights for decision-making processes, especially in terms of platform optimization and risk management strategies. For example, Liu Y, Chen D, and Zhang Y are recognized as leading researchers in the P2P lending industry. Second, managers should stay informed about industry trends and best practices by engaging with reputable sources. This includes understanding the top journals and highly cited articles in P2P lending research. *Finance Research Letters* and *Electronic Commerce Research and Applications* are examples of reputable sources that can help managers make informed decisions and drive innovation within their organizations. Finally, recognizing thematic trends such as fintech, crowdfunding, and machine learning is crucial for managers in anticipating shifts in industry dynamics. Managers can use theme cluster findings to guide P2P lending platform product development, customer interaction tactics, and risk mitigation initiatives.

Conclusion

This is, to the best of our knowledge, the first bibliometric study to investigate P2P lending research. We found that credit rating and default risk receive the majority of study attention. In most of the authors' analyses, machine learning techniques are used. Surprisingly, most authors included China as one of their author keywords, indicating that most research on P2P lending was done in China. The term "machine learning" is new. Our observations indicate that the majority of research focuses on the P2P lending mechanism, with relatively little research from the customer perspective.

Limitations of the Study and the Way Forward

The Scopus and WoS databases served as the primary focus of this investigation; however, subsequent research could look into other research databases, including Dimensions, the Cochrane Library, and PubMed. Future research could also go toward creating a visualization tool that provides a clear visualization of the original report

and functions in multiple dimensions. Future studies should look into a wide range of other unique and state-of-the-art technologies related to machine learning for bibliometric analysis. One of these methods is cluster prediction, which determines a topic's popularity based on its ranking.

Authors' Contribution

Dr. Madhusmita Mohanty supervised the research process to ensure its excellence and validity. She oversaw the research, confirmed the analytical procedures, and contributed her extensive understanding of bibliometric analysis techniques. Sarasanabelli Prasanna Kumari gathered data and reviewed relevant literature. *R* programming was used to examine the data for bibliometric analysis; the results were evaluated, and the analysis was added to the article.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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