



Review

# What Do We Know about Crowdfunding and P2P Lending Research? A Bibliometric Review and Meta-Analysis

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**Abstract:** In the era of fintech, businesses using technology other than traditional banks are providing financial services. Crowdfunding and peer-to-peer (P2P) lending are two of the most exciting financial innovations of the twenty-first century. In this paper, we use a bibliometric review and meta-analysis to understand the academic research on crowdfunding and P2P lending. Our findings show that the research on this topic has grown a lot in terms of publications since 2013 and the maximum mean total citations were observed in the year 2014. We provide the details about the most influential authors based on total citations, authors with the greatest number of publications, the most influential documents, significant journal sources, highest single country production, multiple country production, and important affiliations. We further apply the network analysis and visualisation techniques wherein we provide the details of the citation analysis of documents, co-citation analysis of authors, and co-occurrence analysis of author keywords. Finally, we provide the future directions of the research on this burgeoning topic.

**Keywords:** crowdfunding; P2P lending; bibliometric analysis; meta-analysis



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## 1. Introduction

Fintech-based financial innovation took to the center stage after the global financial crisis of 2008 as people started showing more faith in the financial innovation (Flögel and Beckamp 2020; Suri et al. 2021). It started as a wave and completely transformed the outlook of the financial landscape in terms of promise, delivery, payment, customer engagement, and customer service (M. Khan et al. 2022; Rabbani et al. 2021d). The fintech-based financial innovations include the use of different technologies in the delivery of financial services such as artificial intelligence (Rabbani et al. 2021b), big data (Sun et al. 2020), blockchain (Rabbani 2022; Rabbani et al. 2021c), digital banking (Jünger and Mietzner 2020; Payne et al. 2018), digital payment/wallets (S. Khan and Rabbani 2021), regtech and insuretech (Rabbani et al. 2021e), and crowdfunding and P2P lending (Ellman and Hurkens 2019).

Crowdfunding and P2P lending are two of the most exciting financial innovations of the twenty-first century along with digital banking and cryptocurrency (Hörisch 2019; Perez et al. 2020). They are innovative forms of finance that raise funds from a large pool of people via online platforms (Rose et al. 2021; Zhao et al. 2019). They are most often used by start-up companies and growing businesses to finance their operations as a way of sourcing alternative funds (T. Kim et al. 2017). The success of crowdfunding and P2P lending is highly influenced by the digitisation of society and the availability of the internet (Lau and Chew 2016). They gained momentum after the global financial crisis of 2008, as borrowers and investors lost faith in traditional banking and were looking for an alternative to raise/lend money (Butticé et al. 2019; Calic and Shevchenko 2020). Recently, they have also received considerable attention from academic researchers and practitioners. The

interest of the researchers is expected to continue and intensify in the time to come; hence, the provocation of the present study.

The phrases “crowdfunding” and “P2P lending” are sometimes confused and assumed to be the same, since both financial innovations, through digital platforms as an intermediary, involve people banding together to provide financial support to entrepreneurs or small- and medium-sized businesses that would not otherwise have attracted the attention of traditional banks (Oberoi et al. 2022; F. Xu et al. 2022). It is crucial to realise that both are unique; in reality, P2P lending is a subset of the crowdfunding type of financial innovation (Kuo et al. 2020).

The primary types of crowdfunding are three. The first is reward-based crowdfunding, where investors' main goal is to help a project thrive without expecting any money rewards and instead choose to earn gratitude in the form of a gift or a token (Chen 2022). The second type of crowdfunding is donation-based, where investors contribute tiny amounts of money in exchange for supporting a project without expecting a tangible return (Attuel-Mendes et al. 2021). The third type of crowdfunding is equity-based, where the investors anticipate receiving an equity stake in the project. This type of investment is riskier because the investors could lose everything if the project or start-up company fails, while they could profit greatly if the project succeeds (M. Kim and Hall 2019).

P2P lending, on the other hand, is a sort of debt-based crowdfunding where investors' capital is linked, via an internet website, to a loan for an individual or company rather than ownership in a business (Hsu et al. 2021). As a return on their investment, investors receive interest, and at the end of the term, they also receive their principal. P2P lending through digital platforms is flexible and less restrictive than traditional banking, and because of this, it attracts early-stage start-ups and projects that would not otherwise be able to raise money. In comparison to equity-based crowdfunding, debt-based crowdfunding has lower risks for investors but lower returns. Moreover, because the investor is long-term, crowdfunding might be seen as an investment (Klein et al. 2021).

Although financial innovations such as crowdfunding and peer-to-peer lending are becoming more and more popular lately, they are not risk-free. The risks associated with crowdfunding include limited liquidity, fraud, and equity dilution in addition to the danger of the venture or start-up business failing (Rosavina et al. 2019). In the case of P2P lending, investors incur risks such as defaulting on periodic interest payments, concentration risk, and failure to receive the principal amount, even though the returns are lower than those of equity-based crowdfunding (Hornuf and Schwienbacher 2017; D. Xu and Ge 2017).

Traditional business models and risk management have altered and become more digitised because of the growth of the innovative financial market and business process. To safeguard the funds of the investors and borrowers, regulators must issue guidelines to the platforms for P2P lending and crowdfunding (Cummings et al. 2020; Schwienbacher 2019). The platforms should have sufficient risk management measures as part of the business continuity strategy, preserve all players' data, provide transaction transparency, and have a suitable appeals process. Although P2P lending and crowdfunding have many advantages, these services are provided through online marketplaces; thus, it is essential to confirm the legitimacy and dependability of the website before dealing (D. Xu and Ge 2017).

The present study analyses the crowdfunding and P2P lending research, trend over the years, core area, most prolific authors contributing to the field, most prolific institutions, and provides future research directions. The paper specifically analyses why and how the concepts of crowdfunding and P2P lending have emerged from the fintech literature, which concepts and subject lines have evolved over the years, and what the direction of the research in the years to come would be. To answer the above questions, the study conducted a bibliometric review and meta-analysis by analysing 1742 crowdfunding and P2P lending research papers downloaded from the Scopus database.

In the next section of this paper, we discuss the data and methods used in this study. The section is followed by the section on results and discussion. We finally provide a section on conclusion and future directions of research.

## 2. Data and Methods

The data had been retrieved from the Scopus database using an appropriate Boolean mix of keywords on crowdfunding and P2P lending. The Scopus database is considered to have an enormous number of quality articles, especially in the streams of social sciences (Pan et al. 2020). A combination of most generic keywords pertaining to the field of crowdfunding, i.e., ((crowdfunding) OR (equity crowdfunding) OR (crowdsourcing) OR (peer-to-peer lending) OR (P2P Lending) OR (crowdfunding) OR (crowd funding) OR (online sourcing)) was used. These keywords were entered into TITLE-ABS-KEY tab of the Scopus article search interface. The data were extracted in the month of February, so they include all the articles published by February 2022. This step returned 3456 articles, which were then screened for journal articles and articles written in the English language. This criterion filtered out 1127 works of the literature, and 2329 articles remained. Then, the title and abstract of all articles were carefully investigated by the researchers to make sure that the works of the literature were aligned with the central subject of crowdfunding-related research. Several data cleaning processes (such as that conducted by Bashar et al. 2021a) were conducted to find any coding errors, missing author names, etc. This examination further excluded more works, and a total of 1742 articles were found to be suitable for further consideration and analysis.

This study employs a bibliometric analysis for reviewing the past, looking critically at present status and probable future directions for expansion of knowledge in the domain of crowdfunding (Naeem et al. 2022). Bibliometric analysis is considered one of the most comprehensive reviewing techniques which fills all the gaps in traditional review research studies by presenting a mesmerising scientific visualisation (A. Khan et al. 2021; Rabbani et al. 2021a; Singh and Bashar 2021).

This research employs two steps of analysis of bibliometric data. The first step is the representation and discussion of descriptive analysis which helps to estimate the past and current status of the research on crowdfunding. The next step is the visual representation of co-citations, citations, and co-occurrence analysis, which helps to visualise the major streams and intellectual structure in the field of crowdfunding research.

For descriptive analysis, the Biblioshiny application was used. It is considered a valuable tool to look at the scientific landscape of a particular area of research, allows the visualisation of data through graphs and tables, and the results can be extracted in various formats for further analysis and presentation. The network mapping of the scientific literature in the field of crowdfunding and P2P lending was carried out using the VOSviewer software application. VOSviewer is a comprehensive tool for the visualisation of network maps based on co-citations, citations, and co-words, analysis, etc., which helps in the understanding of the social and intellectual structure of the research (Bashar et al. 2021b; Hassan et al. 2022; Singh and Bashar 2021).

## 3. Descriptive Analysis

The following section is the analysis results of the descriptive statistics of the research in crowdfunding and P2P lending.

### 3.1. Main Information about Data

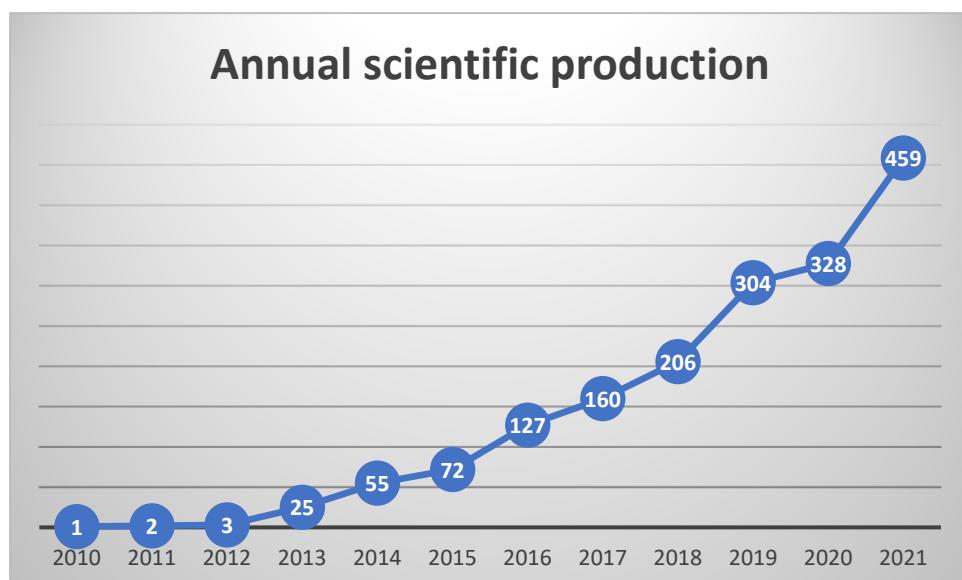
The following Table 1 describes the main characteristics of the data. The sample data in this study were collected for the time span of 2010 to 2021 and found 1742 documents consisting of 1655 articles and 87 review studies which were published by 851 journals. These documents were written by 3504 authors; there are only 292 documents found which were single-authored, and the rest of all documents were written in collaboration. This shows the importance of the research and its connectedness globally with fellow researchers. The co-author per document was found to be 2.77, which leads to a collaboration index of 2.27 in the research of crowdfunding and P2P lending.

**Table 1.** Data characteristics.

Description	Results
Timespan	2010:2021
Sources (journals, books, etc.)	851
Documents	1742
Average citations per document	18.49
Average citations per year per doc	3.349
References	83,817
Article	1655
Review	87
Keywords plus (ID)	3430
Author's keywords (DE)	4118
Authors	3504
Authors of single-authored documents	292
Authors of multiauthored documents	3212
Single-authored documents	327
Documents per author	0.497
Authors per document	2.01
Co-authors per document	2.77
Collaboration index	2.27

### 3.2. Production Trends

The following Figure 1 illustrates the state of publishing in the research area of crowdfunding and P2P lending. It can be noticed that there was not much attention on this area of research in the early 2010s, but it started increasing from 2013 onwards and saw a sharp increase in the year 2017 onwards, and finally, the area has seen tremendous growth in the last three years. This shows the importance of crowdfunding in recent days' research agenda. The first empirical article on crowdfunding was published in 2010 ([Freund 2010](#)). From then, it started evolving across other streams and disciplines such as entrepreneurship, econometrics, computer science, and government regulations. Crowdfunding research spread to other disciplines because it is considered to be a form of online sourcing which is a subdomain of computer science research that deals with the development and management of web portals for the sourcing of funds ([Ortiz Zebbatti et al. 2012](#); [Steininger et al. 2014](#)). Moreover, the regulation of crowdfunding leads to the regulations of the government to govern the proper fraud-free P2P lending and sourcing ([Bashar 2014](#); [Fabus et al. 2015](#); [Morse 2015](#)).

**Figure 1.** Annual scientific production.

The annual citations of the articles published on crowdfunding research are presented in Table 2. The mean total citations per article and mean total citations of articles per year along with the number of citable years are presented. The year 2014 witnessed the maximum mean total citations, followed by 2015, while the same year, 2014, has a mean total citations value of 91. It is interesting to note that the mean total citations have been decreasing in the last four years regarding the crowdfunding research literature.

**Table 2.** Annual citations trends.

Year	No. of Papers	Mean Total Citations per Articles	Mean Total Citations per Year	Citable Years
2010	1	3	0	12
2011	2	82	7	11
2012	3	42	4	10
2013	25	65	7	9
2014	55	91	11	8
2015	72	59	8	7
2016	127	36	6	6
2017	160	32	6	5
2018	206	23	6	4
2019	304	11	4	3
2020	328	6	3	2
2021	459	2	2	1

### 3.3. Prolific Authors

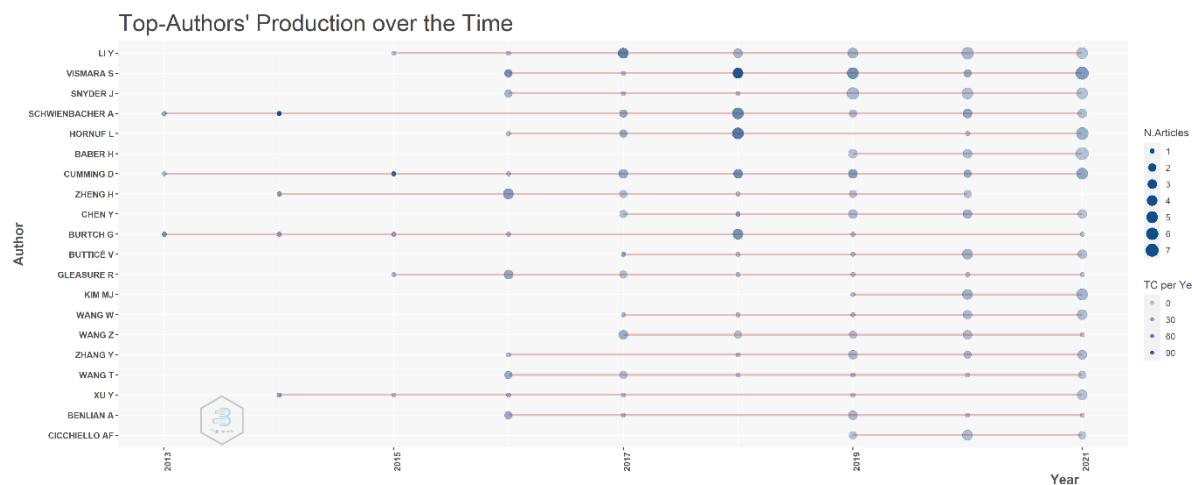
The following Table 3 shows the impact of authors based on their total citations. A list of the 20 most influential authors is presented with their h-index, m-index, g-index, total citations, and number of papers. The author Mollick, E is the top author, having published only four articles, but his articles have attracted 2188 citations in a short span of 7 years. Schwienbacher, A is the second most important author and his 16 articles have been cited 1853 times, while Belleflamme, P with three papers and 1488 citations is placed at number three. The other authors have also contributed significantly to the development of crowdfunding research, as can be seen in Table 3.

**Table 3.** The most important authors by total citations (TC).

Element	h_index	g_index	m_index	TC	NP	PY_start
MOLLICK E	4	4	0.4	2188	4	2014
SCHWIENBACHER A	11	16	1.1	1853	16	2013
BELLEFLAMME P	3	3	0.3	1488	3	2013
VISMARA S	15	20	2.1	1285	20	2016
LAMBERT T	2	2	0.2	1277	2	2013
BURTCH G	9	10	0.9	1145	10	2013
CUMMING D	10	11	1.0	1069	11	2013
GHOSE A	5	5	0.5	928	5	2013
GOLDFARB A	5	5	0.6	910	5	2014
WATTAL S	4	4	0.4	887	4	2013
AGRAWAL A	4	4	0.4	869	4	2014
CATALINI C	4	4	0.4	869	4	2014
COLOMBO MG	5	5	0.6	861	5	2015
SCHWEIZER D	3	3	0.4	784	3	2015
ROSSI-LAMAstra C	6	7	0.6	764	7	2013
AHLERS GKC	1	1	0.1	709	1	2015
GÜNTHER C	1	1	0.1	709	1	2015
DAVIS BC	4	4	0.5	704	4	2015
WEBB JW	4	4	0.5	704	4	2015
SHORT JC	6	8	0.75	670	8	2015

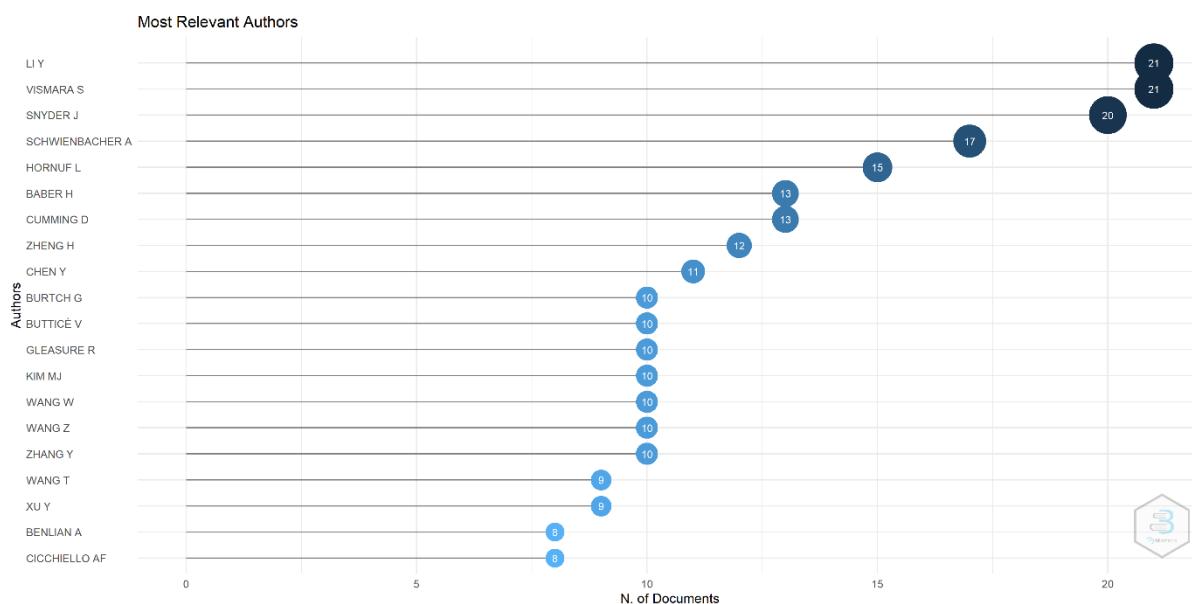
Note: h-index, g-index, and m-index are the measures of author productivity and citations of their published work. TC—total citations; NP—no. of papers; PY Start—publication start year.

The publications of the authors over the period are depicted in Figure 2; the size and colour of the nodes represent the number of articles and the total number of citations over the period. It is interesting to notice that few authors started publishing recently, and their work has been recognised and cited in related studies. The most consistent authors over the period are Schwienbacher, A; Cumming, D; and Burtsch, G, who have been publishing continuously from the beginning of the exposition of the research in crowdfunding and P2P lending. It is also worthy to note that authors who started researching in crowdfunding are consistent and work continuously for the development of the research streams.



**Figure 2.** Authors' publications.

The authors who have published the maximum number of papers and their ranking are depicted in Figure 3. Li, Y and Vismara, S are the most prolific authors, and both have published 21 research papers on crowdfunding and P2P lending research. The author ranked next to them is Synder J, having published 20 research articles. The other authors are shown with their number of papers in the following Figure 3.



**Figure 3.** Authors' number of publications.

### 3.4. Most Significant Papers

The most important documents are shown in Table 4; this table consists of author, title, source/journal, year of publication, local citations, global citations, and ratio of local and

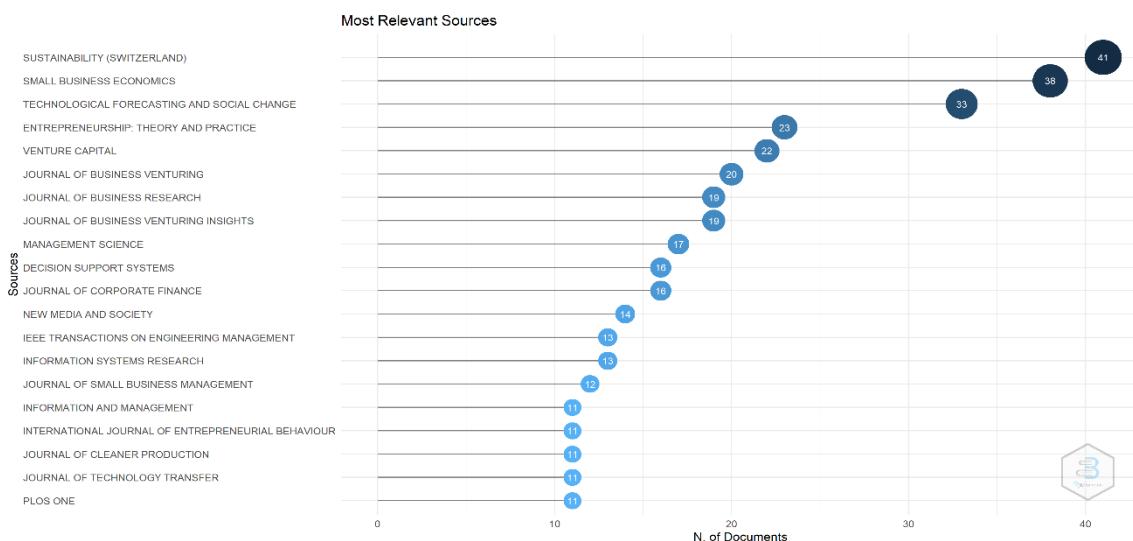
global citations. Local citations are counted as being from within the sample articles, while global citations are the total citations an article receives globally. The best document is found in “A systematic literature review of crowdfunding and sustainability: highlighting what really matters”, which was published in the *Journal of Business Venturing* in the year 2014. This article is ranked first and has been cited 825 times locally and 1675 times globally. It shows the importance of crowdfunding and the recent deliberations by scholars around the world. The second most important document is “Crowdfunding: Tapping the right crowd”, having attracted 574 local citations and 1055 global citations. This research was also published in the *Journal of Business Venturing* in 2014. The next article in the ranking roster was “Signalling in equity crowdfunding”, published in 2015, and has attracted significant local and global citations (LC-410, GC-709). It is worthy to note that all three top-notch documents on crowdfunding are pertaining to crowdfunding research in entrepreneurship and business venturing. So, crowdfunding research shall be looked at in close proximity to business start-ups and early-business financing.

**Table 4.** The most influential documents.

Author	Title	Source	Year	Local Citations	Global Citations	LC/GC Ratio (%)
MOLLICK E	A systematic literature review of crowdfunding and sustainability: highlighting what really matters	<i>Journal of Business Venturing</i>	2014	825	1675	49.25
BELLEFLAMME P	Crowdfunding: tapping the right crowd	<i>Journal of Business Venturing</i>	2014	574	1055	54.41
AHLERS GKC	Signalling in equity crowdfunding	<i>Entrepreneurship Theory and Practice</i>	2015	410	709	57.83
COLOMBO MG	Internal Social Capital and the Attraction of Early Contributions in Crowdfunding	<i>Entrepreneurship Theory and Practice</i>	2015	273	480	56.88
AGRAWAL A	The geography of crowdfunding	<i>Journal of Economic Management and Strategy</i>	2015	250	422	59.24
BURTCH G	An empirical examination of the antecedents and consequences of contribution patterns in crowd-funded markets	<i>Information Systems Research</i>	2013	218	462	47.19
AGRAWAL A	Some simple economics of crowdfunding	<i>Innovation Policy and the Economics</i>	2014	200	367	54.50
GERBER EM	Motivations for crowdfunding: what drives the crowd to invest in start-ups?	<i>Computer Human Interaction (Con)</i>	2013	192	388	49.48
ZHENG H	The role of multidimensional social capital in crowdfunding: A comparative study in China and US	<i>Information &amp; management</i>	2014	176	292	60.27
VISMARA S	Equity retention and social network theory in equity crowdfunding	<i>Small Business Economics</i>	2016	170	277	61.37

### 3.5. Prominent Sources of Publication

The most influential documents in the research of crowdfunding and P2P lending are presented in the following Figure 4. *Sustainability* (Switzerland) is the most contributing journal with the publication of 41 articles. This journal is publishing actively in almost every domain and subdomain of crowdfunding research, such as small business venturing, entrepreneurship, computer science, and allied subjects.



**Figure 4.** Most relevant sources (number of documents).

The journal *Small Business Economics* is placed in the second rank, with a publication score of 38 papers. This journal mainly publishes articles related to small business financing, and the use of crowdfunding and crowdsourcing has been the central theme of the papers published in this journal. The journal *Technological Forecasting and Social Change* is the next in the chart and has published 33 articles. This journal publishes studies on the use of technological platforms, mainly web portals, to run crowdfunding campaigns and related technological modelling.

The detailed relevance and importance of the sources in the crowdfunding and P2P research are shown in the below Table 5. This table has ranked articles based on the total number of citations. The other metrics, such as h-index, g-index, m-index, and the number of papers, are also represented for a better understanding of the impact of these journals on crowdfunding research.

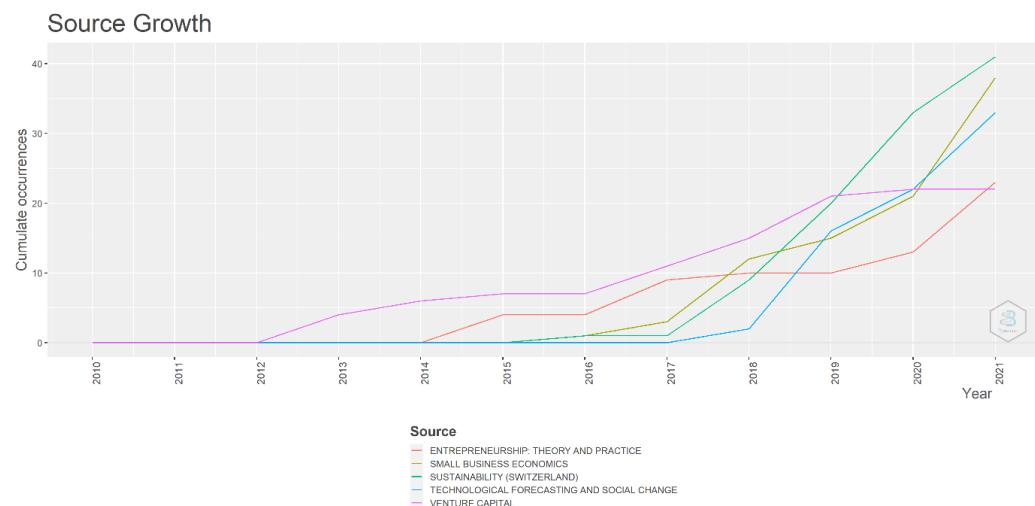
The *Journal of Business Venturing* is the top-ranked journal in terms of total citations (4144); this journal started publishing in the year 2014 and has published 20 articles. In a short span of 7 years, it has achieved an h-index of 18, a g-index of 20, and an m-index of 2. This result is in great confirmation of the results found in the section on several documents. The source *Entrepreneurship: Theory and Practice* is ranked second, with 2799 total citations, and has published 23 articles, while the journal *Small Business Economics* has been cited 1600 times and placed in third, with 35 articles. So, a journal may have a greater number of published papers but may not be very influential if it has not attracted enough citations.

The growth of the sources over time is presented in the above Figure 5. There were very few sources before 2014–15; after 2014, new sources, such as *Small Business Economics*, *Sustainability*, *Technological Forecasting and Social Change*, and *Venture Capital*, started publishing actively about crowdfunding research. Almost all the sources have seen the positive increase in the number of articles that they are producing over time. The recent trends show that these journals will keep publishing important aspects of crowdfunding research, and new sources will also be added in the future.

**Table 5.** The most influential sources.

Journals	<b>h_index</b>	<b>g_index</b>	<b>m_index</b>	TC	NP	PY_start
<i>JOURNAL OF BUSINESS VENTURING</i>	18	20	2.0	4144	20	2014
<i>ENTREPRENEURSHIP: THEORY AND PRACTICE</i>	11	23	1.4	2799	23	2015
<i>SMALL BUSINESS ECONOMICS</i>	20	35	2.9	1600	35	2016
<i>MANAGEMENT SCIENCE</i>	12	17	1.5	1263	17	2015
<i>VENTURE CAPITAL</i>	13	21	1.3	1203	21	2013
<i>JOURNAL OF BUSINESS RESEARCH</i>	12	18	1.7	688	18	2016
<i>INFORMATION SYSTEMS RESEARCH</i>	7	12	0.7	638	12	2013
<i>TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE</i>	15	23	3.0	595	31	2018
<i>DECISION SUPPORT SYSTEMS</i>	9	15	1.3	567	15	2016
<i>CALIFORNIA MANAGEMENT REVIEW</i>	9	9	1.3	530	9	2016
<i>INFORMATION AND MANAGEMENT</i>	6	9	0.7	516	9	2014
<i>RESEARCH POLICY</i>	7	10	1.2	432	10	2017
<i>JOURNAL OF ECONOMICS AND MANAGEMENT STRATEGY</i>	2	2	0.3	425	2	2015
<i>NEW MEDIA AND SOCIETY</i>	12	13	1.5	415	13	2015
<i>ACM TRANSACTIONS ON COMPUTER-HUMAN INTERACTION</i>	2	2	0.2	394	2	2013

Note: h-index, g-index, and m-index are the measures of author productivity and citations of their published work. TC—total citations; NP—no. of papers; PY Start—publication start year.

**Figure 5.** Source growth in the research domain of crowdfunding.

### 3.6. Countries Publishing on Crowdfunding and P2P Lending

The list of 20 influential countries along with their total number of publications, total citations, and their average article citation is presented in Table 6. The USA is the top country, with 239 articles published, and attracted 6363 total citations, which amounts to average article citations of 26.62. Italy and France are second and third most important countries, with 2430 and 1735 citations, respectively. France has published only 41 articles, but their articles have been cited 1735 times with an average article citation score of 42.32.

**Table 6.** The most influential countries.

Country	Number of Papers	Total Citations	Average Article Citations
USA	239	6363	26.62
ITALY	89	2430	27.30
FRANCE	41	1735	42.32
CHINA	190	1701	8.95
CANADA	48	1665	34.69
GERMANY	76	1574	20.71
UNITED KINGDOM	76	1543	20.30
SPAIN	47	606	12.89
NETHERLANDS	25	386	15.44
FINLAND	9	382	42.44
BELGIUM	7	319	45.57
KOREA	46	312	6.78
IRELAND	21	298	14.19
AUSTRIA	4	243	60.75
AUSTRALIA	19	216	11.37
INDIA	17	183	10.77
ISRAEL	11	172	15.64
SWEDEN	9	164	18.22
LIECHTENSTEIN	7	135	19.29
BRAZIL	10	123	12.30

The collaboration of authors around the globe researching crowdfunding and P2P lending is depicted with the help of Table 7 and Figure 6. The USA has produced the highest number of articles written by single-country authors. Out of the total 239 articles produced by USA, 197 articles, which amounts to 82% of their total production, are single-country, while only 42 articles are multiple-country authored. The USA scholars are actively researching the various aspects of crowdfunding and P2P lending and are not collaborating much with other colleagues globally.

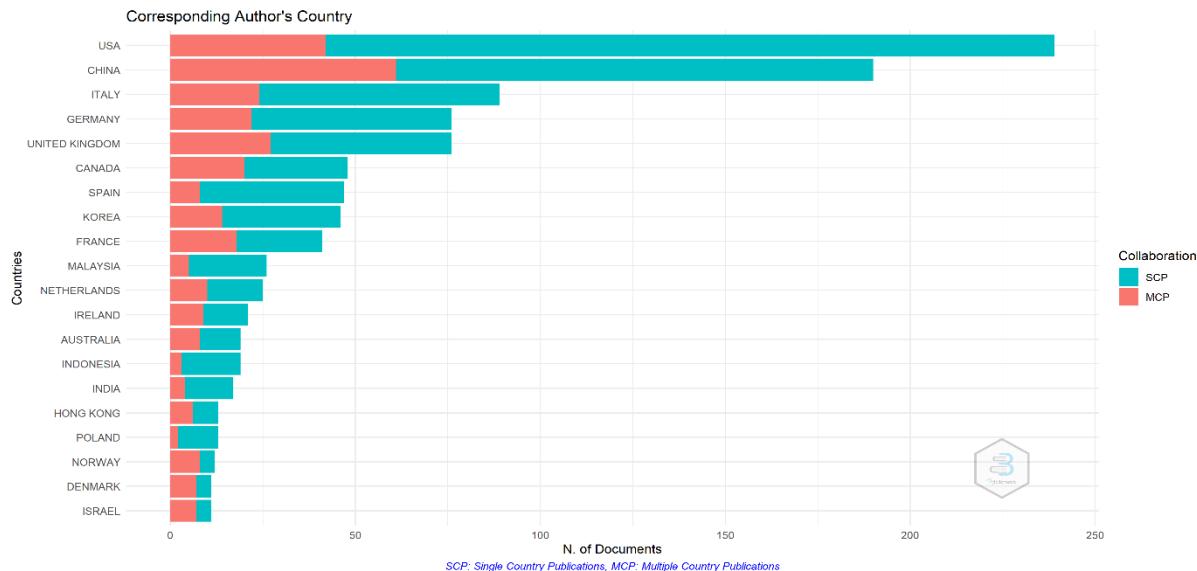
**Table 7.** The collaboration of countries.

Country	Articles	SCP	MCP
USA	239	197	42
CHINA	190	129	61
ITALY	89	65	24
GERMANY	76	54	22
UNITED KINGDOM	76	49	27
CANADA	48	28	20
SPAIN	47	39	8
KOREA	46	32	14
FRANCE	41	23	18
MALAYSIA	26	21	5
NETHERLANDS	25	15	10
IRELAND	21	12	9

**Table 7.** Cont.

Country	Articles	SCP	MCP
AUSTRALIA	19	11	8
INDONESIA	19	16	3
INDIA	17	13	4
HONG KONG	13	7	6
POLAND	13	11	2
NORWAY	12	4	8
DENMARK	11	4	7
ISRAEL	11	4	7

Note: SCP—single country production; MCP—multiple country production.

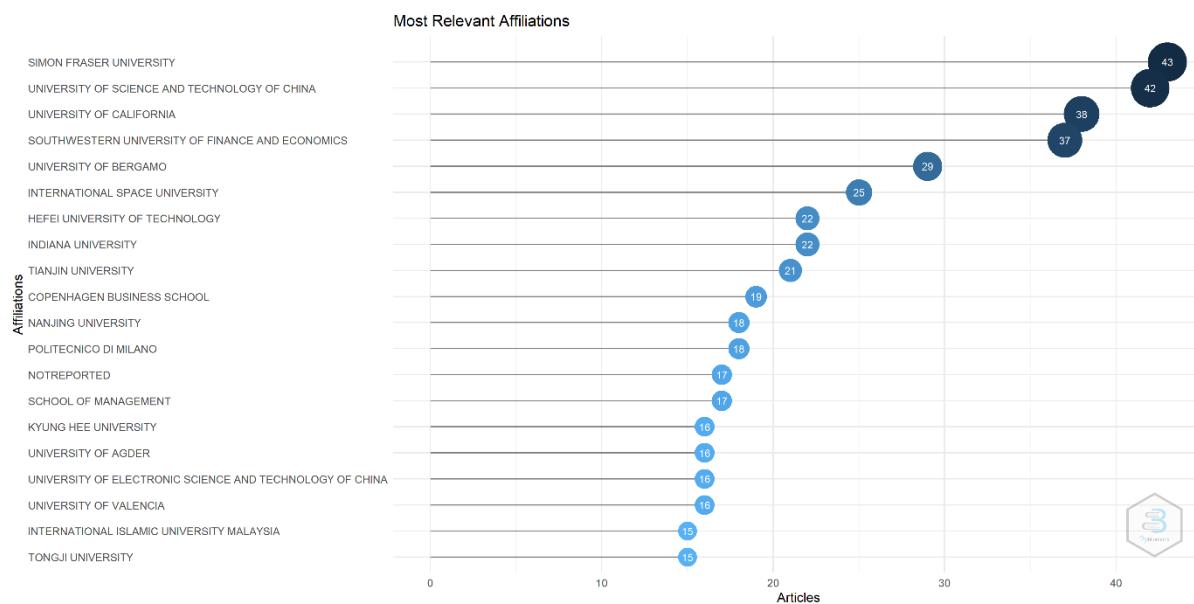
**Figure 6.** Country collaboration.

The second most single-country production is from China; their scholars have produced 129 articles out of the total 190 articles produced by China. So, China is also not much engaged in collaboration with other countries. Italy is ranked third in total publications and has a score of 73% of single-country production out of their total 89 articles. However, the recent trends, as can be seen from the Table 7, advocate about the increase in the collaboration index among authors of various countries researching on crowdfunding and P2P lending.

### 3.7. Key Affiliations Publishing on Crowdfunding and P2P Lending

The most influential affiliations are presented in Figure 7, which depicts the number of articles published by the corresponding affiliations. Simon Fraser University is the most important affiliations, and it has published 43 articles on crowdfunding-related research. This is one of the pioneer universities in British Columbia, and their scholars have given the utmost importance to the study and understanding of the various facets of crowdfunding research.

The University of Science and Technology China is the second most important affiliation and has published 42 quality articles in the domain of crowdfunding and P2P research. This university is one of the prominent institutions in China and actively pursues research in the social sciences, especially in social economics and social financing. The University of California is next in the table, with a publication of 38 top-quality research articles on various aspects of crowdfunding research.



**Figure 7.** Most influential affiliations.

#### 4. Network Analysis and Visualisation

The following section is based on the network analysis and visualisation. Citation analysis of documents, co-citation analysis of authors, and co-occurrence analysis of author keywords are conducted using the VOSviewer application to visualise the research trends in the crowdfunding research.

##### 4.1. Citation Analysis

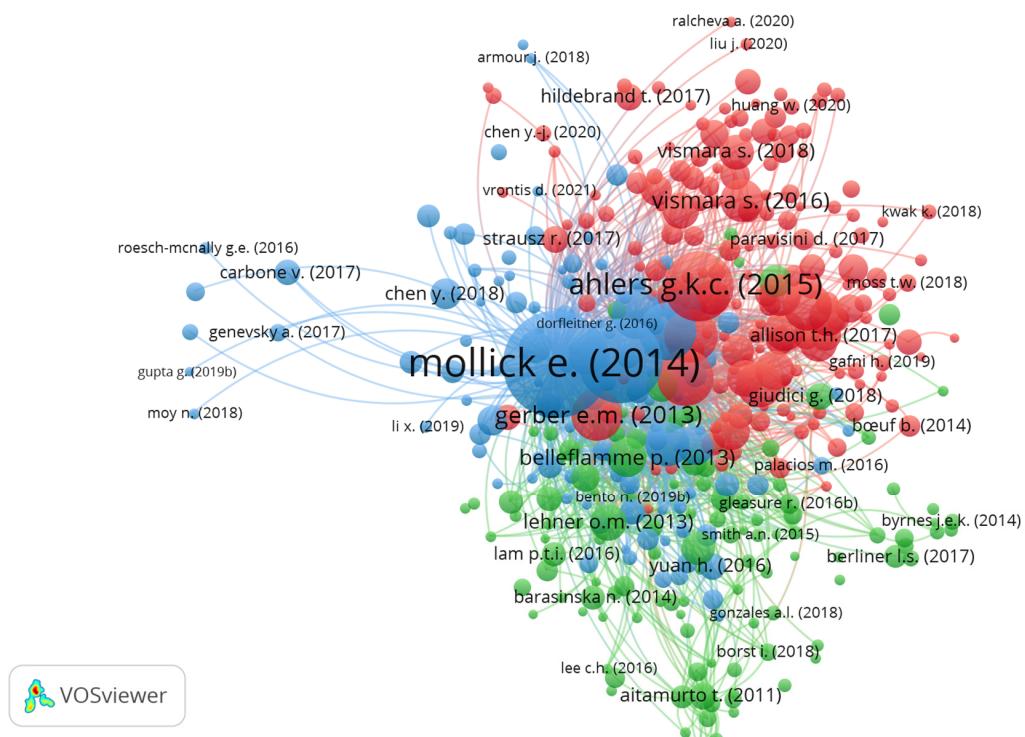
Citation analysis is a method of analysing the impact of research by measuring the total number of citations of a document, author, or source that has been cited by another document, author, or source (Abdullah et al. 2019). For the current study, the citation analysis of documents is conducted using the VOSviewer application, and the result is presented in Figure 8. The minimum number of citations for a document to be included in the analysis was kept at 15; it seems little high, but it helps in visualising the influential documents in the research streams. Only 431 documents meet the threshold criteria out of 1742 documents. The network thus formed is spread over three clusters; the largest cluster, represented with red colour, consists of 170 documents and the green cluster is made up of 114 documents. The smallest cluster has 112 documents and is represented by blue colour.

The largest cluster (red) of this network is based on the documents which have been published mostly on business venturing finance and entrepreneurial finance. This cluster is dominated by the studies such as “2Entrepreneurial Finance and Technology Transfer” (Bringmann et al. 2018); “Equity Retention and Social Network Theory in Equity Crowdfunding” (Walhoff-Born et al. 2018); “De-Segmenting Research in Entrepreneurial Finance” (Brown et al. 2018); “Information Cascades Among Investors in Equity Crowdfunding” (Walther and Bade 2020); “What Do Crowdfunding Platforms Do? A Comparison Between Investment-Based Platforms in Europe” (Rossi and Vismara 2018), etc.

The second cluster (green) of the citation network contains documents which have been published on the subareas of crowdfunding such as entrepreneurial finance, neoinstitutional perspective, social financing, crowdfunding platforms, etc. This cluster predominantly contains the documents such as “From Friend Funding to Crowdfunding: Relevance of Relationships” (Borst et al. 2018); “Social Media and Platform Activities to Crowdfunding Performance” (Shulin and Chienliang 2018); “Crowdfunding Social Ventures: A Model and Research Agenda” (Lechner 2014); “Social Finance and Crowdfunding for Social Enterprises: A Public–Private Case Study Providing Legitimacy and Leverage” (Bernardino et al. 2016); “The Formation and Interplay of Social Capital in Crowdfunded Social Ventures” (Tenner

2021); “Entrepreneurial Implications of Crowdfunding as Alternative Funding Source for Innovations” (Sousa and Azevedo 2018), etc.

The smallest cluster (blue) is made up of documents pertaining to the crowdfunding research such as “The Role of Crowdfunding in Capital Access” (Farhoud et al. 2021), “The Dynamics of Crowdfunding” (Bernardino and Santos 2018), “Strategies for Crowd Funding” (Sannajust et al. 2014), “Reward-Based Crowd Funding” (Kaiser and Berger 2021), “Pure and Hybrid Crowd in Crowdfunding Market” (Yeh et al. 2019), “Performance of Crowdfunding Projects” (Goergen and Rondi 2019), “Sustainable Entrepreneurship and Crowdfunding” (Moss et al. 2018), etc.



**Figure 8.** Citation analysis of documents.

#### 4.2. Co-Citations Analysis of Authors

Co-citation analysis is the measurement of the similarity of the contents of documents based on the citation’s relationship. Two documents can be said to be co-cited if they have been cited together by a third document (Donthu et al. 2021). The co-citation analysis was conducted using VOSviewer software, which is one of the most used applications for network visualising based on bibliometric data (Rusydiana et al. 2021). The co-citation of cited authors was carried out by keeping the minimum number of citations of an author to 10; only 562 authors met the threshold criteria out of the total authors included in the study. The network thus formed is based on four clusters and is represented by Figure 9. The largest cluster is made up of 212 authors, followed by 141, 140, and 69 authors, respectively.

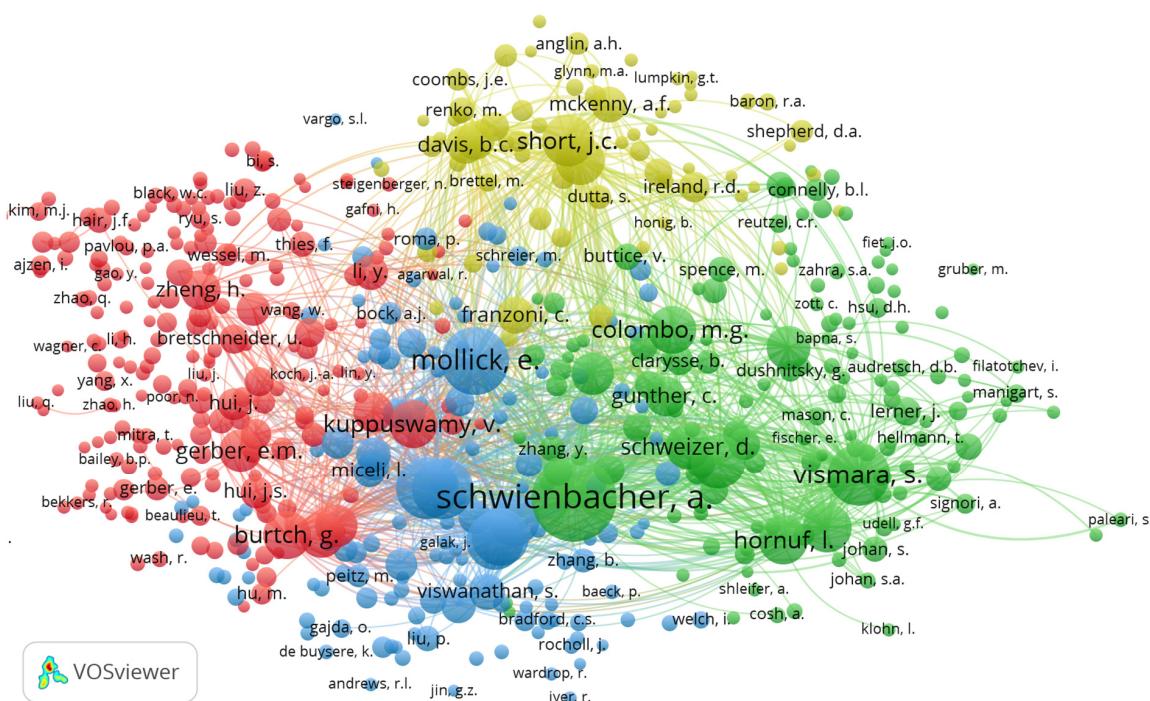
The largest cluster of the network (red) accumulates authors who have been researching the various aspects of crowdfunding and P2P lending. The most prominent authors in this cluster are Burch, G; Gerber, E.M.; Kuppuswamy, V; and Zheng, H. Burch, G has published various important articles on the subareas of crowdfunding such as referral timing and success of the crowdfunding, the influence of digital divide on crowd funding, medical crowdfunding and personal bankruptcy, provision point in crowdfunding, etc. The important studies published by Gerber, E.M. which are co-cited in this cluster are crowdfunding motivation, distributed apprenticeship, tapping the crowd for crowdfunding, etc. This cluster also indicates important behavioural research with respects to crowdfunding such as antecedents of positivism with regards to online crowdfunding,

anatomy of crowdfunding campaigns, etc. (Bessière et al. 2020; Kuppuswamy and Bayus 2018; Momtaz 2020).

The second cluster (green) is made up of 141 authors and the prominent authors in this cluster are Schwienbacher, A., who has published articles on important aspects of crowdfunding such as individual crowdfunding practices, securities regulations, and crowdfunding, crowdfunding cleantech, and market and funding mechanism of crowdfunding, innovations in crowdfunding, etc., and Vismara, S., who has published research articles on equity crowdfunding, the role of crowd funding platforms, crowd funding in healthcare, and information manipulation in crowdfunding market. Colombo M.G. is also a prominent author in this cluster and has been actively researching social capital and early investment in social financing, social capital, serial crowdfunding, external equities, and crowdfunding technologies. The other important aspects of crowdfunding found in this cluster pertain to technological adoption ([Kuanova et al. 2021](#)), crowdfunding in various sectors, especially in healthcare ([Dressler and Kelly 2018](#)), the role of equity crowdfunding ([Hornuf et al. 2018](#)), and influence of external equities in the performance of crowdfunding campaigns ([Guo et al. 2021](#)).

The blue cluster is made of prominent authors such as Mollick, A.; Viswanathan, S.; Peitz, M.; and Micelli, I., who research various important aspects of crowdfunding. The main subthemes of the crowdfunding in this cluster are evaluation of success of crowdfunding ([Shen et al. 2018](#)), democratising crowdfunding research ([Palladino 2019](#)), the role of experienced investors in crowdfunding ([Ballesteros-Ruiz and Castillo 2019](#); [Iman and Mohammad 2017](#)), the bias of home in online crowdfunding ([Leboeuf and Schwienbacher 2018](#)), and the economics of crowdfunding platforms ([Maier et al. 2021](#); [Oladapo et al. 2021](#)).

The last cluster of the co-citation network is represented by the yellow colour and consists of 69 authors. The most important authors who have contributed significantly to crowdfunding research of this cluster are Short, J.C.; Davis, B.C.; Dutta, S.; and Franzoni, C. The important subtopics of research in this cluster are persuasion in crowdfunding, the influence of positive psychological capital language on crowdfunding performance, leadership language and crowdfunding, crowdfunding microfinance, search behaviour, and decision in crowdfunding (Devigne et al. 2018; Li et al. 2018; Muhammad et al. 2021).



**Figure 9.** Co-citation analysis of authors.

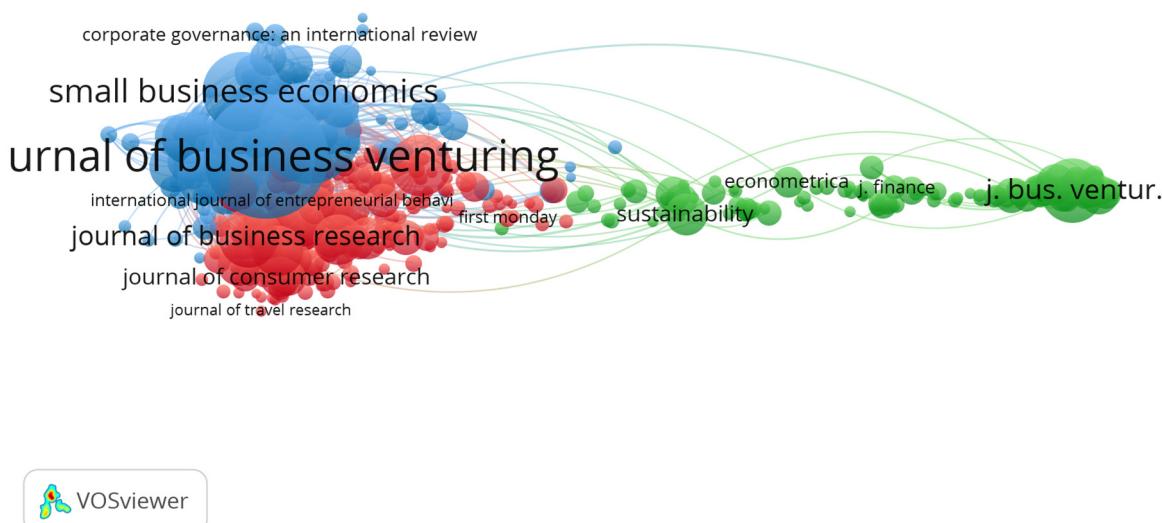
#### 4.3. Co-Citation Analysis of Sources

The co-citation analysis of sources was conducted using the VOSviewer application. The minimum threshold criteria for a journal to be included in the network was that a journal must have received at least 20 citations. The network is shown in Figure 10; it includes 481 sources classified as three distinct clusters. The largest cluster (red) consists of 207 sources, the middle cluster (green) contains 157 sources, and the smallest cluster (blue) is made up of 117 sources.

The red cluster is prominently dominated by the sources such as “*Journal of Business Research*”, “*Journal of Consumer Research*”, “*Journal of Marketing Research*”, “*Information System Research*”, “*Venture Capital*”, “*Journal of Economic Behaviour & Organisation*”, “*Electronic Commerce Research*”, “*Journal of retailing*”, etc. These journals publish articles which are primarily focused on the behavioural aspects of crowdfunding research.

The second cluster (green) contains important sources of crowdfunding research; some of the most influential journals in this cluster are “*Sustainability*”, “*Energy Policy*”, “*Renewable and Sustainable Energy Review*”, “*Journal of Economic Theory*”, “*Journal of Cleaner Production*”, “*Journal of Business Ethics*”, “*Entrepreneurship Theory and Practice*”, “*Academy of Management Review*”, “*Economic Letters*”, etc. These sources publish articles based on the critical aspects of sustainability and ethics in business. The influence of sustainability practices in business ventures and attitude toward crowdfunding are the central themes of this cluster.

The third cluster (blue) contains sources such as “*Journal of Business Venturing*”, “*Entrepreneurship Theory and Practice*”, “*Small Business Economics*”, “*Strategic Management Journal*”, “*Review of Economic Studies*”, “*Journal of Product Innovation*”, “*Journal of Small Business Strategy*”, “*Journal of International Business Studies*”, etc. These journals publish articles which have investigated the business perspective of crowdfunding and P2P lending. The business strategies and entrepreneurship and development of small businesses are the core of this cluster.



**Figure 10.** Co-citation analysis of sources.

#### 4.4. Co-Citation Analysis of Institutions

The co-citations analysis of the institutions classify the whole dataset into small clusters that focus on a specific area of research in a given subject (Radu et al. 2021). The co-citations network of affiliations is presented in the following Figure 11. For preparation of this network, two was the minimum number of articles of an institution, and each must have had at least five citations to be included in this analysis. The network thus formed has 206 institutions and is spread over four clusters. The largest cluster (red) contains 87 institutions,

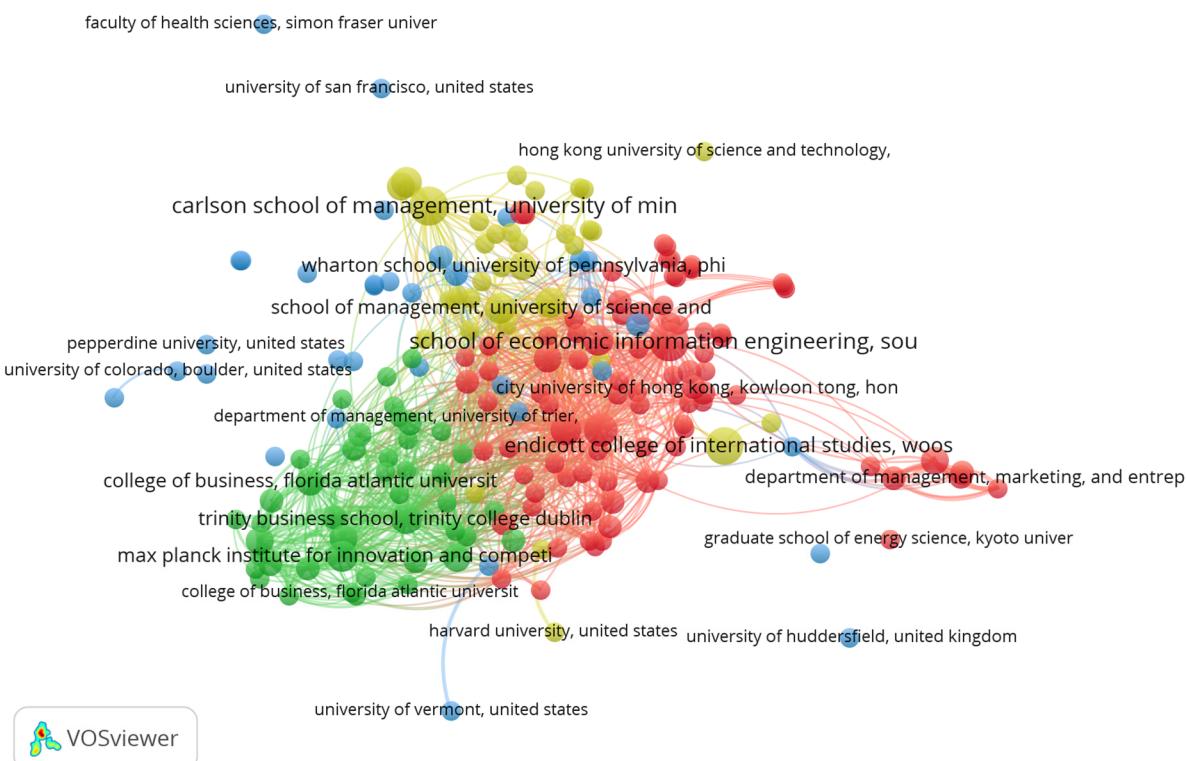
followed by the green cluster with 43 articles, the blue cluster with 37 items, and the smallest cluster of the network represented by yellow, is made up of 34 items.

The institutions such as “School of business and Law, University of Agder, Norway”, “Kelly School of Business, Indiana University”, “School of Economic Information Engineering, University of South Oregon”, “Endicott College of International Studies, Woos”, “School of Information, Renmin University of Chi”, “College of Management and Economics, Tianjin University”, “University of Alberta, Canada”, “Stockholm School of Economics”, “Department of Economics, University of Bath”, “University of Glasgow”, are a few of the prominent institutions in the red cluster.

The green cluster contains institutions such as “Trinity Business School, Trinity College Dublin”, “Indiana University, United States”, “College of Business, Florida Atlantic University”, “Max Planck Institute for Innovation and Competition”, “Birmingham Business School, Birmingham University”, “University of Antwerp, Belgium”, “University of Bremen, Germany”, “University of Bergamo, Italy”, “Ghent University”, “Jeju National University, South Korea”, etc.

The third cluster (blue) consists of “California State University”, “CESIFO, Germany”, “Huaqiao University, China”, “Cork University, Business School”, “University of Haifa, Israel”, “Simon Fraser University, Canada”, “University of Canterbury”, “Griffith University, Australia” affiliations.

The smallest (yellow) cluster is made up of institutions such as “Aalto University, Finland”, “University of Minnesota, United States”, “Shanghai University of Finance and Economics”, “Woosung University, South Korea”, “Temple University, United States”, “Stern School of Business, New York University”, “School of Management, University of Science and Technology, China”, and “School of Management Shandong University”. These institutes are committed to the exploration of various important aspects of crowdfunding and P2P lending research.

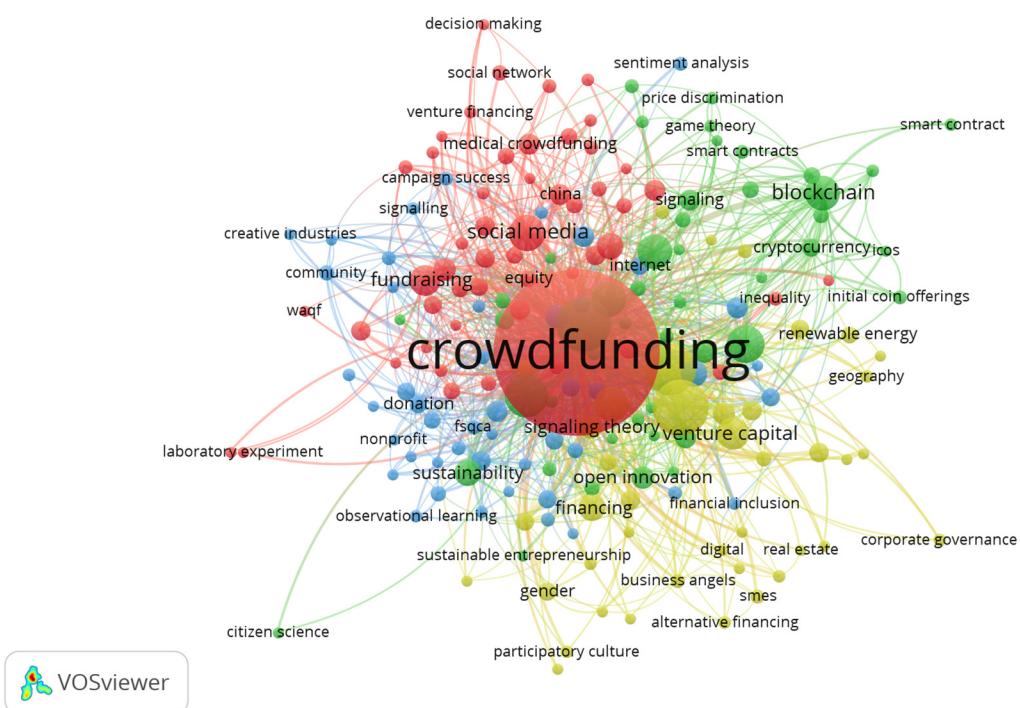


**Figure 11.** Co-citation analysis of sources.

#### *4.5. Analysis of Co-Occurrence of Keywords*

The co-occurrence of keywords are the frequency of occurrence of similar words and phrases that occurs in each set of data (Bashar et al. 2021b). For keyword co-occurrence analysis, VOSviewer software was employed, which is one of the most comprehensive scientific visualisation and mapping tools used for network bibliometric analysis (Mubarrook et al. 2020).

For the creation of the network map, the minimum number of occurrences of a keyword was kept to five. A total of 189 keywords meets the threshold criteria out of 4149 keywords available in the considered dataset. The network obtained consists of four clusters, of which the first cluster combines 52 keywords, and the second, third, and fourth clusters contain 49, 47, and 41 authors keywords, respectively. The network map is represented in Figure 12.



**Figure 12.** Co-occurrence of keywords analysis.

The largest cluster (red) of the network has coupled the studies which are based prominently on crowdfunding, medical crowdfunding, fundraising, equity, waqf, social network, social media, crowdfunding decision making, crowdfunding campaign success, etc. ([Alaeddin and Azrak 2021](#); [Astrauskaitė, Ieva 2018](#); [Hassani et al. 2020](#)). So, this cluster is the central cluster of the crowdfunding research and accommodates the most common terms used for crowdfunding research.

The second cluster (green) of this network is about the technological aspects of the crowdfunding and accommodated keywords such as initial coin offerings (Kranz et al. 2019), blockchain (Nobanee et al. 2021), smart contracts (Alaeddin and Azrak 2021), game theory (Motylska-Kuźma 2020), signalling (Katzenmeier et al. 2019), internet uses in crowdfunding (Basha et al. 2021; Kranz et al. 2019), sentiment analysis (Gu et al. 2021), price discrimination (Campillo-Artero et al. 2020), etc.

The third cluster (blue) of the network is made of 47 keywords on the research stream of crowdfunding and P2P lending. The influential keywords which have maximum occurrences are community, fund raising, donation, nonprofit, and sustainability (Giudici et al. 2018; Jo and Yang 2021; Konhäusern et al. 2021; Wehnert et al. 2019; Zheng et al. 2020).

The smallest cluster (yellow) contains 41 keywords and includes important keywords about the role of crowdfunding in entrepreneurship. The most occurring keywords in this

cluster are social entrepreneurship (Alaeedin and Azrak 2021; Tenca et al. 2019), business angels (Colombo 2021; Popescul et al. 2020), corporate governance (Farooq and Alahkam 2016; Hui and Gerber), sustainable entrepreneurship (Forgione and Migliardo 2020), participatory culture (Baucus and Mitteness 2016), venture capital (Alaeedin and Azrak 2021), renewable energy (Alaeedin and Azrak 2021), and open innovation (Elsaid 2021).

## 5. Conclusions

Crowdfunding and P2P lending are the two most exciting and latest phenomena in the financial market (Hörisch 2019; Perez et al. 2020). This study gives a detailed overview of the crowdfunding and P2P lending research by carrying out a bibliometric and meta-analysis. The study used the Scopus database to draw the conclusion. The findings of our study reveal that crowdfunding and P2P lending are the latest phenomena in the financial market and have gained momentum among academic researchers and practitioners. The study provides an overview of the crowdfunding and P2P lending research until the current moment, using both bibliometric and meta-analyses of the articles published. Our findings reveal that the research in the area is on an increasing trend and is expected to grow further, as crowdfunding and P2P lending are gaining acceptance as important financing tools for start-ups and entrepreneurs.

Based on the citation, co-citation, and keyword occurrence analysis, the following research streams are identified that can be further explored to have a better understanding of the crowdfunding and P2P lending research. There are four major areas of research that could be pursued by the researchers to expand the current state of research in crowdfunding. First, there should be more rigorous academic deliberation to understand the importance of design of campaign, which should be strategised after a careful analysis of the crowd being targeted. The behavioural aspects of crowdfunding decision-making shall also be investigated to reveal the factors that must be considered by the campaign designers. The role of web portal localisation and personalisation in shaping positive attitudes toward crowdfunding shall also be investigated.

Second, the role of the various demographic characteristics, such as educational qualification, age, gender, income, etc., in crowdfunding should be investigated. There is a need to understand the motives of the crowdfunders that can be then persuaded to take action.

Third, the characteristics of the crowdfunding platforms shall be investigated. The platforms of crowdfunding are directly associated to campaign-related factors such as reward-, donation-, equity-based, etc., and directly affect the overall performance of the crowdfunding campaign. Additionally, it is also of paramount interest to examine the best-suited crowd platform for sustainable, proenvironmental, and social crowdfunding.

Fourth, the technological aspects of the crowdfunding such as smart contract, adoption of blockchain, etc., shall also be investigated from the perspective of the security and trust of the funders. Moreover, the ethical aspects such as fraudulence in crowdfunding practices can be studied in conjunction with technological advancement, and a robust fraud-free model can be suggested.

Finally, it will be interesting to determine the team dynamics in crowdfunding—does team organisation affect the campaign and its performance?

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