

A Decade of Donation-Based Crowdfunding: A Bibliometric Analysis using the SCOPUS Database

Vijaya¹, Himendu Prakash Mathur²

¹Research Scholar, Faculty of Management Studies, Banaras Hindu University, Varanasi

²Professor, Faculty of Management Studies, Banaras Hindu University, Varanasi

Abstract

This paper conducts a bibliometric analysis of the literature on donation-based crowdfunding by identifying important publications, authors, journals, countries, and frequently occurring keywords using VOSviewer. It analyzes a dataset of 701 publications sourced from the SCOPUS database with the help of five bibliometric techniques, including co-citation analysis, citation analysis, co-occurrence analysis, co-authorship, and bibliographic coupling. The citations and co-citation analysis of references reveal that "The dynamics of crowdfunding: An exploratory study" by Mollick, 2014 is the most cited article". Citation, Co-citation, and co-occurrence analysis of authors indicate that Snyder, J., Burtch, G., Schwenbacher, A., Lambert, T., Belleflamme, P., Catalini, C., Goldfarb, A., and Agrawal, A. are the prominent authors in the field. Bibliographic coupling of sources suggests that the journal "Sustainability" (20) leads in publications, followed by "Technological Forecasting and Social Change" (16). Moreover, a co-occurrence analysis of author keywords reveals that the keywords which frequently occur around donation-based crowdfunding are "Social Media," "Entrepreneurship," "Entrepreneurial Finance," "Social Capital," and "Fundraising." Finally, the citation analysis of the country of publications shows that the United States leads in the number of publications (187), followed by China (89).

Keywords: Bibliometric analysis, VOSviewer, SCOPUS, Donation-based crowdfunding, Donation crowdfunding, Charitable crowdfunding

Introduction

Fintech products have enticed the entire world with their widespread growth. The expansion of digital fintech products (Hasan et al., 2020) provides complementary support to the alternative traditional sources of financing (Lee and Shin, 2018). Crowdfunding is one such fintech innovation that has grabbed the eyeballs of people across the globe (Baber, 2020; Burtch et al., 2018; Harris and Wonglimpivarat, 2020) and has brought a revolutionary change in the entrepreneurial financing ecosystem (Bruton et al., 2015; Cicchiello, 2019; Ricciardi et al., 2021). It allows access to financial resources, a critical challenge for budding entrepreneurs and projects (Cholakova and Clarysse, 2015; Buttice et al., 2018; Kraus et al., 2016; Mariani et al., 2017; Mollick, 2014). Crowdfunding is a phenomenon that has developed due to the problems faced by individuals while procuring funds through traditional sources (Bruton et al., 2015; Cholakova and Clarysse,

Corresponding Author: Vijaya, Research Scholar, Faculty of Management Studies, Banaras Hindu University, Varanasi, Email: vijaya2890@gmail.com

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2015; Harrison, 2013) as well as improvement in Web 2.0 technology (Brunetti, 2016; Danmayr, 2014; Gleasure and Feller, 2016). It allows crowd participation through virtual community participation (Ley and Weaven, 2011; Ryu and Suh, 2020; Stiver et al., 2015) in obtaining funds for projects which otherwise would not grab the attention of traditional sources of financing (Belleflamme et al., 2013).

Donation crowdfunding, a form of crowdfunding that is based on pure philanthropic motive, has gained widespread acceptance in various developed and developing nations because of its ease and simplicity and is widely used as a financial tool for

the procurement of funds (Brown et al., 2017; Chen et al., 2016; Troise, 2019). In addition, donation crowdfunding can also be viewed from the lenses of social welfare (Hoque et al., 2018; Zhao and Sun, 2019), brand awareness (Allison et al., 2015; Aitamurto, 2015; Brown et al., 2017; Simons et al., 2019) and virtual interactive platform allowing an exchange of ideas and resources (Greenberg et al., 2013; Ryu and Suh, 2020).

The crowdfunding concept has gained the increased attention of researchers over the past decade, and many researchers have analyzed the crowdfunding literature through systematic reviews and bibliometric analysis by garnering the emerging research directions in the area (Abdullaha et al., 2019; Gil-Gomez et al., 2021; Kaartemo, 2017; Martínez-Climent et al., 2018; Shneor and Vik, 2020; Zhang et al., 2018). However, the existing literature primarily focuses on the general overview of crowdfunding research, and there exists a lack of studies that unifies and summarizes the literature in specific reference to the donation model of crowdfunding, including its knowledge structure and objective analysis of the research field. To the best of our knowledge, only two studies by Salido-Andres et al. (2021) and Alegre and Moleskis (2021) map the literature on the donation model of crowdfunding, but it focuses more on systematic literature review than a detailed quantitative evaluation of the literature on donation model of crowdfunding as use of bibliometric tools can provide additional insights not previously fully explored or appraised (Garfield and Merton, 1979; Samiee and Chabowski, 2012; Todeschini and Baccini, 2016; Van Eck and Waltman., 2010). Hence, this study aims to fill this gap by conducting a bibliometric analysis to provide a more comprehensive overview of studies catering to the donation model of crowdfunding by using various bibliometric tools. The literature for conducting bibliometric analysis on donation-based crowdfunding is procured through the SCOPUS database.

The rest of the paper is organized as follows- firstly, it discusses the research questions that the study addresses, followed by the description of the methodology. Next, the results of the bibliometric analysis are presented using various bibliometric tools, along with a discussion on emerging trends and current topics. Further sections deal with the discussion, contribution, and conclusion.

Research Questions

This study aims to address the following research questions through bibliometric analysis-

RQ1 What are the most cited publications that add knowledge to the research concerning donation-based crowdfunding?

RQ2. Which authors and countries are active in the research concerning donation-based crowdfunding?

RQ3. Which are the top journals regarding publication productivity concerning donation-based crowdfunding?

RQ4. What are the emerging and trending topics concerning donation-based crowdfunding, including the thematic evolution of the field?

Methodology

Data

The literature on donation-based crowdfunding for the bibliometric study is procured through the SCOPUS database. The SCOPUS is Elsevier's database launched in 2004. The SCOPUS database is used because it covers approximately 34000 peer-reviewed journals from about 11000 publishers. It covers a broader range of scholarly articles pertaining to life sciences, social sciences, business, and administration (Herrera-Franco et al., 2020). We conducted this bibliometric study using only the

SCOPUS database as using a single database in the bibliometric analysis allows easy standardization of data (Palomo et al.,2017) and user-friendly

citation searching tools. Table 1 shows the search string used to extract literature on donation-based crowdfunding.

Table 1: Search string used to extract literature on donation-based crowdfunding

```
((TITLE-ABS-KEY(crowdfunding) AND TITLE-ABS-KEY("donation-based" OR "donation model" OR "donation-oriented" OR donation OR charity OR charitable OR "charitable project" OR "online charity" OR "nonprofit" OR "not-for-profit" OR social OR "social-offering" OR philanthropic OR "internet donation")) AND (LIMIT-TO (LANGUAGE,"English")) AND (LIMIT-TO (SRCTYPE,"j"))))
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Source: Author's own

We extracted the relevant literature from the SCOPUS database on 27 September 2022. To better understand and analyze the results, we restricted the search only to publications in the "English" language. Further, the source type was restricted to only journals in order to allow the identification of prominent journals. The search fetched 791 results downloaded in the .csv format. The time frame covered in the study was between 2012-2022 (Till 27th September). The reason behind choosing this particular decade is that the concept of crowdfunding emerged around 2005-2006, but research in the area only started gaining momentum around 2012.

Method

The bibliometric analysis is a tool that quantitatively analyses the available data (Broadus, 1987; Chen and Xiao, 2016; Diodato and Gellatly, 2013; Ellegaard and Wallin, 2015). We use Vosviewer to conduct bibliometric analysis. It encompasses the use of citation analysis, co-citation analysis, bibliographic coupling, co-authorship analysis, and co-occurrence analysis to analyze the scientific data (Van Eck and Waltman, 2010). We have procured the data for the bibliometric study from the SCOPUS database. The SCOPUS

database suffers from certain limitations, such as using non-standard forms of references. Hence, in order to clean the data and standardize the references, we used BibExcel. The need to clean and standardize data is a common problem faced in the bibliometric study (Ferrara and Salini, 2012). After standardizing data, we analyzed the sample publications using five bibliometric techniques: co-citation analysis, co-occurrence analysis, co-authorship analysis, bibliographic coupling, and citation analysis.

We use VOSviewer 1.6.15 to analyze the literature on donation-based crowdfunding. VOSviewer is a bibliometric analysis software used for analyzing and visualizing scientific literature. It was developed by Nees Jan van Eck and Ludo Waldman. It allows data analysis using citation networks, co-citation networks, co-authorship networks, bibliographic coupling networks, and co-occurrence networks (Van Eck and Waltman, 2010). We also described the sample publications selected for the study using Microsoft Excel.

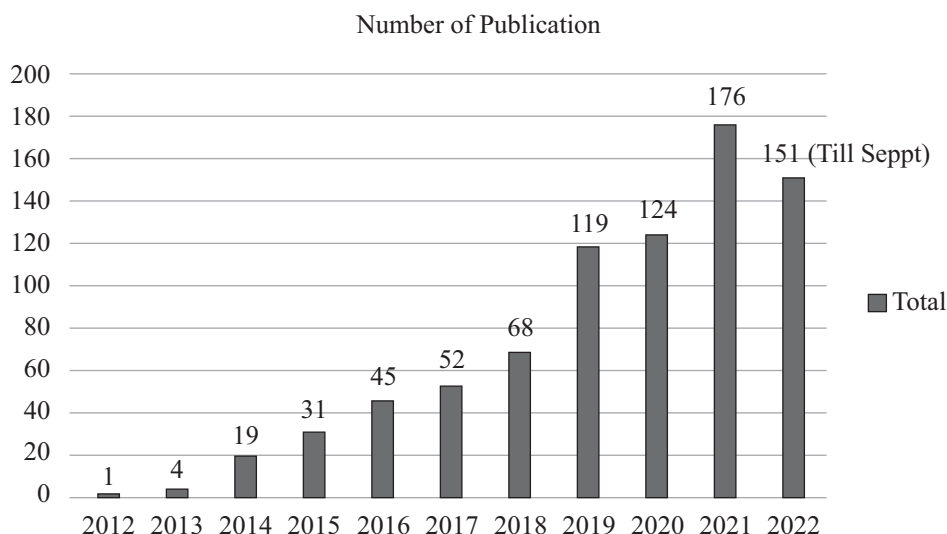
Results

Publication output per year

Table 2: Number of Publications per year

Year	Number of publications	Percentage (out of 860)
2022	155	18.02
2021	189	21.98
2020	134	15.58
2019	130	15.12
2018	79	9.19
2017	59	6.86
2016	47	5.47
2015	37	4.30
2014	21	2.44
2013	6	0.70
2012	3	0.35

Source: SCOPUS

Figure 1: Number of Publications per year

Source: Author's own

Table 2 depicts the timeline of the number of publications per year in the field of donation-based crowdfunding ranging between 2012-2022. It helps to understand the progress and maturity of the topic. The term crowdfunding was first introduced in the year 2006, although the phenomenon or the process of crowdfunding dates back over centuries. The donation-based crowdfunding in academic research has gained attention since 2012, and

researchers have focused on various dimensions of donation crowdfunding. As a result, academic publications on donation-based crowdfunding have gained substantial momentum in recent years. This shows the increasing interest of researchers in the area of donation-based crowdfunding. Figure 1 shows the graphic representation of the total number of publications during the period.

*Type of publications and subject areas***Table 3:** Type of publications and subject areas

Type of Publication	No. of publications	Percentage of 860
Article	790	91.86
Note	33	3.84
Review	12	1.40
Erratum	6	0.70
Conference Paper	5	0.58
Editorial	4	0.47
Short Survey	4	0.47
Data Paper	4	0.47
Letter	1	0.12
Undefined	1	0.12
Subject Areas	No. of publications	Percentage of 860
Business, Management and Accounting	400	46.51
Social Sciences	278	32.33
Economics, Econometrics and Finance	191	22.21
Computer Science	164	19.07
Medicine	85	9.88
Engineering	83	9.65
Decision Sciences	81	9.42
Arts and Humanities	76	8.84
Psychology	57	6.63
Environmental Science	55	6.40
Energy	49	5.70
Mathematics	22	2.56
Biochemistry, Genetics and Molecular Biology	15	1.74
Multidisciplinary	13	1.51
Agricultural and Biological Sciences	11	1.28
Others	42	4.88

Source: SCOPUS

Table 3 shows the type of publications and the subject area within which researchers have studied the concept of donation-based crowdfunding. The type of publications used in our study shows that out of 860 publications, 91.86% are research articles published in the journal. This indicates that most of the studies in the area of donation-based

crowdfunding are in the form of research articles published in various journals.

Further, it also shows the subject area of publications pertaining to the topic of our study. The maximum number of publications are in Business, Management, and Accounting (46.51%), followed

by Social Sciences (32.33%). This is typical as the topic of crowdfunding, especially donation-based crowdfunding, has its genesis in social interaction and is used to fund and manage businesses or projects that cater to a specific domain. The publications are also rooted in the area of Economics, Econometrics and Finance (22.21%), Computer Sciences (19.07%), Medicine (9.88%),

and Decision Sciences (9.42%), which highlights the importance of computer-based WEB 2.0 technology to fund the donation-based crowdfunding projects including projects catering to medical needs. Since the publications can cater to more than one subject area, the sum of the subject area percentage is more than 100%.

Citation and Co-citation analysis of references

Table 4: Co-citation analysis of references

Author	Title	Citations	Link strength
Mollick (2014)	The dynamics of crowdfunding: An exploratory study	398	956
Belleflamme et al. (2013)	Individual crowdfunding practices.	260	194
Saxton and Wang (2014)	The social network effect: The determinants of giving through social media	190	583
Greenberg and Mollick (2017)	Activist choice homophily and the crowdfunding of female founders	186	487
Beaulieu et al. (2015)	A conceptual framework for understanding crowdfunding	96	478
Berliner and Kenworthy (2017)	Producing a worthy illness: Personal crowdfunding amidst financial crisis	94	346
Liu et al. (2018)	Empathy or perceived credibility? An empirical study on individual donation behavior in charitable crowdfunding	83	281
Gleasure and Feller (2016)	Does Heart or Head Rule Donor Behaviors in Charitable Crowdfunding Markets?	80	146
Bagheri et al. (2019)	Crowdfunding motivations: A focus on donors' perspectives	64	532
Moon and Hwang (2018)	Crowdfunding as an alternative means for funding sustainable appropriate technology: Acceptance determinants of backers	58	199
Jian and Shin (2015)	Motivations Behind Donors' Contributions to Crowdfunded Journalism	50	402
Majumdar and Bose (2018)	My words for your pizza: An analysis of persuasive narratives in online crowdfunding	49	467

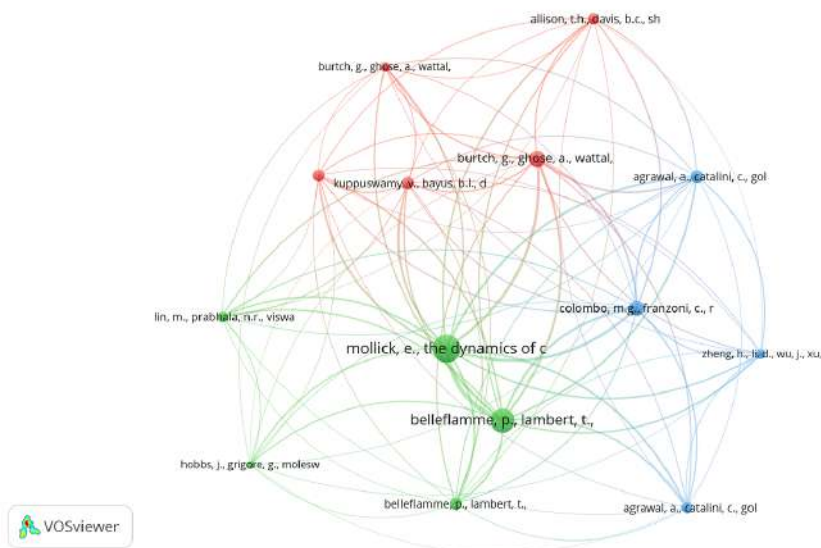
Author	Title	Citations	Link strength
Chen et al. (2016)	What really makes a promotional campaign succeed on a crowdfunding platform? Guilt, utilitarian products, emotional messaging, and fewer but meaningful rewards drive donations	48	410
Capraro et al. (2019)	Increasing altruistic and cooperative behaviour with simple moral nudges	42	304
Chen et al. (2019)	Donate time or money? The determinants of donation intention in online crowdfunding	40	200

Source: VOSviewer

Table 4 shows the top 15 results of the co-citations analysis of references. Co-citation analysis refers to the frequency with which two articles are cited together in other articles. We show only the top 15 results. The detailed analysis of the co-citations of the references refers to the foundations of the research area by pairing articles in the cluster which share a common theme. We have shown the citations received by each reference in the sample list of publications derived through the SCOPUS database and its link strength. The link strength

refers to the degree of association between the articles. It indicates a distant relationship between the articles. All the articles are consistent as per their position in the list regarding their citations and link strength. The article "The dynamics of crowdfunding: An exploratory study" authored by Ethan Mollick tops the list with 398 citations in the sample, followed by "Individual crowdfunding practices" co-authored by Paul Belleflamme, Thomas Lambert, and Armin Schwenbacher with 260 citations.

Figure 2: Visual map of reference co-citation



Source: VOSviewer

Fig. 2 represents the reference co-citation of the top 15 articles. Each reference is depicted as a label and the number of times the reference is cited is

represented in terms of font size, i.e., the greater the font size, the greater will be its citation frequency. Further, the distance between each reference

represents the chances of them being cited together, i.e., the closeness between the references shows higher chances of them being cited together. The references belonging to the same cluster also indicate greater chances of them being cited together. Fig. 2 has been divided into three clusters represented in red, blue, and green colors. The cluster in green color comprises five articles by Mollick (2014), Bellefalmme et al. (2013, 2014), Hobbs et al. (2016), and Lin et al. (2013). The green cluster can be accredited to the studies focusing on factors leading to the success and failure of crowdfunding projects, including its purpose, orientation, funding goal, signaling, spatial proximity, etc. Thus, it can be categorized as "factors influencing crowdfunding success and failure." The cluster in red color comprises five articles by Burtch et al. (2013, 2015), Kuppawamy and Bayus (2017), Calic and Mosakowski (2016), and Allison et al. (2015). The red cluster majorly focuses on motivating factors that drive fund-providers to invest or fund in crowdfunding campaigns. Therefore, it can be labeled as "factors motivating fund-providers to participate in crowdfunding campaigns". The third cluster represented in blue color is comprised of four articles by Agrawal et al. (2014, 2015), Zheng et al. (2014), and Colombo et al. (2015). This cluster majorly studies the role of social capital, social networks, and social media in driving a

campaign towards success.

Analysis of most active authors

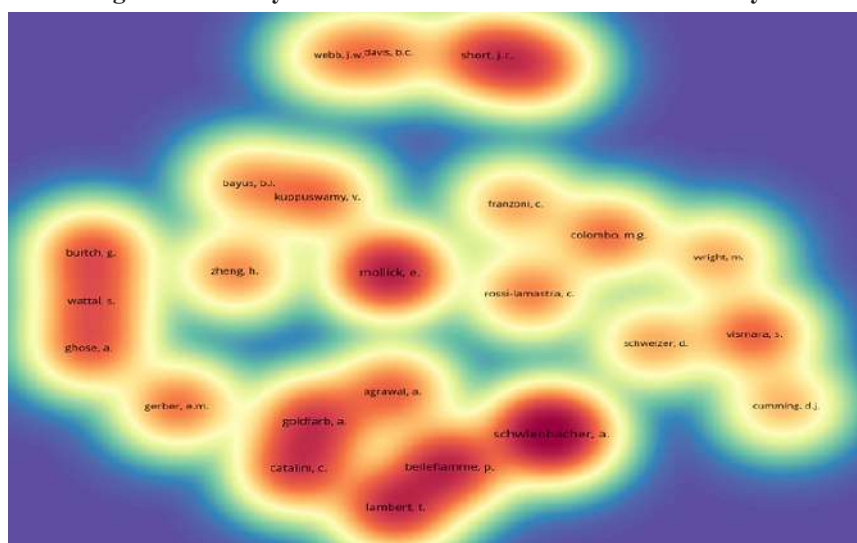
We analyze the most active authors in the research concerning donation-based crowdfunding through citation, co-citation, and co-authorship analysis. Table 5 shows the citation analysis of the authors. We show only the top 15 results in the area of the donation model of crowdfunding. The top-cited author in the list is Snyder, J., with 16 published articles. His top-cited article is "Fund my treatment! A call for ethics-focused social science research into the use of crowdfunding for medical care," published in the year 2016 with Mathers A. and Crooks V.A. as co-authors (Synder et al., 2016). This article highlights the ethical concerns in medical crowdfunding campaigns, including the beneficiaries of medical crowdfunding campaigns, fairness in regard to actual fund distribution, and the privacy of the funders. Li, Y. is second on the list with 11 published articles. On the other hand, the authors such as Wang, T., Anglin, A.H., Short, J.C., and Baber, H. have received a high number of citations, having published seven articles each in the area of donation crowdfunding, respectively. This signifies that their articles have high relevance in the area of donation crowdfunding and have extensively analyzed the given field across various aspects.

Table 5: Author Citation Analysis

Author	Affiliations	TP	TC	TC/TP	Link strength
Snyder, J.	Simon Fraser University, Canada	16	180	11.25	19
Li, Y.	University of Nevada, Las Vegas, USA	11	79	7.18	31
Wang, T.	Southwestern University of Finance and Economics, China	7	77	11.00	19
Anglin, A.H.	Texas Christian University, USA	7	306	43.71	48
Short J.C.	University of North Texas, USA	7	305	43.57	48
Baber, H.	Abu Dhabi School of Management, Abu Dhabi, UAE	7	647	92.43	19
Burtch, G.	Boston University, USA	6	706	117.67	25
Gleasure, R.	Copenhagen Business School, Denmark	6	209	34.83	14
Shneor, R.	University of Agder, Norway	6	16	2.67	18
Chen, Y.	Zhejiang University of Finance and Economics, China	5	67	13.40	25
Zheng, H.	Southwestern University of Finance and Economics, Chengdu, China	5	477	95.40	32
Allison, T.H.	Texas Christian University, USA	5	150	30.00	24
Zhang, X.	Tianjin University, China	4	157	39.25	19
Shneor, R.	University of Agder, Norway	4	143	35.75	18
Schwienbacher, A.	SKEMA Business School, France	4	299	74.75	16

Source: VOSviewer

Figure 3: Density Visualization of Author Co-citation Analysis



Source: VOSviewer

Figure 3 represents the density visualization of the co-citation analysis of authors. We show only those authors who have received at least 150 citations to avoid the clutter in the density map and show the prominent authors in the domain of donation-based crowdfunding. The red color represents the most cited authors, and the yellow color represents the authors that have received fewer citations. Further, the author's position on the map highlights their association, i.e., the closeness between authors shows the possibility of them appearing together. The results are spread around five clusters. Burtch, G. leads the first cluster, comprising authors such as Wattal, S. and Ghose, A. This cluster focused more on the role of information disclosure and information symmetry in donation-based crowdfunding, including prosocial orientation and contribution dynamics. The second cluster is led by Schwenbacher, A. and includes authors such as Lambert, T., Belefamme, P., Catalini, C., Goldfarb, A., and Agrawal, A., whose primary area of study has been analyzing donation crowdfunding through the lenses of information asymmetry, geographic proximity, and project timing in driving fund providers towards funding the projects. Mollick, E. heads the third cluster, comprising other authors such as Bayus, B.L., Kuppaswamy, V., and Zheng, H. This cluster primarily focused on the framework of success and failure of donation crowdfunding projects. Short, J. C. leads the fourth cluster, followed by other authors such as Webb,

J.W., and Davis, B.C., whose work revolved around persuasive influence to drive funders towards donating funds in donation crowdfunding. Vismara, S. leads the fifth cluster with authors such as Colombo, M.G., Cumming, D.J., who focused more on the internal dynamics of different social crowdfunding models.

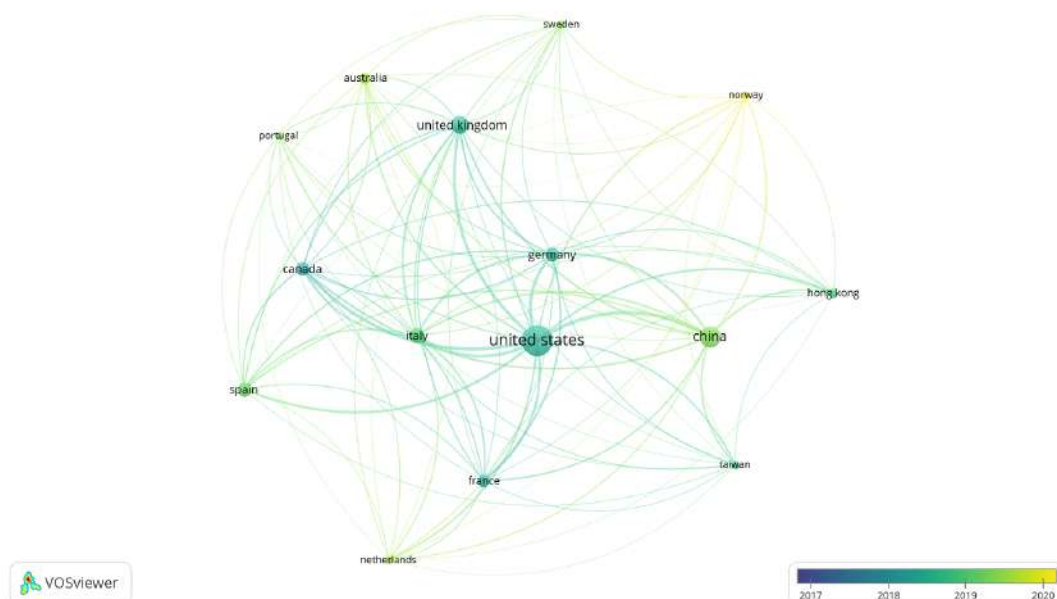
Analysis of most active countries

We analyze the most active countries in the research concerning donation-based crowdfunding through citation analysis of countries. Table 6 shows the list of the top 15 countries with the most publications in the field of donation-based crowdfunding. The USA tops the list with the highest number of articles on the donation model of crowdfunding with 235 publications, followed by China (112), the United Kingdom (86), Germany (54), and Italy (54), respectively. In addition, the United States of America has the highest number of citations (6460) and link strength (2297), signifying that the articles published in the USA are more relevant in the field of the donation model of crowdfunding. On the other hand, China holds the second position regarding the number of publications indicating the growing interest of Chinese researchers in donation-based crowdfunding compared to other nations. Further, it also shows that the research on donation-based crowdfunding is still evolving and shows expansion trends across multiple countries globally.

Table 6: Citation analysis of top 15 Countries with publications on donation-based crowdfunding

Country	Documents	Citations	Link Strength
United States	235	6460	2297
China	112	1781	1342
United Kingdom	86	2253	1061
Italy	54	1919	970
Germany	54	2020	963
Canada	47	2153	837
Spain	46	868	576
France	38	619	531
Australia	29	690	319
Malaysia	29	482	317
South Korea	26	251	308
Hong Kong	21	382	274
India	21	247	274
Indonesia	20	115	253
Sweden	14	254	217

Source: VOSviewer

Figure 4: Visual map of citation analysis of countries

Source: VOSviewer

Figure 4 shows the visual map of leading countries with the most publications in the field of donation-based crowdfunding. The figure shows that the USA and China are located at the center. The USA appears bluish-green, suggesting the average publication year between 2019 and 2020, whereas China seems green, indicating the average publication year around 2020. This shows that although the articles catering to donation-based crowdfunding are prominent in the USA, China has gained momentum in recent years with an increasing number of publications in the domain. The figure also shows that from 2020 onwards, there has been growing interest among other countries, such as Norway, Netherlands, Sweden, Portugal, Spain, and Australia, in the domain of donation-based crowdfunding. Further, countries such as Hungary, United Arab Emirates, Indonesia, and Pakistan are newcomers to the field and are venturing into the area of donation crowdfunding.

Analysis of top sources (journals)

We show the top journals in terms of publication productivity concerning donation-crowdfunding

through the bibliographic coupling of sources. Table 7 shows the top 15 results of the bibliographic coupling of sources. Bibliographic coupling measures the similarity relationship between two sources. We only show the top 15 sources out of 160 sources in which most publications on the theme of donation-based crowdfunding appear, as it is impossible to list all the sources in a single table. The citations refer to the number of citations received by the particular source, and link strength describes the publications' relevance with the concerned topic. It also shows the number of publications in a journal, the number of forwarding citations received by the journal (pertaining to the topic of the donation model of crowdfunding), and the number of citations per article.

The journal "Sustainability" tops the list with 25 publications on the theme of donation-based crowdfunding. It accounts for 17.24% of the top 15 sources and 4.85% of the total sample publications. The top-cited article in "Sustainability" is "Crowdfunding as an alternative means for funding sustainable, appropriate technology: Acceptance determinants of backers" by Moon and Hwang

(2018), with 57 citations in the SCOPUS. It highlights that the key factors influencing user intention to crowdfund appropriate technology projects include social influence, effort expectancy, and perceived trust.

The journal "Technological Forecasting and Social Change" stands second, with 19 publications accounting for 13.10% of the top 15 sources and 2.28% of the total sample publications. The top-cited article in this journal is "Crowdfunding motivations: A focus on donors' perspectives" by Bagheri et al. (2019). It qualitatively analyses the motivation of fund providers to engage in the donation-crowdfunding campaign. The findings reveal that both extrinsic and intrinsic motivation plays a significant role in dictating the funding behavior of fund providers.

The journals "Sustainability" and "Technological

Forecasting and Social Change" have similar citations per article, but the journal "Sustainability" has a greater number of publications (25), and the journal "Technological Forecasting and Social Change" has higher link strength than the journal "Sustainability," which signifies that the articles published in "Technological Forecasting and Social Change" are more pertinent to the field of donation-crowdfunding. The journal "Entrepreneurship Theory and Practice" has the highest number of forwarding citations and citations per article, signifying this journal's popularity amongst researchers in the field across the globe. Further, the inclusion of the journals "New Media and Society" and "Decision Support System" in the top 15 list suggests that the domain of donation model of crowdfunding does not only cater to the area of entrepreneurship, business, management, and accounting but also focuses on management information systems and communications.

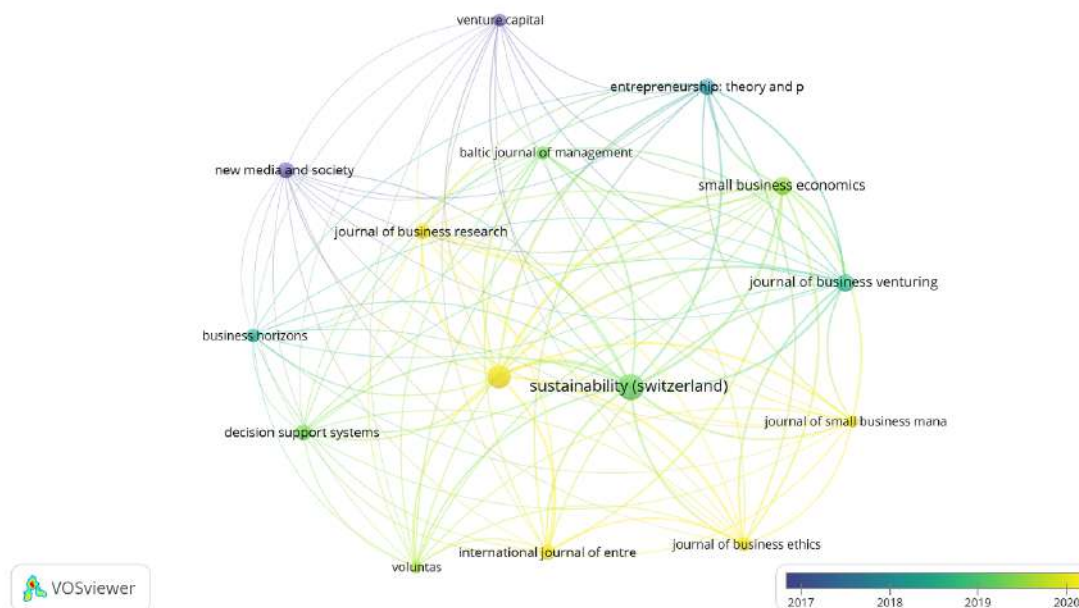
Table 7: Bibliographic Coupling of Sources

Source Title	H-index	Number of Publications	Number of forward citations	Number of citations per article	Link Strength
Sustainability	109	25	279	11.16	8631
Technological Forecasting and Social Change	134	19	215	11.32	10616
Journal of Business Venturing	196	12	734	61.17	5890
Small Business Economics	142	11	669	60.82	6588
International Journal of Entrepreneurial Behaviour and Research	75	10	81	8.10	5672
Journal of Business Research	217	9	176	19.56	4434
Decision Support Systems	161	9	262	29.11	2424
Entrepreneurship- Theory and Practice	169	8	1913	239.13	4333
New Media and Society	124	8	291	36.38	1164
Journal of Business Ethics	208	7	133	19.00	4312

Source Title	H-index	Number of Publications	Number of forward citations	Number of citations per article	Link Strength
Financial Innovation	25	6	45	7.50	1996
Venture Capital	54	6	874	145.67	1580
Business Horizons	97	6	302	50.33	1453
Baltic Journal of Management	31	5	43	8.60	3044
VOLUNTAS- International Journal of Voluntary and Nonprofit Organizations	56	4	63	15.75	2622

Source: VOSviewer

Figure 5: Visual map of bibliographic coupling of sources



Source: VOSviewer

We also show the visual map of the top 15 results of bibliographic coupling of sources based on average publication year in Figure 5. The journal "Sustainability" and "Technological Forecasting and Social Change" appears at the centre showing the prominence of these journals in the area of donation crowdfunding. The results are consistent with Table 7. "Sustainability" appears in dark green, indicating that it has a more significant number of articles published around 2019. "The Journal of Business Research," "Journal of Business Ethics," "International Journal of Entrepreneurial Behaviour and Research," "Technological Forecasting and Social Change," and

"Journal of Small Business Management" appear in light green, suggesting the average publication year to be in between 2020-2021 emphasizing on the popularity of these journals amongst academicians and researchers in recent times. More articles published in the journals "Entrepreneurship: Theory and Practice" and "Business Horizons" range between 2018 and 2019.

Analysis of emerging and trending research topics, including thematic progression of the topic

We show the top emerging and trending research topics through co-occurrence analysis of author keywords.

Table 8 shows the top 15 keywords frequently appearing in the author's keywords revolving around the publications on donation-based crowdfunding analyzed based on average publication years. Occurrences signify the frequency of the keywords appearing in the publications. Link strength refers to the relevance of the keywords pertaining to the study. The

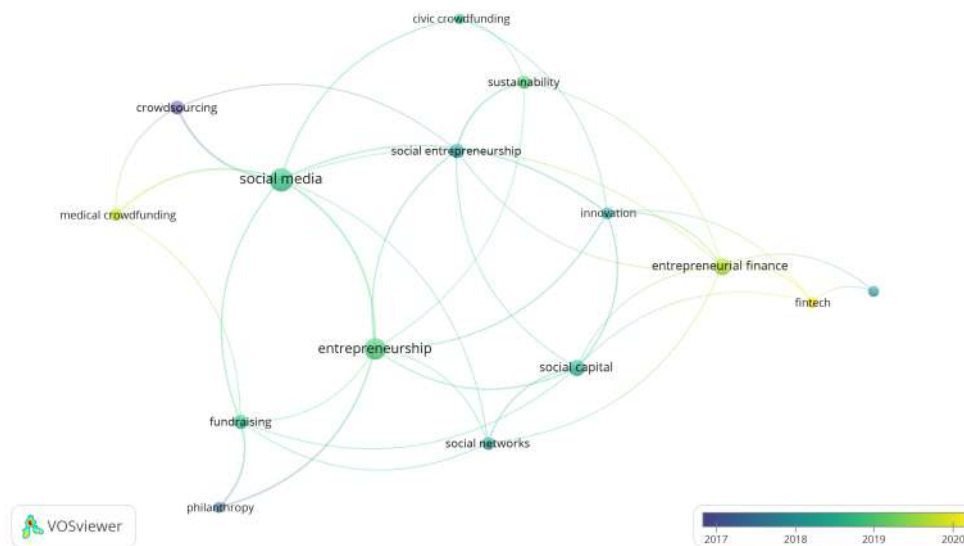
keywords that appear frequently are "social entrepreneurship," followed by "Social media". The inclusion of Covid-19 among the top 15 keywords highlights the extensive use of crowdfunding in extending personal and community help during the tough pandemic period.

Table 8: Results of Author keywords co-occurrence

Keyword	Occurrences	Link Strength
Social Entrepreneurship	87	320
Social Media	75	116
Entrepreneurship	58	122
Theory of planned behaviour	51	248
Fundraising	47	242
Sentiment	42	240
Intention to donate	42	320
Islamic Finance	40	87
Social networks	39	50
Social Capital	29	62
Twitter	27	42
Crowdfunding Platforms	26	47
Medical	25	42
Covid-19	23	48
Signaling	21	46

Source: VOSviewer

Figure 6: Visual map of Author keywords co-occurrence by average publication year



Source: VOSviewer

Figure 6 shows the author's keywords that revolve around donation-based crowdfunding. The figure shows that "social media" and "entrepreneurship" appear in dark green colour, suggesting more use of these keywords ranging between the average publication years 2019 and 2020 in the articles. On the other hand, keywords such as "social entrepreneurship," represented by its large circle size, appear in the center of the map in light green color, signifying that the articles linking donation-based crowdfunding with social entrepreneurship have their average publication year ranging between 2020 and 2021. The figure further highlights the recent focus of researchers in the area on "intention to donate", "sentiment", "Islamic finance", and "theory of planned behaviour".

We further show the thematic progression of the topic over the last decade (2012-2022) in the area of donation-based crowdfunding based on the author keywords. This shows the overall trend and shift in the interest of the researchers in the area. We segregate the years into five categories, each representing a time span of two years. The top keywords that have the highest average normalized citations (ANC) are shown in Table 9. We normalize the citations by dividing an article's citations by the average number of citations received by all the publications in the corresponding year to remove the age bias, as the old articles have more citations than the newer ones. Since it is impossible to list all the keywords (1039 in total), we only show the author keywords with ANC scores of greater than 1.

Table 9: Thematic progression of keywords based on the average normalized citations (ANC)

2012-2014		2015-2016		2017-2018	
Keywords	ANC	Keywords	ANC	Keywords	ANC
Crowdfunding	4.65	Crowdsourcing	3.92	Motivation	4.21
Fundraising	3.76	Entrepreneurship	2.94	Social Identity Theory	3.13
Charity	1.52	Social Media	1.56	Crowdfunding Platforms	2.72
Internet	1.14	Online Community	1.25	Medical	1.38
		Signaling	1.02	Health	1.12
2019-2020		2021-2022			
Keywords	ANC	Keywords	ANC		
Sustainability	2.46	Theory of Planned Behaviour	3.52		
Social Entrepreneurship	1.96	Sentiment	2.06		
Information Asymmetry	1.54	Islamic Finance	1.64		
Pandemic	1.32	Intention to Donate	1.46		
COVID-19	1.28	Trust	1.34		
Success Factors	1.12	Twitter	1.18		
Blockchain	1.08				

Source: VOSviewer

The donation-based crowdfunding concept dates back to 2006, but research in the area gained momentum only in 2012. During the early phase (2012-2014), then area of research was limited to basics with keywords revolving around "crowdfunding", "fundraising", "charity", and "internet". During the period 2015-2016, new

keywords emerged, such as "crowdsourcing", "entrepreneurship", "social media", "online community" and "signaling". Further, during 2017-2018, the focus of researchers shifted towards "motivation" which comprised both intrinsic and extrinsic motivation, "social identity theory", and "crowdfunding platforms". The keywords such as

"medical", and "health" were also in focus during the aforesaid period signifying the use of donation-based crowdfunding in the field of healthcare. During 2019-2020, the research in the area became more focused on keywords such as "sustainability", "social entrepreneurship", "information asymmetry", "blockchain", and "success factors". Also, the use of donation crowdfunding to support people during the COVID-19 pandemic led to the growing interest of researchers in the area. Lastly, during 2021-2022, researchers' attention has shifted towards applying the theory of planned behaviour in driving donors' intention to donate, "Islamic finance", the role of trust, and social media platforms (Twitter).

Discussion

An overview of donation-based crowdfunding through a bibliometric study of the literature shows that the area is evolving and is a topic of substantial interest amongst researchers in this area. An increasing number of research papers are being published each year, which highlights the potential of donation-based crowdfunding in funding projects, especially social and welfare-oriented projects. Further, the field of donation-based crowdfunding caters to various subjects, including Business, Management, Accounting, Social Sciences, Economics, Computer Sciences, Medicine, Engineering, and other subjects, which highlights the interdisciplinary nature of the area engulfing the character and technological appeal of the crowdfunding phenomenon.

The citation and co-citation analysis of references reveal that research in the area of donation-based crowdfunding is evolving and focusing on all-round coverage of the topic, including factors affecting the success and failure of the projects, project initiator reputation, problem of information symmetry, factors driving intention to donate, the role of gender, the role of persuasive appeal, the role of signaling, the importance of spatial

proximity and other project characteristics that leads to crowdfunding campaign participation. The citation, co-citation, and co-authorship of authors reveal that Snyder, J., Li, Y., Wang, T., Angin, A.H., and Short, J.C. are the top prominent authors in the field of donation-based crowdfunding, highlighting that research on the given topic is of substantial interest amongst these researchers owing to extensive popularity and use of donation-based crowdfunding in their respective countries.

The bibliographic coupling of sources indicates that "Sustainability" has the highest number of publications (25), followed by "Technological Forecasting and Social Change" (19). The journal "Entrepreneurship Theory and Practice" has the maximum number of citations (1913) in the SCOPUS, highlighting that the articles published in this journal are highly relevant in donation-based crowdfunding. Further, the co-occurrence analysis and thematic progression of the author keywords reveal that the keywords which frequently occur around donation-based crowdfunding are "Social entrepreneurship", "Social Media", "Entrepreneurship". Since 2021-2022 new avenues such as "Theory of Planned Behaviour", "Sentiment", "Islamic Finance", "Intention to Donate", "Trust", "Twitter" have garnered increased attention from scholars and academicians in the area of donation-based crowdfunding.

The citation analysis of the country of publications reveals that the United States leads in terms of the number of publications but eventually, the research in the area of donation-based crowdfunding is engulfing emerging and developing countries due to ease and benefits associated with donation-based crowdfunding and widespread use of it for raising funds.

Contributions

To the best of our knowledge, this bibliometric study exclusively focuses on the broader coverage

of donation-based crowdfunding to date. We have extensively and exhaustively studied the available literature on the topic to identify the prominent work to explore and establish the comprehensive background of the existing research on donation-based crowdfunding that can help future researchers. The study has implications for researchers and academicians in understanding the theoretical foundations of donation-based crowdfunding by shedding light on its various dimensions of it. This bibliometric study will provide directions to future researchers regarding the relevant journals, authors, important keywords, and prominent articles in the domain of crowdfunding. This study will help future researchers to widen their scope in this domain and find new avenues for future research.

Conclusion

This paper provides a comprehensive bibliometric analysis of the literature on donation-based crowdfunding. It attempts to identify the key authors, publications, journals, country of publications, and frequently occurring keywords in the field of donation-based crowdfunding through VOSviewer. The results were analysed based on five bibliometric techniques: co-citation analysis, citation analysis, co-authorship, co-occurrence analysis, and bibliographic coupling.

The area of donation-based crowdfunding has gained accelerated momentum in the last decade primarily because of the ease of procuring funds and the lack of legal restrictions associated with it. It is being extensively used worldwide, spreading its wings across emerging and developing economies. The research in the area of donation-based crowdfunding is still evolving, with new avenues for research exploding over time. Also, the extant literature on the donation model of crowdfunding has gone through a significant transformation, with early studies focusing more on the concept of donation-based crowdfunding to

recent studies that explore the more in-depth phenomenon in order to extract and gain a deeper understanding of the donation-crowdfunding concept. There is an evident shift in the interest of the academic scholars, with earlier researchers focusing more on the descriptive aspect of the field and recent academicians focusing more on quantitative methodologies by highlighting various aspects of donation-crowdfunding campaigns, actors, and characteristics.

Further, this bibliometric study shows that "The dynamics of crowdfunding: An exploratory study" by Mollick, 2014 is the most cited article. Snyder, J. is the most prominent author in the field of donation-based crowdfunding. The bibliographic coupling of sources suggests that the journal "Sustainability" leads in publications, followed by "Technological Forecasting and Social Change". The co-occurrence analysis of author keywords reveals that "Social entrepreneurship", "Social media", and "Entrepreneurship" appear to be the most reoccurring keywords around crowdfunding. The citation analysis of countries reveals that the USA tops the list of countries with the most published articles in donation-based crowdfunding, but research in emerging economies is gaining momentum.

Moreover, we have tried our level best to be as comprehensive and inclusive as possible, but the study might be subjected to a few limitations common in bibliometric studies (Ferrara and Salini, 2012). The bibliometric analysis results are highly affected by the keywords used by the authors to identify the publications. Also, the list of publications derived through the SCOPUS database is based on the search strings chosen by us to identify the studies, which may not be universal. Another limiting factor is that the sample publications used for the bibliometric analysis have been extracted from a single (SCOPUS) database.

Note: Please refer website for the colour version of the figure No. 2,3,4,5,& 6.

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