

Crowdfunding: The End of an Era or a Course Correction? A Bibliometric Analysis

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ABSTRACT

Writing and publishing on crowdfunding has been booming since it began in 2010, till it showed its first decline in 2020. Bibliometric analyses of crowdfunding literature are very few, and the existing ones did not investigate the decline, nor did they try to understand the direction it was taking. Using bibliometric network analysis on Scopus data from 2010-2024, we investigate whether this decline represents a natural evolution of scholarly attention or signals a paradigm shift in the field. Through the lens of Kuhn's paradigm shift theory and citation lifecycle frameworks, we analyze co-authorship networks, citation patterns, and thematic evolution before and after 2020. Our findings reveal three distinct phases in crowdfunding research: emergence (2010-2015), consolidation (2016-2019), and transformation (2020-2024), with the latest phase characterized by greater fragmentation and a shift from financial mechanisms toward sustainability applications. This analysis provides critical insights for researchers, journal editors, and funding agencies navigating the evolving crowdfunding knowledge landscape. We also noted the underutilization of network science by researchers and have made some recommendations to remedy that in order to get better results in future analyses.

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1. INTRODUCTION

In the wake of the 2008 financial meltdown, access to investment financing has become increasingly difficult. With venture capitalists and angel investors significantly reducing the amounts they are willing to commit in support of entrepreneurial projects, thus, entrepreneurs and start-ups found themselves in a bind (Tomczak & Brem, 2013). On the one hand, the lack of historical data, which speaks to performance, limits their ability to access capital provided by investment banks. On the other hand, despite a long list of flaws, funds from venture capitalists and angel investors are no longer flowing the way they once did. All start-ups, SMEs, and entrepreneurial projects began to suffer. One kind in particular suffered most, the environmentally conscious and sustainability-oriented ventures, which always struggled for funding even before 2008 (Vismara, 2019).

As a successful application of crowdsourcing, crowdfunding came as a lifeline for entrepreneurs, and with the rapid development of the internet, coding, and financial technology, it was set for a boom (Rubinton, 2011). By definition, turning to the crowd for funds meant that, instead of one investor bearing all the risk of a new venture, the risk would be spread among many. Start-ups and entrepreneurial ventures carry higher risk than already established businesses, which makes crowdfunding better suited to finance these projects. There are three main arrangements in which crowdfunding is carried out: donation-based, reward-based, and equity crowdfunding (Belleflamme, et al., 2013). In the donation-based crowdfunding, the investors do not expect any reward for their

contributions, financial or otherwise. In the reward-based crowdfunding, the investors are promised a reward, financial or in-kind. However, their contributions are considered passive investments, which do not earn them a seat at the table. Equity crowdfunding, on the other hand, is considered an active investment in which investors hold shares of the venture. As such, with their fate tied to the venture, their input and feedback are well-received and considered. Since the early days of crowdfunding, authors have been interested in writing about it. As the writing increased, the literature over the years included articles, books, book chapters, editorials, and other forms of published works. There were also the non-published works, such as surveys, notes, and conference papers.

The past decade witnessed the meteoric rise of crowdfunding as both a financial innovation and a subject of scholarly inquiry. From Kickstarter's launch in 2009 to the global proliferation of equity and donation platforms, crowdfunding rapidly captured the attention of researchers across business, economics, and computer science. However, bibliometric evidence suggests that research output on crowdfunding has notably declined since 2020, despite the continued growth of the industry itself. This apparent contradiction raises fundamental questions about the evolution of scholarly attention and knowledge production in emerging fields. Research on scientific advancement has long established that scholarly attention follows cyclical patterns, with topics experiencing phases of emergence, growth, maturation, and eventual transformation or decline (Price, 1963; Small, 2006). Kuhn's (1962) influential theory of paradigm shifts provides a framework for understanding how research communities navigate these transitions, moving from periods of "normal science" characterized by incremental advances within established frameworks to revolutionary phases that reorganize knowledge structures. Meanwhile, citation lifecycle theory Garfield (1980), explains how citation patterns reveal the aging and evolution of research domains.

Drawing on these theoretical foundations, this study explores whether the observed decline in crowdfunding research represents a natural maturation of the field, a redirection of scholarly attention, or a more fundamental paradigm shift in how alternative finance is conceptualized and studied. We pose three central research questions:

1. How has the structural organization of crowdfunding research (author networks, institutional collaborations) evolved from 2010-2024, particularly before and after 2020?
2. What thematic shifts in crowdfunding research indicate field maturation or paradigmatic changes during this period?
3. To what extent does citation analysis reveal integration or fragmentation of crowdfunding knowledge as the field evolves?

What the literature was really lacking was a sufficient analysis of the current body of works, as there were only very few bibliometric analyses on crowdfunding. There seems to be an apparent gap when it comes to the very few existing Bibliometrics analyses. Some researchers seem to focus on the technicalities, dynamics, and structural aspects of crowdfunding (Buttice & Ughetto, 2021). While these analyses looked into the literature in terms of how much was written on each of the different types of crowdfunding, they paid little attention to which area of science these writings were published under. This is especially important as it may reveal which sectors of the economy and in the real world is growing more interested in crowdfunding, which may tell us in which direction crowdfunding is headed.

Those researchers who managed to look into which area of science is writing on crowdfunding did so passively (Zhang, et al., 2018). Their analysis, although it covered the subject matter of published works, fell short of tracking the direction in which the literature was going. Another Bibliometrics analysis on crowdfunding, which also fell short of being comprehensive, was that of C. Revert and R. Badillo (2019). They dug deep into equity crowdfunding, which is only one mode

of crowdfunding. Looking into the breakdown of the rapid growth of published works on crowdfunding, there was an obvious research gap that this analysis is aiming to fill. Prior to conducting this analysis, we looked at other Bibliometrics analyses to get insights on how best to attain quality results. Those Bibliometrics analyses, such as Aysan et al. (2021), offered insights into what to look for when conducting Bibliometrics analyses. The growth in publishing on crowdfunding, as this research will show, was not uniform across all sectors. Some areas grew more interested in crowdfunding than others, despite what the numbers of general publications may suggest.

2. THEORETICAL FRAMEWORK

The apparent decline in crowdfunding research post-2020 presents an intriguing case for examining how scholarly knowledge evolves. To interpret this phenomenon, we employ a multi-theoretical framework that draws from complementary perspectives on scientific development, citation patterns, and topic evolution. This integrative approach enables a nuanced understanding of whether the observed patterns represent a temporary fluctuation, natural maturation, or fundamental shift in the field's trajectory.

2.1. Kuhn's Paradigm Shift Theory

This study employs Kuhn's (1962) theory of scientific revolutions as a primary theoretical lens. Unlike positivist views of science as a linear accumulation of knowledge, Kuhn proposed that scientific fields progress through alternating phases of "normal science" and paradigm shifts. During normal science, researchers work within established frameworks, addressing puzzles defined by the dominant paradigm. Eventually, anomalies accumulate that the existing paradigm cannot adequately explain, leading to a crisis and ultimately a revolutionary phase that establishes new foundational assumptions.

Applied to bibliometric analysis, Kuhnian theory suggests that research fields exhibit detectable patterns as they progress through these phases:

- **Pre-paradigmatic Phase:** Characterized by competing schools of thought, diverse methodological approaches, and a lack of consensus on fundamental questions. Bibliometrically, this appears as scattered, disconnected clusters with minimal cross-citation.
- **Normal Science Phase:** Marked by consolidation around shared frameworks, methodological standards, and research questions. Citation networks show dense connections centered on core papers, with high co-citation relationships among canonical works.
- **Crisis Phase:** Distinguished by growing recognition of anomalies and limitations in the dominant paradigm. Bibliometric indicators include fragmentation of previously cohesive networks, emergence of competing clusters, and citation patterns that challenge established authorities.
- **Revolutionary Phase:** Characterized by reorganization around new foundational assumptions. Bibliometrically visible as rapid shifts in citation patterns, terminological evolution, and reconfiguration of research clusters.

Crowdfunding research may exhibit these Kuhnian phases at an accelerated pace due to its connection to rapidly evolving technological and financial innovations. Chen et al. (2009) demonstrated that bibliometric measures can effectively track these transitions, particularly through visualization of structural changes in research networks over time.

2.2. Citation Lifecycle and Knowledge Obsolescence

Complementing Kuhn's framework, we employ citation lifecycle theory Garfield (1980), Nakamoto (1988), and Wang et al. (2015) to interpret temporal patterns in our data. This perspective holds that scientific publications typically follow predictable citation trajectories, rising to peak influence before gradually declining as knowledge becomes incorporated into the field's foundation or is superseded by newer contributions. Price (1965) identified characteristic aging patterns in scientific literature, distinguishing between fields with rapid obsolescence (e.g., physics) versus those with more enduring relevance (e.g., mathematics). The "half-life" concept measures the time required for a publication's citation rate to decline by 50%, providing a quantitative metric for knowledge obsolescence within a field.

Of particular relevance to our analysis is Merton's (1968) concept of "obliteration by incorporation," wherein groundbreaking ideas become so thoroughly integrated into a field's knowledge base that explicit citations to originating works decrease. As Merton observed: "The greater the scientific importance of an idea, the more likely it will be taken for granted, entering into the commonly held stock of knowledge without attribution." This phenomenon may explain apparent declines in crowdfunding research output even as the practical application of concepts continues to expand. Paradoxically, the very success of foundational crowdfunding concepts in permeating broader discourse may contribute to their bibliometric invisibility.

2.3. Topic Maturity and Diffusion Models

Our third theoretical component draws from innovation diffusion and topic maturity models (Rogers, 2003; Small, 2006; Boyack & Klavans, 2010). These frameworks characterize how research topics emerge, gain attention, reach saturation, and eventually transform or decline. The classic S-curve of innovation adoption has been observed in bibliometric studies across numerous disciplines, with research topics typically moving through stages of introduction, growth, maturity, decline, or transformation.

Rogers' (2003) diffusion of innovations theory identifies five adopter categories, innovators, early adopters, early majority, late majority, and laggards, with corresponding phases in the adoption lifecycle. When applied to research topics rather than technologies, these phases manifest in publication patterns:

- **Introduction phase:** A Small number of publications by pioneering researchers exploring novel concepts
- **Growth phase:** Rapid increase in publications as the topic gains legitimacy and attracts mainstream attention
- **Maturity phase:** Publication volume plateaus as core questions are addressed and incremental advances predominate
- **Saturation/transformation phase:** Declining publication volume as the topic either becomes integrated into broader frameworks or faces obsolescence

Small's (2006) work on tracking growth areas in science further refines this model by identifying bibliometric indicators associated with each phase, including clustering patterns, terminology evolution, and boundary-spanning citations. Boyack and Klavans (2010) demonstrated that topic maturation can be visualized through changes in research front coherence over time, with emergent topics showing increasing coherence followed by fragmentation as they specialize or transform.

2.4. Towards an Integrated Theoretical Framework

These three theoretical perspectives, Kuhnian paradigm shifts, citation lifecycle, and topic maturity models, offer complementary lenses for interpreting the observed patterns in crowdfunding research. While they emerge from different intellectual traditions, they converge on several key insights relevant to our analysis:

1. **Temporal dynamics:** All three frameworks recognize that scholarly knowledge follows non-linear evolutionary patterns with distinct phases.
2. **Structural indicators:** Each theory identifies bibliometric signatures associated with different evolutionary stages, enabling empirical assessment through network analysis.
3. **Integration mechanisms:** All three perspectives acknowledge processes through which once-novel concepts become incorporated into broader knowledge structures.
4. **Transformation pathways:** Each framework offers explanations for how research domains evolve beyond their initial formulations, whether through paradigm shifts, incorporation into canonical knowledge, or diffusion across disciplinary boundaries.

By integrating these three theoretical perspectives, we establish a robust framework for interpreting the observed patterns in crowdfunding research. This integrated approach allows us to distinguish between normal fluctuations in scholarly attention and more significant transitions in how the field is conceptualized and studied. As visualized in [Table 1](#), each theory contributes distinct indicators and interpretive insights.

Table 1: Theoretical Integration Matrix

Evolutionary Phase	Kuhnian Indicators	Citation Lifecycle Indicators	Topic Maturity Indicators
Emergence	Competing frameworks, terminological inconsistency	Low citation rates, mainly self-citations	Small isolated clusters, rapid vocabulary evolution
Growth	Consolidation around dominant paradigm	Rising citation rates, emergence of canonical works	Dense interconnected clusters, standardized terminology
Maturity	“Normal science” puzzle-solving	Peak citation impact, stable reference patterns	Thematic specialization, methodological refinement
Transformation	Anomaly recognition, paradigmatic questioning	Citation dilution, incorporation without attribution	Fragmentation into specialized subclusters, boundary-spanning applications

Source: Author’s own.

3. METHODOLOGY

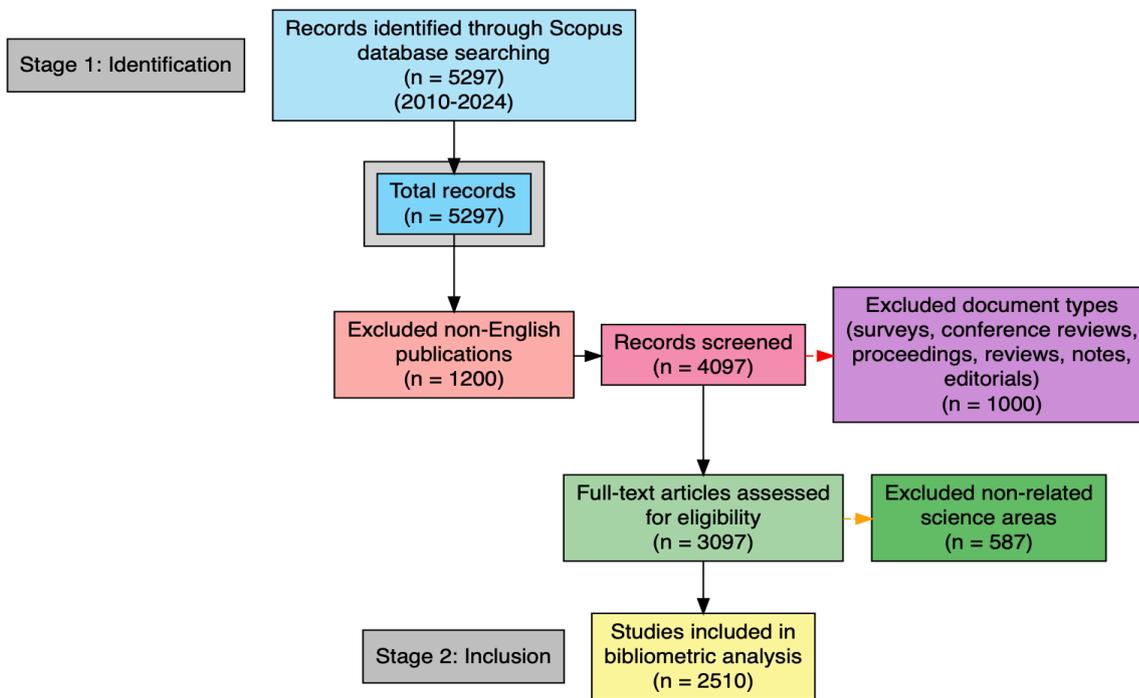
The analyzed data was collected through the Scopus platform, whereby a series of controlled searches produced a large enough dataset for analysis, even after it was refined and filtered. Scopus platform, being one of the most reliable academic platforms, was then used to produce many of the infographics used in the analysis (Montoya et al., 2018). The CSV file generated by Scopus, containing comprehensive bibliographical data, was then downloaded and imported into VosViewer. VosViewer, an analytical tool used to analyze terms and keywords in a data set, was chosen for its user-friendly interface in an effort to establish and visualize connections between bibliographic terms such as authors, citations, and keywords.

The aim of a Bibliometrics analysis is to try and identify a prominent author who published most on the subject, a prominent publication that was cited the most in the scientific community, a dominant journal that published more than the rest on the subject, a dominant institution that most

sponsored research on the subject, or a dominant country where most of the publications were coming out of. Followed by an evaluation of the literature and a general assessment of where it will all go next. We used a combination of techniques such as co-authorship analysis, bibliographical coupling analysis, citation coupling analysis, and co-citation analysis. Each of those techniques will be explained and the extent of its usefulness will also be highlighted.

We collected bibliometric data from the Scopus database, which offers comprehensive coverage of peer-reviewed journals across relevant disciplines, including business, economics, computer science, and social sciences. This search strategy captures various forms of the term “crowdfunding” while focusing on scholarly articles and reviews published in English between 2010 and early 2024. The selection of 2010 as the starting point corresponds to the period immediately following the launch of major platforms like Kickstarter (2009) and Indiegogo (2008), when scholarly attention to the phenomenon began to emerge. Document selection followed the PRISMA protocol (Moher et al., 2009). **Figure 1** presents the PRISMA flow diagram illustrating our selection process, which yielded a final dataset of 2,510 documents after removing duplicates and non-relevant items.

Figure 1: PRISMA Flow Diagram of Document Selection Process



Source: Author’s own.

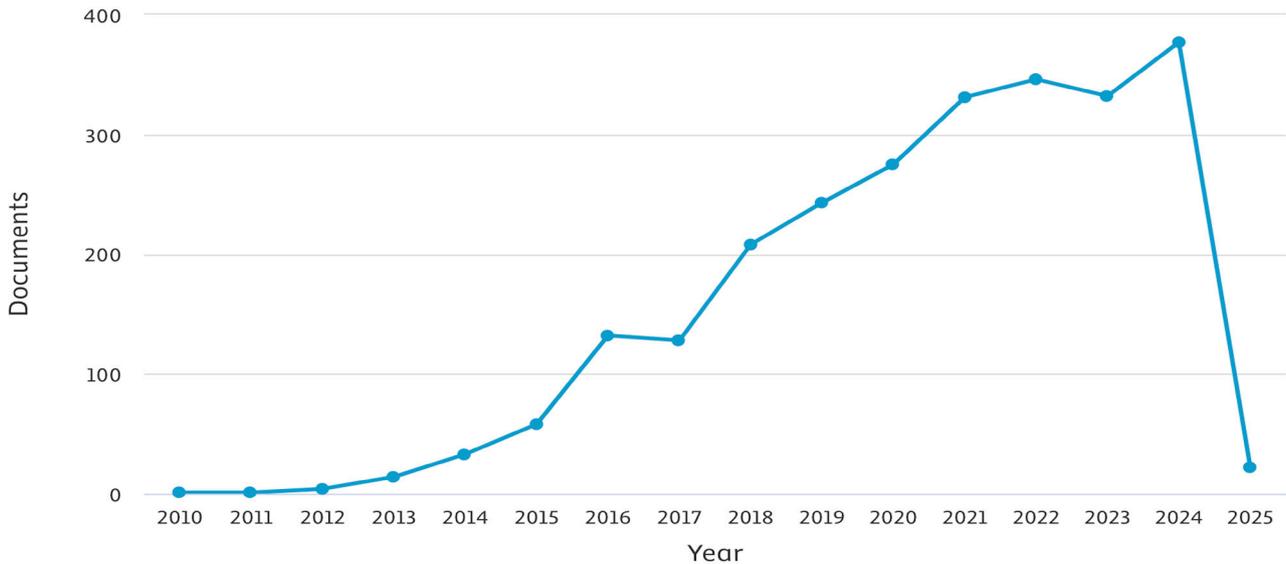
4. DATA AND ANALYSIS

4.1. Refined Results

After a thorough review of the collected data, we decided to optimize the reliability of our findings by filtering out irrelevant data, which we thought was skewing the results in a way that wouldn’t allow the data to tell the story. We limited our results to works published in English, which included the majority of publications. We only included journal articles, books, and book chapters. We decided to exclude areas of science that are not related to the function of crowdfunding, which narrowed our scope to focus on accounting, finance, and economics. This drastically reduced our results from 5297 publications to only 2510, even though we included the entire timeline from 2010 to 2024.

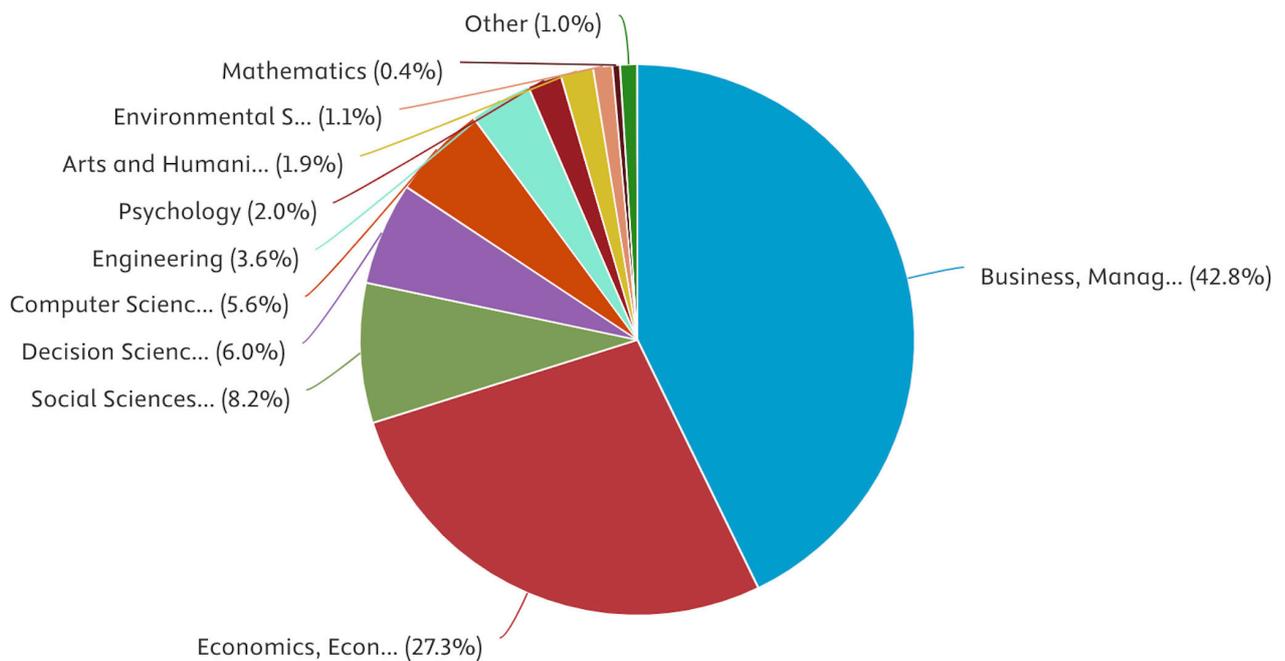
We immediately noticed that the decline in publishing during 2020 did not last. It was followed by a slight recovery in 2021, only to decline in 2022, further decline in 2023, and a sharp recovery in 2024. During 2020, publishing on crowdfunding increased from 243 to 275, representing a decline in growth when compared with previous years. The growth further declined when publications only rose to 331 in 2021. When we applied those filters, the aim was to refine the results by removing the irrelevant ones. Which tells us that publications responsible for the upward trajectory till 2022 were not really related to the function of crowdfunding, and once removed, the publishing on Crowdfunding seems to continue its decline through 2023. The recovery of 2024, however, is worthy of a closer look (Figure 2).

Figure 2: Documents by Year - Refined



Source: Author's own

Figure 3: Documents by Subject Area - Refined

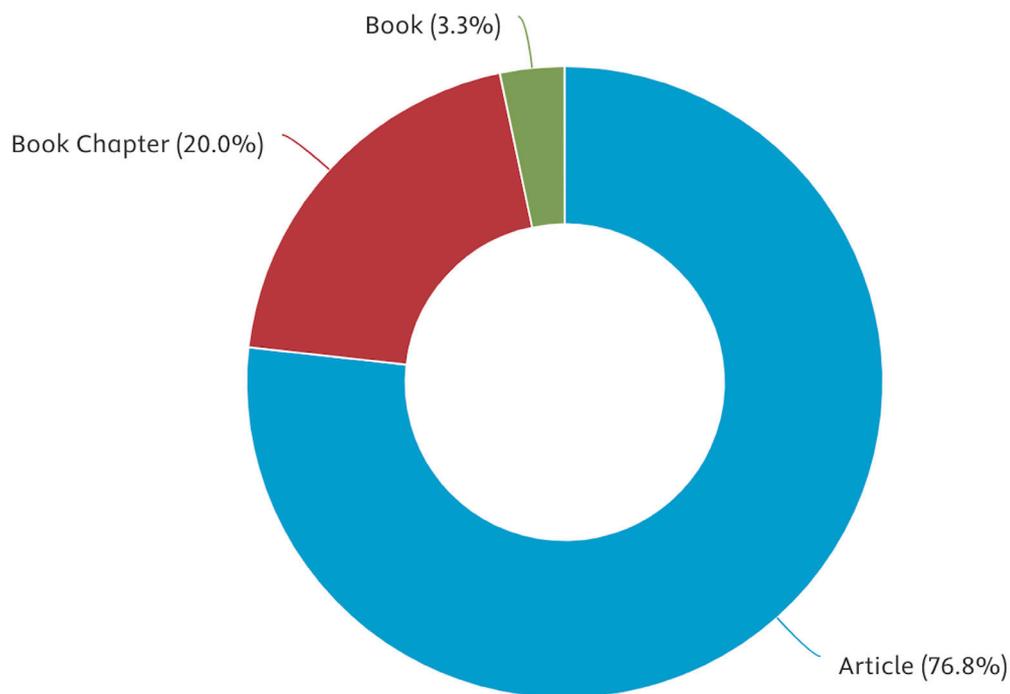


Source: Author's own.

The temporal distribution of crowdfunding publications reveals a characteristic pattern that aligns with Rogers’ (2003) diffusion of innovations model. As shown in **Figure 2**, crowdfunding research emerged in 2010 with just two publications, followed by exponential growth through 2022, where it peaked at 331 publications. This growth curve exhibits the classic S-shaped pattern described in innovation diffusion theory, with an initial period of slow adoption, followed by rapid acceleration, and eventual plateau. When viewed through Kuhn’s framework, this temporal pattern suggests crowdfunding research progressed from a pre-paradigmatic phase (2010-2012) characterized by conceptual exploration, through a period of normal science (2013-2019) marked by substantial growth and consolidation around dominant frameworks, to a potential crisis phase beginning in 2020, where publication volume began to fluctuate and eventually decline.

The disciplinary composition of our refined dataset demonstrates a pronounced concentration within core financial disciplines (**Figure 3**). Accounting and finance publications now constitute 42.8% of the sample, representing a substantial increase from 24.2% in the unrefined dataset. Similarly, economics publications comprise 27.3%, nearly doubling from their initial 15.1% representation. This filtering process eliminates peripheral studies and focuses the analysis on research addressing crowdfunding’s fundamental financial mechanisms.

Figure 4: Documents by Type - Refined



Source: Author’s own.

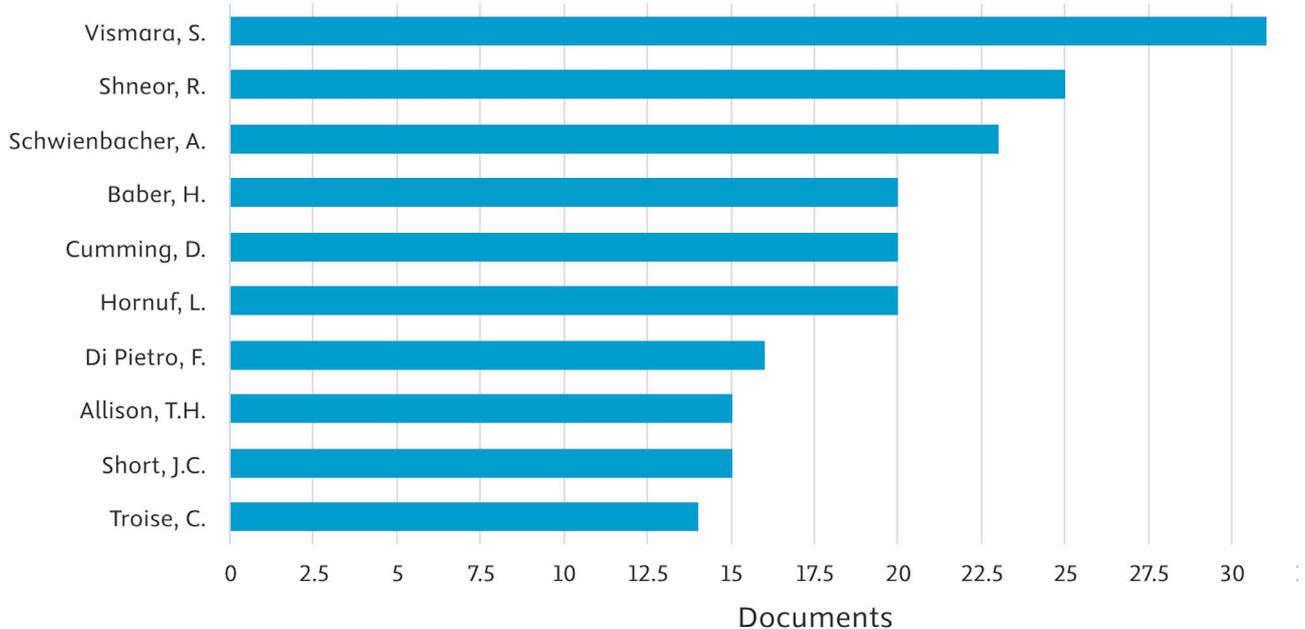
The temporal pattern within this refined dataset reveals important insights into the field’s evolution. The decline observed in 2020, coinciding with the COVID-19 pandemic, was followed by a modest recovery in 2021 before experiencing continued contraction through 2023. However, 2024 exhibits a sharp recovery in publication volume, suggesting resilience rather than obsolescence. This pattern may reflect what Kuhn described as a revolutionary phase, a fundamental reorganization of the field’s intellectual structure rather than decline.

The disciplinary concentration observed in our refined sample, with accounting, finance, and economics collectively representing 70.1% of publications, exemplifies characteristics of what Kuhn termed normal science. During such periods, research converges around shared theoretical

frameworks and established methodological approaches, indicating that crowdfunding has matured from an interdisciplinary curiosity into a legitimate domain within financial economics with well-defined research paradigms and scholarly conventions. Similar to the area of science, the document type chart has been affected by the applied filters. The share of journal articles, when we look at [Figure 4](#), has increased from 58.3% to 76.8%. By the same token, the share of book chapters increased from 12.7% to 20%, and that of books from 2% to 3.3%. This indicates that the results we are about to analyze are now of a much higher academic quality than before, which makes the analysis even more meaningful. The document type analysis of our refined dataset, [Figure 4](#), shows a significant concentration of crowdfunding research in journal articles (76.8%), followed by book chapters (20%) and books (3.3%). This distribution is characteristic of maturing scientific fields, where initial conceptual explorations typically published in books give way to more specialized, incremental advances reported in journal articles.

This pattern can be interpreted through citation lifecycle theory as evidence of knowledge consolidation rather than obsolescence. As foundational crowdfunding concepts become incorporated into the field's intellectual framework, explicit citations to original works may decrease, a phenomenon Merton (1968) termed "obliteration by incorporation." Rather than signaling declining interest, this pattern suggests crowdfunding concepts have matured to the point of entering the field's canonical knowledge base.

Figure 5: Documents by Author - Refined



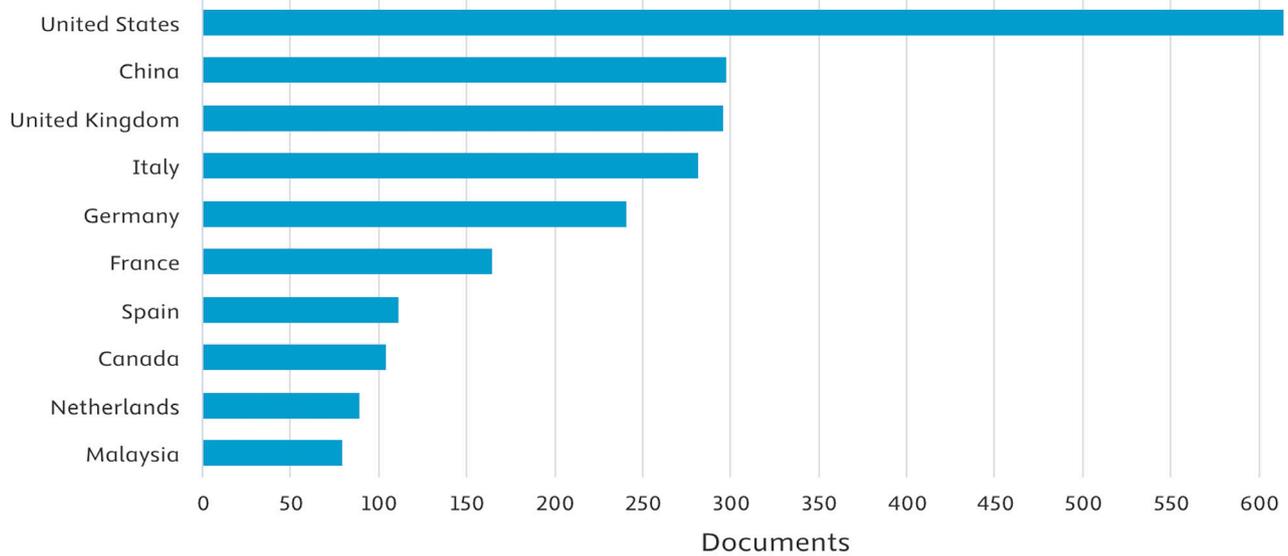
Source: Author's own.

Upon applying our methodological filters, the composition and ranking of the ten most prolific authors shift notably while maintaining concentration among leading scholars ([Figure 5](#)). Vismara retains his dominant position with 31 publications, followed by Schwienbacher, who advances to second place with 23 publications, and Cumming, who secures third place with 20 publications. Hornuf maintains fourth position with 20 publications, while Thomas Allison rounds out the top contributors with 15 publications. These filtering criteria ensure our analysis captures authors whose work addresses the fundamental aspects of crowdfunding rather than peripheral applications.

The network analysis reveals distinct research clusters centered on these prominent scholars, indicating the maturation of crowdfunding as an academic discipline. The observed concentration, with the top three authors contributing 74 publications collectively, reflects the theoretical framework proposed by Price (1963), who documented that scientific fields typically consolidate around

a core group of highly productive researchers during periods of disciplinary development. This pattern suggests that crowdfunding research has evolved from its exploratory phase into a more structured academic domain with established thought leaders driving both theoretical advancement and empirical investigation.

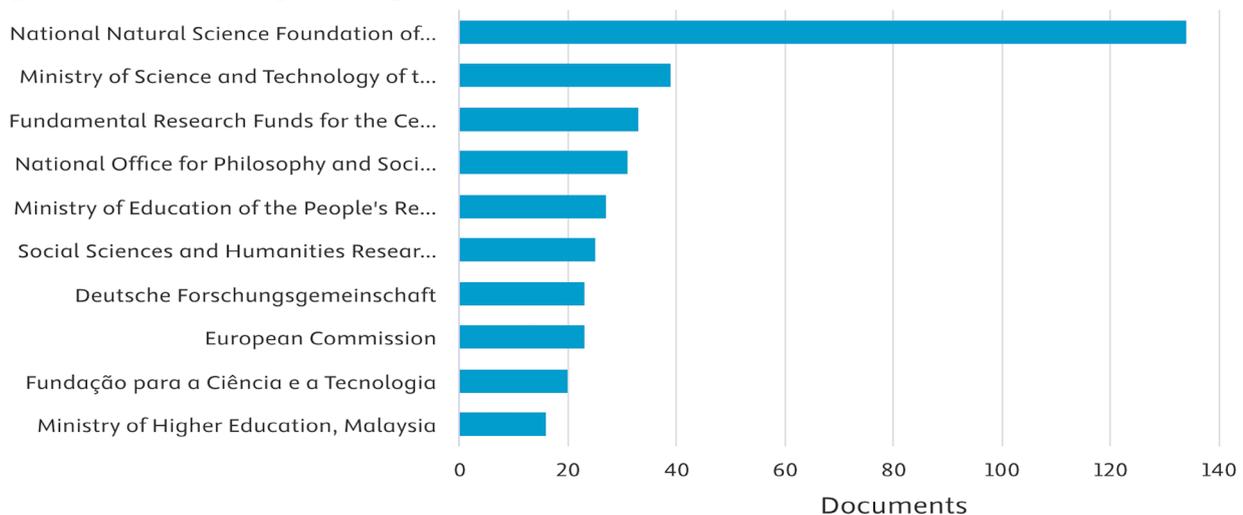
Figure 6: Documents by Country - Refined



Source: Author's own.

The United States remained in the lead, after applying the filters, with 614 publications (Down from 1206), followed by China with 297 (Down from 716), then the United Kingdom with 295 (Down from 481), Italy with 281 (Down from 396), Germany with 240 (Down from 382), France with 164 (Down from 244), Spain with 111 (Down from 228), Canada with 104 (Down from 205), and finally, the Netherlands with 85 (*Figure 6*). The geographical distribution of publications, *Figure 6*, indicates a broader pattern of research diffusion consistent with Rogers' innovation adoption model. The United States leads with 614 publications in the refined dataset, followed by China (297), the United Kingdom (295), and Italy (281). This distribution suggests that crowdfunding research initially concentrated in Western economies where the practice first emerged, before diffusing to emerging economies, particularly China, as the field matured.

Figure 7: Documents by Funding Sponsor - Refined



Source: Author's own.

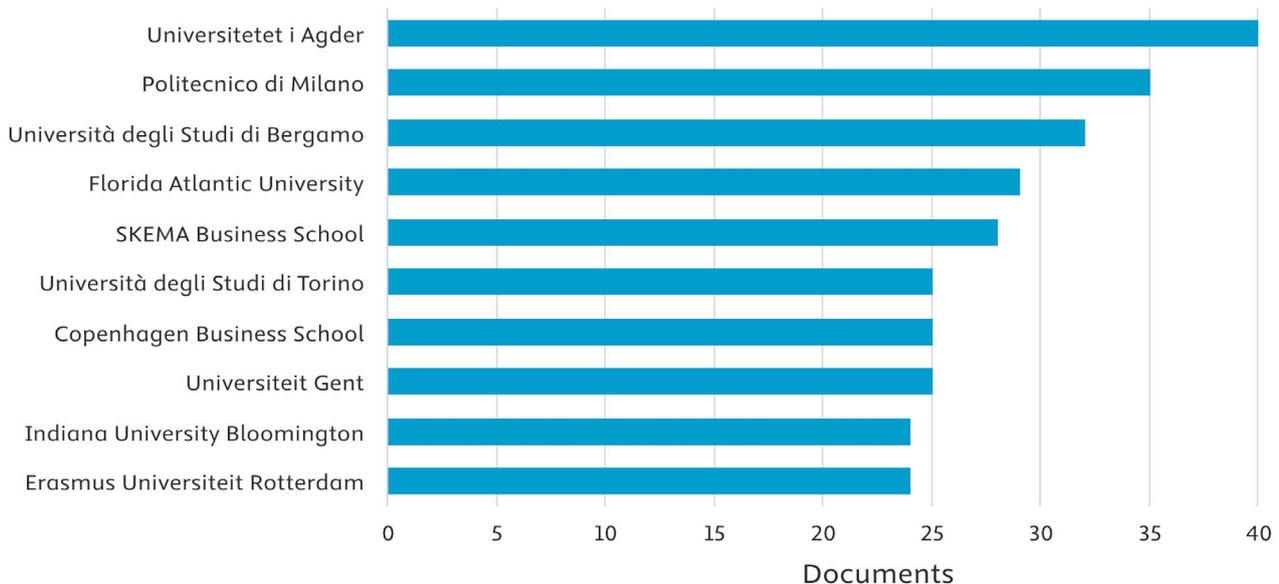
The notable reduction in Chinese publications (from 716 to 297) after refinement suggests that much of China's crowdfunding research focuses on applications and technical implementations rather than core financial mechanisms. This pattern aligns with the topic maturity model's prediction that maturing research areas often fragment into specialized application domains as fundamental concepts become established.

As for the funding sponsors, the story is slightly different. Most members of the top 10 list remained on the list, except one; what we observed is a shuffle of their order on it (*Figure 7*). The National Natural Science Foundation of China and the Ministry of Science of the People's Republic of China, with 134 and 39 (Down from 295, 80) publications respectively, remained in first and second place, allowing China to maintain its leap of dominance in funding crowdfunding research and publications. At the same time, the European Commission dropped to eighth place with 23 publications (Down from 54).

The institutional analysis also reveals an interesting divergence in research focus. While European institutions demonstrate a stronger interest in the fundamental financial mechanisms of crowdfunding, Chinese institutions (particularly through funding sponsors like the National Natural Science Foundation of China) appear increasingly focused on applications rather than mechanisms, potentially signaling a shift toward more specialized research fronts as predicted by topic maturity theory.

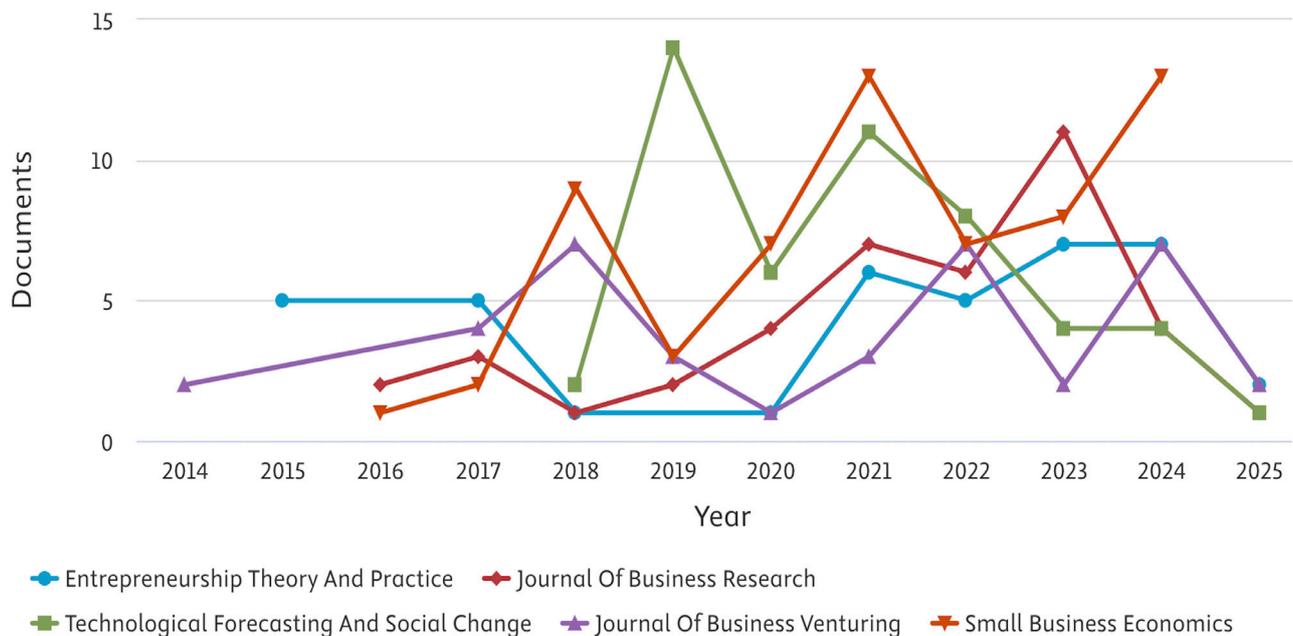
Similar to the funding sponsors, the list of top 10 institutions with which the authors of the published works are affiliated maintained its members, except for four (*Figure 8*). At the top of the list is now Agader University with 40 Authors (Down from 46), while Politecnico di Milano with 35 authors (Down from 47) climbed to second place. The Università degli Studi di Bergamo assumed third place with 32 authors. Florida Atlantic University ranked fourth with 29 authors, and SKEMA Business School in fifth place with 28 authors. Trailing the list was Erasmus Universiteit Rotterdam with 24 authors.

Figure 8: Documents by Institutional Affiliation - Refined



Source: Author's own.

Institutionally, our findings indicate that European universities dominate crowdfunding research, with Agader University (40 affiliated authors), Politecnico di Milano (35), and Università degli Studi di Bergamo (32) forming the top three institutional contributors (*Figure 14*). This geographical concentration suggests the development of what Kuhn termed “invisible colleges”, networks of researchers working within shared paradigmatic frameworks, a characteristic feature of normal science periods.

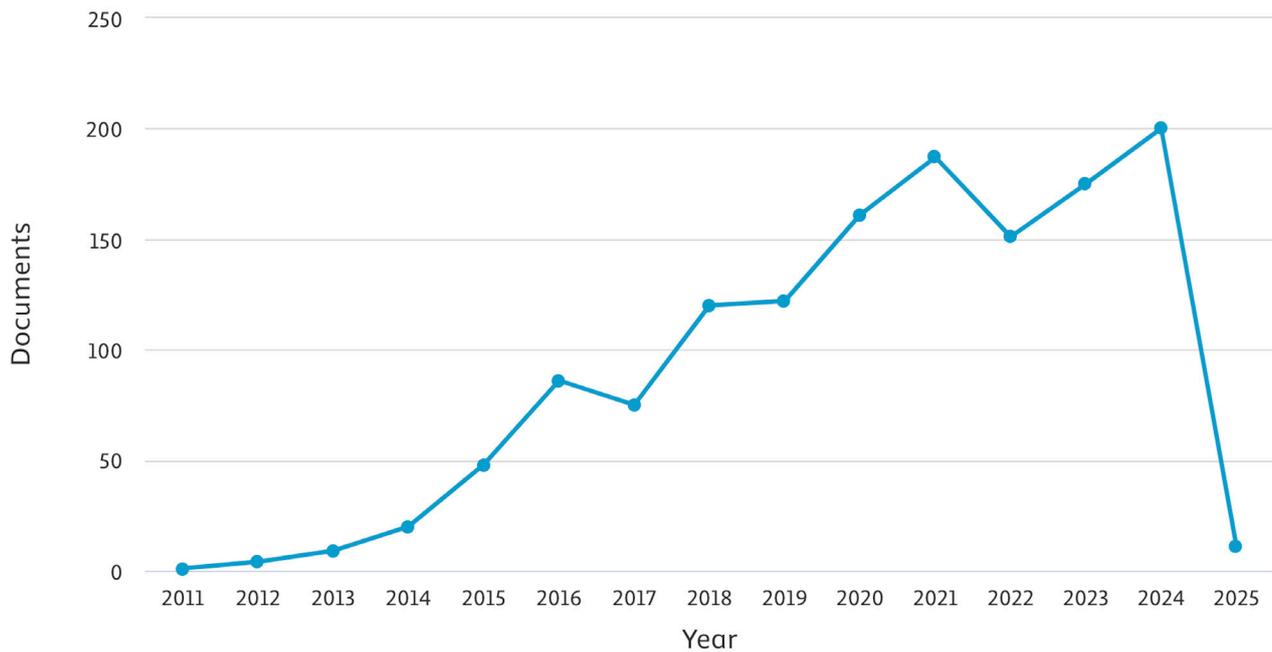
Figure 9: Documents by Publishing Journals - Refined

Source: Author's own.

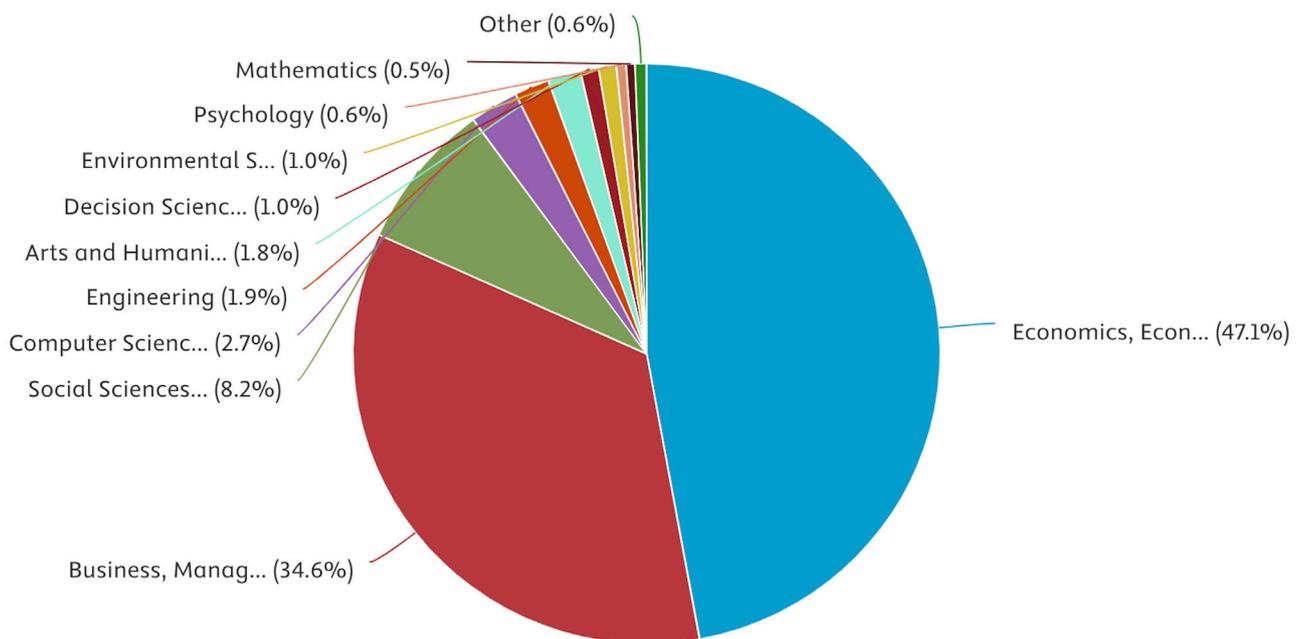
We finally decided to take a closer look at the journals in which these works are published, in order to investigate whether or not they behave in a uniform manner. Meaning, when the publishing on crowdfunding increases or decreases, in a given year, do all areas of the literature follow the same pattern? Or do they behave differently? Our findings were quite interesting, which led to further investigation to confirm our observation. We focused on 2023, the year that saw a general decline in publishing on crowdfunding. We tracked the top 5 journals that publish on crowdfunding, which belong to different areas of science. The aim was to find out if they all followed the trend of decline, which affected the publishing on crowdfunding in general, during the same year.

As per **Figure 9**, *Journal for Business Research*, *Technological Forecasting and Social Change*, and *Entrepreneurship Theory and Practice* all followed the general trend of decline in publishing on crowdfunding. However, *Small Business Economics* broke with the trend and went in the other direction. The journals published more on crowdfunding that year than they did the year before, even as the publications of the other journals were declining. We needed to carry out further investigation, to be able to decide whether this was an isolated case of one journal, or it was the case of a whole area of science doing better than the rest.

An especially revealing finding emerges from our analysis of journal publication patterns, **Figure 9**, as most prominent journals (*Journal of Business Research*, *Technological Forecasting and Social Change*, and *Entrepreneurship Theory and Practice*) showed declining publication volumes on crowdfunding in 2023, while *Small Business Economics*, a journal often focused on entrepreneurial finance and sustainable business models showed an increased output. This divergence suggests the field may be witnessing what Kuhn termed “anomaly recognition,” where existing paradigms prove inadequate to address emerging questions, necessitating new theoretical frameworks. To carry out the investigation, we considered two control variables, sustainability and finance. Finance represented publications on crowdfunding that were published in financial or economic journals, while sustainability represented publications on crowdfunding that were published in environmental and sustainability journals. We examined the time period covering the decline, holding all others constant, in both areas of science separately. Applying such controls was absolutely necessary to get a clearer picture of what direction the crowdfunding literature is really going, and who is growing more interested in crowdfunding.

Figure 10: Documents by Year - Finance-Oriented Publications

Source: Author's own.

Figure 11: Documents by Subject Area - Finance-Oriented Publications

Source: Author's own.

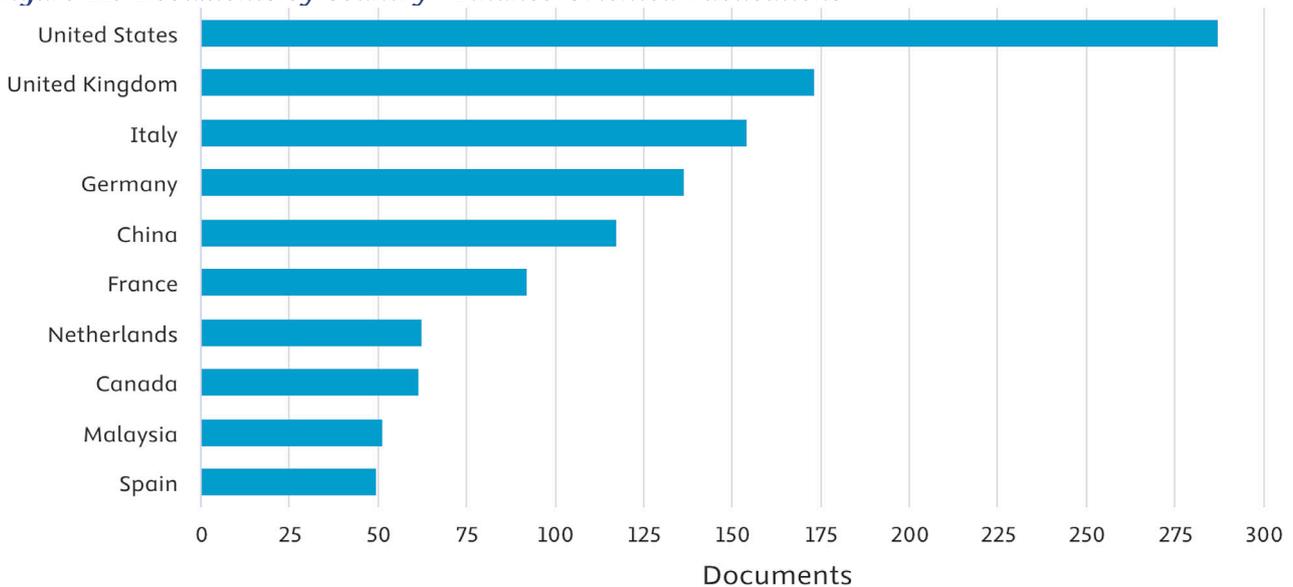
4.2. Controlling for Finance

Our temporal analysis of crowdfunding literature through the lens of economics, finance, and accounting reveals several important patterns (**Figure 10**). Publication volume declined markedly beginning in 2020, coinciding with the COVID-19 pandemic, and continued contracting through 2023. While the pandemic provides a partial explanation for the initial decline, the sustained contraction beyond the pandemic recovery period suggests evolving research priorities within the field. This trend reversed dramatically in 2024, with publication volume surpassing pre-pandemic

levels. The disciplinary refinement process concentrates our sample within core financial disciplines, with finance and accounting publications now comprising 81.7% of the dataset (Figure 11). This concentration facilitates more precise analysis of paradigmatic developments within financial crowdfunding research. Our controlled analysis reveals evidence of a potential paradigmatic shift in progress. Examining publications focused specifically on traditional finance applications versus sustainability-oriented crowdfunding research (Figure 10 to Figure 12) reveals divergent trajectories. Finance-oriented publications exhibit the decline-and-recovery pattern described above, while sustainability applications demonstrate different temporal dynamics. This divergence, when interpreted through Kuhn’s theoretical framework, suggests the field may be experiencing a crisis phase in traditional financial approaches to crowdfunding, followed by conceptual reorganization around emerging themes such as sustainable finance and environmental, social, and governance (ESG) considerations. Such patterns are consistent with periods of scientific revolution, wherein established paradigms face challenges from alternative theoretical frameworks.

It is noteworthy that, when controlling for finance, the United States assumes the lead in publishing on crowdfunding. With 287 publications, the United States is followed by three European countries (the United Kingdom, Germany, and Italy), sending China to fifth place on the list of the top 10 countries that publish most on crowdfunding (Figure 12).

Figure 12: Documents by Country - Finance-Oriented Publications



Source: Author’s own.

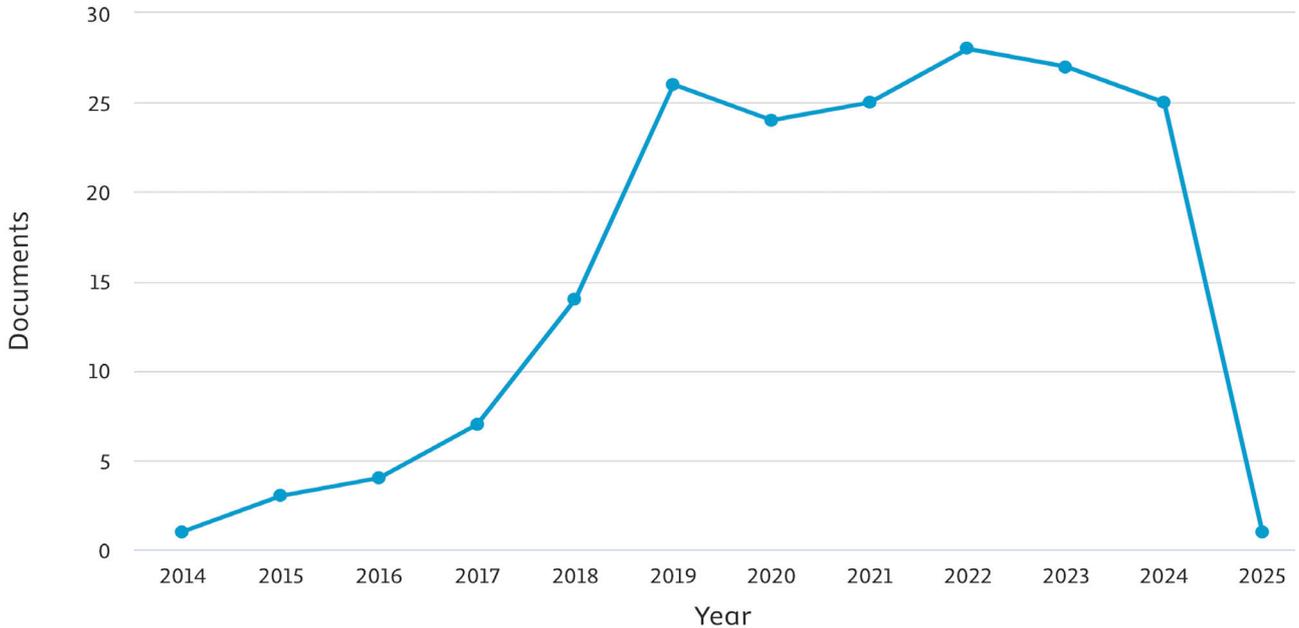
4.3. Controlling for Sustainability

Looking at the crowdfunding literature from the sustainability and environment perspective, keeping all other controls in place, we observe that it follows a different trajectory. Up until 2019, the number of publications was on the rise, then it declined from 26 (in 2019) to 24 (in 2020). Although the publishing decline in 2020 can be explained by the general decline in publishing during COVID-19, the increase in the number of publications in 2021 and 2022 can only be explained by a spike in interest. Interest in publishing on crowdfunding within the context of environmental and sustainability concerns seems to have lessened, as we observe a decline in the number of publications in 2023 and 2024. This indicates that this sector garnered some interest in crowdfunding, up until 2022, and dedicated considerable research to it (Figure 13).

Figure 14 shows an increase in the publishing on crowdfunding, from an environmental and sustainability perspective, to nearly 50% which is only expected considering the controls we applied.

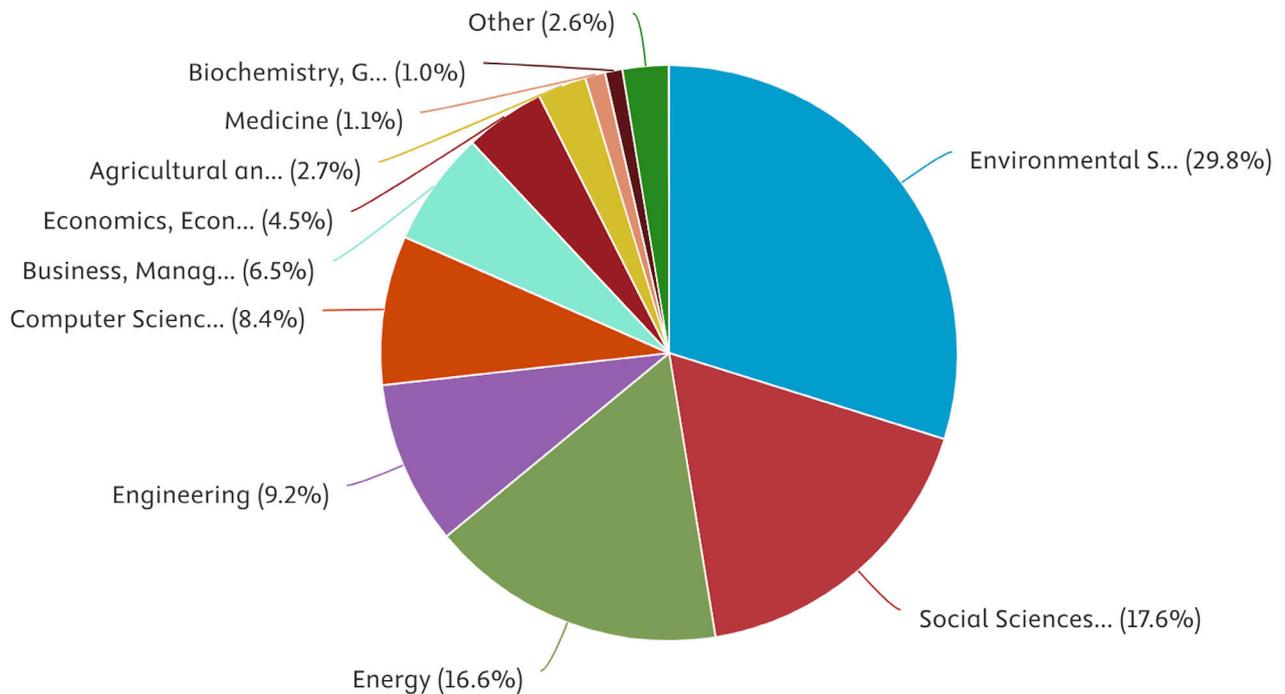
Another interesting observation, when we controlled for sustainability, was to see China assuming the lead worldwide with 40 publications, sending the United Kingdom and Italy to second and third place on the list of top 10 countries that most publish on Crowdfunding, with 21 and 18 publications respectively (*Figure 15*).

Figure 13: Documents by Year - Sustainability-Oriented Publications



Source: Author's own.

Figure 14: Documents by Subject Area - Sustainability-Oriented Publications



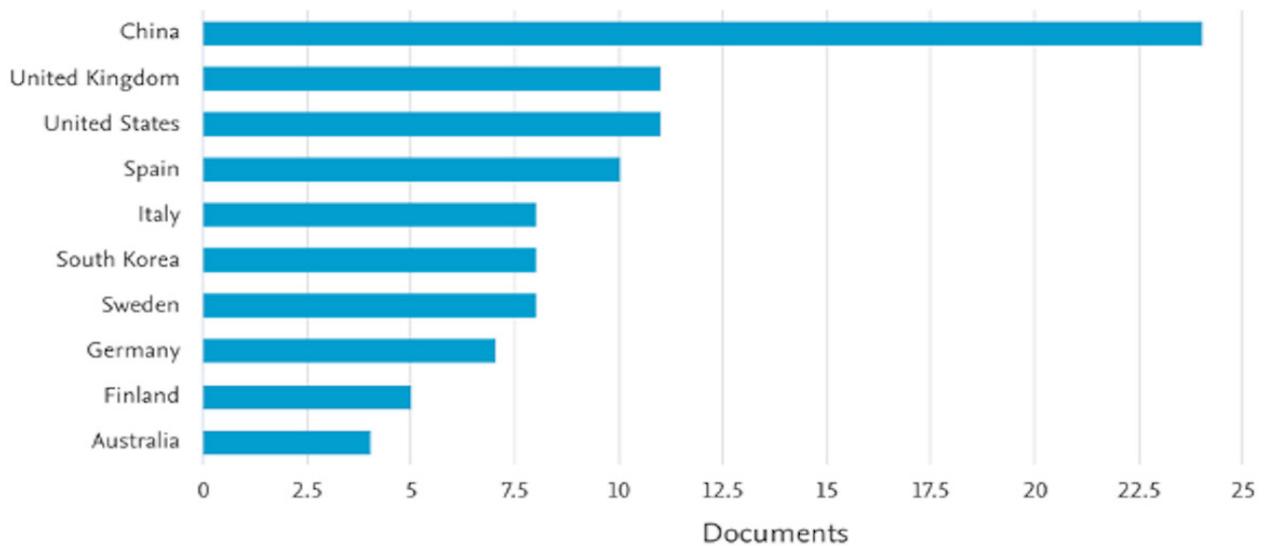
Source: Author's own.

Our controlled variable analysis comparing financial-oriented and sustainability-oriented crowdfunding research provides perhaps the strongest evidence of field transformation rather than decline. When controlling for financial publications, *Figure 10*, we observe a clear decline from 2020 through 2023, followed by a recovery in 2024. This pattern suggests that while traditional financial

approaches to crowdfunding may have reached saturation, new applications, particularly in sustainability domains, are emerging as growth areas. This shift from financial mechanisms to practical applications aligns with Small’s (2006) observation that maturing research topics often transition from theoretical development to application-focused research. Rather than indicating field obsolescence, this pattern suggests crowdfunding research is undergoing what Kuhn would describe as a revolutionary phase, a fundamental reorganization of the field’s intellectual structure around new questions and applications.

Figure 15: Documents by Country - Sustainability-Oriented Publications

Compare the document counts for up to 15 countries/territories.



Source: Author’s own.

The geographical shift in this transformation is particularly notable. While the United States remains dominant in finance-oriented crowdfunding research (287 publications), European countries collectively outpace American contributions, particularly in sustainability applications. This geographical redistribution of research focus suggests not only thematic evolution but potentially competing paradigms emerging in different research communities, a key indicator of Kuhnian paradigm shift in progress (Figure 15).

4.4. Connections Analysis

In order for us to assess the quality of the literature, we employed several analytical techniques such as Co-authorship analysis, Bibliographical coupling analysis, Co-citation coupling analysis, and Keyword analysis, such as Co-occurrence analysis. All of these analytical tools, which will be explained separately, aim to examine the strength, solidity, connectivity, and collaborations within the literature. Some of these techniques will focus on the authors of those published works, while the focus of others will be on the works themselves and the interactions and connections between them.

For each of these techniques, there is a term that has been defined as Total Link Strength (TLS), which is calculated to rank the results based on the aspects the technique is meant to gauge. Occasionally, when called for, we would calculate averages to get a better reading of the results. Additionally, to keep the analysis focused, we limited our results to the top 15 or 20 and presented them in tables. We then used VosViewer to generate a connection map for each of the techniques, and along with the tables, those visualizations make the foundations of our findings. To assess the qualitative dimensions of crowdfunding literature’s evolution, we employed multiple network analysis

techniques that reveal structural patterns consistent with the theoretical frameworks established at the outset of this research. Each analytical approach illuminates different aspects of the field's maturation and potential paradigmatic transitions.

4.4.1. Co-Authorship

It is an analytical tool, the focus of which is the author, that ranks the authors based on their collaborations with other authors. Essentially, Co-authorship analysis denotes the number of different co-authors an author has (Zhang & Glanzel, 2012). According to Beaver & Rosen (1979), a higher value of the Co-authorship term is associated with a higher productivity of these authors and higher collaborations between them. Higher values of the term Co-authorship are also indicative, as per Frame & Carpenter (1979), of higher international collaborations. In other words, high co-authorships reflect a thriving and more productive publishing area of science, and a common and shared interest in that area of science among scientists and authors from different parts of the world.

Table 2: Co-Authorship Analysis

Author	Documents	Citations	Total Link Strength
Vismara, Silvio	31	3050	33
Allison, Thomas H.	15	1436	32
Short, Jeremy C.	15	1627	29
Anglin, Aaron H.	12	732	22
Cumming, Douglas	20	2100	22
Shneor, Rotem	10	432	20
Meoli, Michele	25	546	18
Benlian, Alexander	9	505	17
Thies, Ferdinand	9	493	17
Wolfe, Marcus T.	11	315	17
Efrat, Kalanit	9	126	15
Gilboa, Shaked	8	89	14
Mckenny, Aaron F.	7	606	14
Davis, Blakley C.	6	1368	13
Sahayam, Arvin	9	355	13

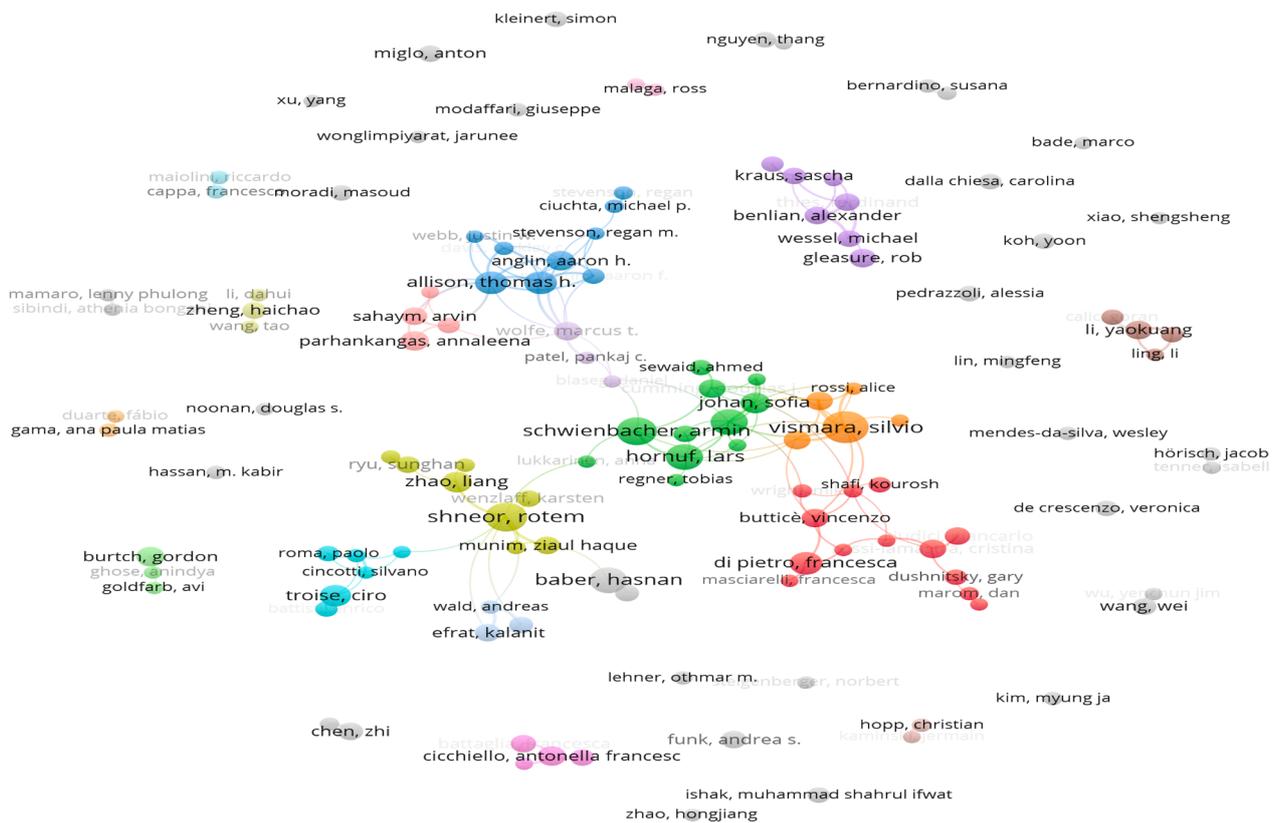
Source: Author's own.

Co-authorship analysis ([Table 2](#)) reveals the collaborative structures within the crowdfunding research community, providing insight into what Kuhn described as the social organization of scientific knowledge production. Through this lens, we can identify whether the field exhibits the cohesive researcher networks characteristic of “normal science” or the fragmented, competing schools of thought typical of paradigmatic transitions. Our analysis reveals that co-authorship patterns do not simply follow publication productivity or citation impact. For example, while Silvio Vismara leads in both publication count (31) and total link strength (33), Douglas Cumming ranks fifth in co-authorship connectivity despite having the second-highest publication count (20). This suggests multiple collaborative clusters rather than a single dominant research paradigm, a pattern consistent with Kuhn's description of a field approaching paradigmatic transition.

The results of our Co-authorship analysis, presented in [Table 2](#), show that the TLS score of the top 15 authors ranges between 13-33. We also observe that the TLS score does not follow the number of documents published by an author, nor does it follow the number of times those documents have been cited. We see that Silvio Vismara, who published 31 documents, which were cited 3050 times,

ranks first with a TLS score of 33. At the same time, while Thomas H. Allison who published 15 documents that were cited 1436 times ranks 2nd with a TLS score of 32, Douglas Cumming who published 20 documents that were cited 2100 times ranks 5th with a TLS score of 22. We considered the average citation per document, only to find that the TLS score does not follow that either. The highest average citation per document is recorded for Blakley C. Davis, with 228. However, he ranked 14th on the TLS scale, while the lowest average of 21.84 was recorded for Michele Meoli, who ranked 7th. **Figure 16** visualizes these results in the form of clusters and links.

Figure 16: Co-Authorship Analysis



Source: Author’s own.

The visualization in **Figure 16** further illustrates this pattern, showing distinct collaborative clusters with relatively few cross-cluster connections. Through our theoretical framework, these patterns suggest that crowdfunding research has progressed beyond the consolidation phase of “normal science” (characterized by unified research communities) toward a more fragmented structure indicative of emerging alternative frameworks.

4.4.2. Citation by Author

Our Citation by Author analysis shows that, when setting the limit of the minimum number of documents published by an author to 5, out of the 4688 authors, only 128 meet such a condition. These results were organized into 13 clusters, connected by 2514 links, and have a TLS of 7739. **Table 3** presents the top 15 results in descending order of TLS. When we considered the TLS scale, Silvio Vismara ranked first with a score of 1044, while Sunghan Ryu ranked last, scoring only 227. Similarly, Schwienbacher climbed to the top of the list when we considered the number of citations as a measure, with 3321 citations, while Ryu remained at the bottom of the list with only 294 citations. We got a different order when we considered the number of documents published by an author, where Vismara assumed the top with 31 documents, while A. Ghose ranked last with 5 documents only. We then decided to calculate the average citation per document, which gave the lead to Avi Goldfarb

with 298.4 citations per document, and sent Rotem Shneor to last place with only 17.36 citations per document.

Table 3: Citations by Author

Author	Documents	Citations	Total Link Strength
Vismara, Silvio	31	3054	1044
Schwienbacher, Armin	23	3321	1023
Hornuf, Lars	20	1357	560
Goldfarb, Avi	5	1492	397
Shneor, Rotem	25	434	350
Vanacker, Tom	10	455	342
Burtch, Gordon	12	2009	334
Cumming, Douglas	20	2102	321
Troise, Ciro	14	371	297
Rossi-Lamastra, Cristina	10	1464	291
Ghose, Anindya	5	1390	271
Zheng, Haichao	8	862	257
Meoli, Michele	10	548	243
Johan, Sofia	13	478	230
Ryu, Sunghan	8	294	227

Source: Author's own.

Citation patterns reveal important insights about knowledge lifecycle dynamics in crowdfunding research. The substantial variation in average citations per document, from Goldfarb's 298.4 to Shneor's 17.36, suggests uneven knowledge absorption across different research streams. Through the lens of citation lifecycle theory Garfield (1980), this pattern indicates that some aspects of crowdfunding knowledge have reached maturity and integration, while others remain in earlier developmental stages. The disparity between productivity and citation impact (e.g., Goldfarb's high impact despite relatively few publications) further supports the interpretation that crowdfunding research has entered what Small (2006) described as the transformation phase, wherein established knowledge becomes integrated into broader frameworks while new research directions emerge.

4.4.3. Bibliographic Coupling

With the next two analytical techniques, Bibliographic Coupling and Co-citation Coupling, we shift the focus of analysis away from the authors to the documents. With Bibliographic Coupling, the aim is to assess how weakly or strongly two documents are connected. Bibliographic coupling analysis provides insight into the intellectual foundation and cohesion of the field by identifying shared reference patterns among publications. This approach is particularly valuable for detecting what Kuhn termed "normal science" (characterized by shared intellectual foundations) versus emerging competing paradigms.

When two works reference a third common work, they are considered bibliographically coupled (Kessler, 1963). The higher the number of common works two works have, the higher the strength of the coupling. It is noteworthy to illustrate the difference, as per [Figure 17](#), between Bibliographic Coupling and Co-citation Coupling. Whereby in the latter, one work cites two works.

To generate the results presented in [Table 4](#), we set the minimum citations per document to 20, in order to only get prominent works. As a result, we generated 655 documents, organized in 17 clusters, connected by 128742 links, and have a TLS score of 344530. We limited our analysis to the top 15 documents, listed in descending order according to TLS score. In first place was a document

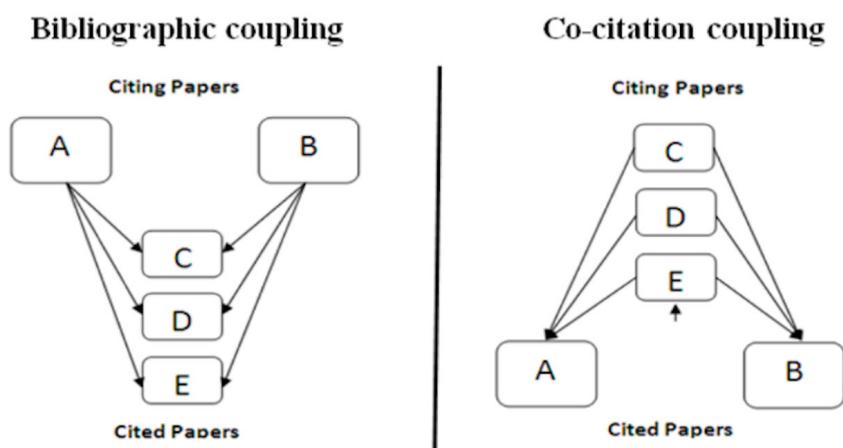
by A. Hoegen, published in 2018, which was cited 73 times, and had a TLS score of 3363. Hoegen’s document was followed by Butticé, published also in 2018, cited 28 times, and has a TLS score of 3315. In last place was a document by Cicchiello, which was published in 2019, was cited 20 times, and has a TLS score of 2637. The bibliographic coupling results reveal strong interconnections among recent publications, with consistent reference patterns across the top-cited documents. This suggests that despite the post-2020 decline in publication volume, crowdfunding research maintains a coherent intellectual foundation, a characteristic that Kuhn associates with mature fields rather than those undergoing revolutionary change.

Table 4: Bibliographic Coupling

Document	Citations	Total Link Strength
Hoegen (2018)	73	3363
Butticé (2018)	28	3315
Clauss (2020)	28	3214
Messeni Petruzzelli (2019)	140	3191
Cai (2021)	78	3171
Bagheri (2019)	136	2989
Cappa (2023)	30	2848
Alegre (2021)	35	2822
Moysidou (2020)	81	2810
Hervé (2018)	66	2785
Lehner (2019)	28	2731
Polzin (2018)	116	2720
Bento (2019a)	86	2710
Cappa (2021)	70	2701
Cicchiello (2019a)	20	2637

Source: Author’s own.

Figure 17: Bibliographic Coupling Vs Co-Citation Coupling



Papers A and B are bibliographically coupled because they have cited papers C, D and E in their reference list.

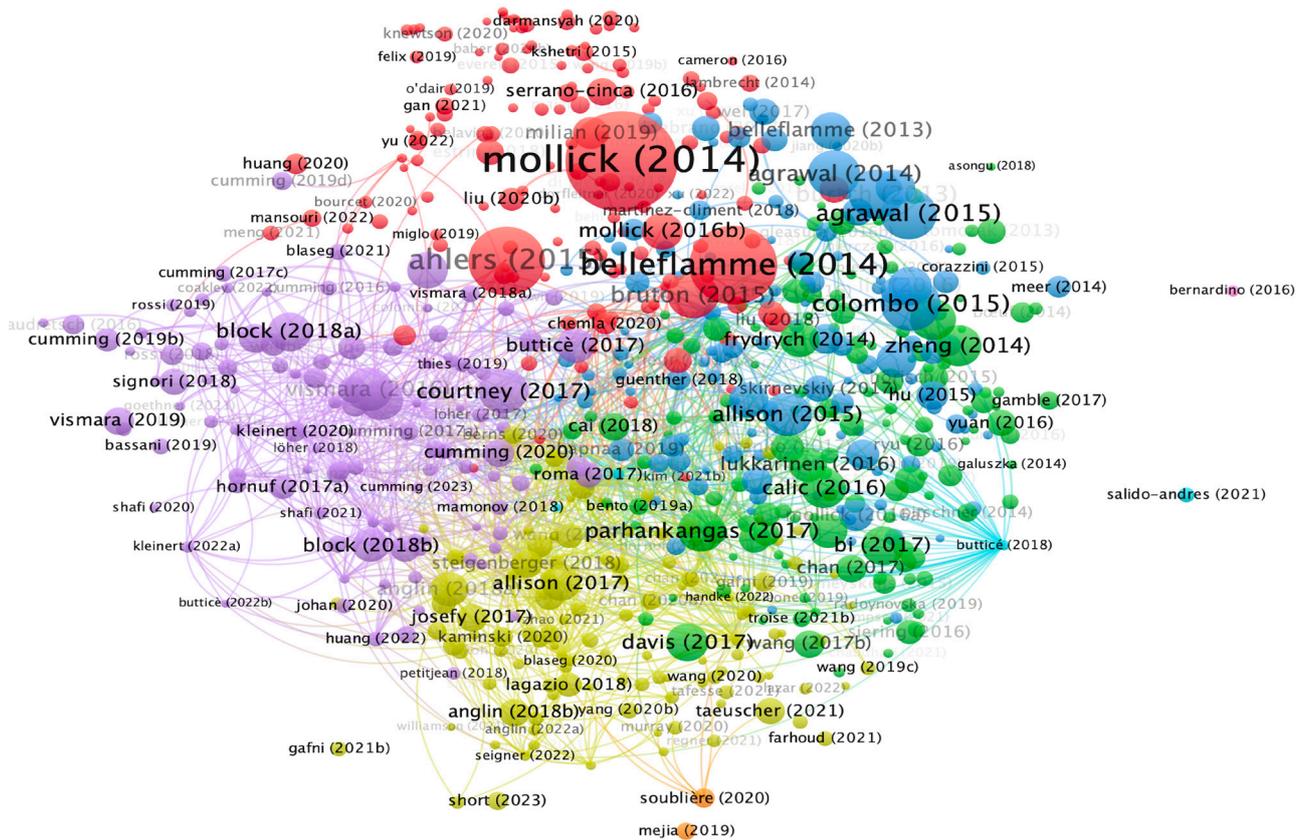
Papers A and B are associated because they are co-cited in the reference list of papers C, D, and E

Source: Kessler (1963).

VosViewer analysis reveals a highly concentrated network structure dominated by a single large cluster containing the majority of publications and citation links. This concentration necessitated generating **Figure 18**, a detailed visualization focusing specifically on this dominant cluster to better

examine its internal structure. The visualizations in [Figure 22](#) and [Figure 23](#) further confirm this pattern, demonstrating the overwhelming dominance of one central cluster relative to smaller peripheral groupings. This network structure indicates what Small (2006) described as topic maturation rather than intellectual fragmentation. The existence of one large, densely connected cluster suggests that crowdfunding research has coalesced around shared theoretical frameworks and methodological approaches characteristic of mature academic fields. However, the presence of smaller peripheral clusters visible in the network analysis suggests early signs of intellectual diversification that may eventually evolve into distinct research streams, potentially indicating the field's transition toward greater theoretical sophistication and methodological specialization.

Figure 18: Bibliographic Coupling-Detailed



Source: Author's own.

4.4.4. Co-Citation Coupling

Co-citation analysis reveals how the field's canonical knowledge structure has evolved over time, providing insight into what Kuhn described as the "exemplars" that define a scientific paradigm.

The analytical technique of Co-citation Coupling was introduced by Henry Small in 1973 to better assist in subject similarity and, ultimately, literature unity. Unlike the case in bibliographic Coupling, Co-citation Coupling occurs when two documents appear in the references of a third document, and they would then be considered co-cited (Small, 1973). The higher the number of co-citations, the stronger the connection between the literature.

To generate the results presented in [Table 5](#), we set the limit of minimum citations per document to 20, which would exclude less cited works, which improves the quality of the results. The analysis, having applied the said limit, then generates 272 documents, grouped in 7 clusters, connected by 20638 links, and has a TLS score of 85446. Our co-citation analysis reveals a highly structured knowledge base dominated by a few canonical works. Mollick's (2014) and Belleflamme et al.'s (2014)

papers emerge as the intellectual cornerstones of the field, with extraordinarily high co-citation strengths (7270 and 5691, respectively) that far exceed other references. This pattern of knowledge organization, with clear exemplars and hierarchical citation structures, aligns with what Kuhn described as the “normal science” phase of scientific development, wherein a field operates within an established paradigm.

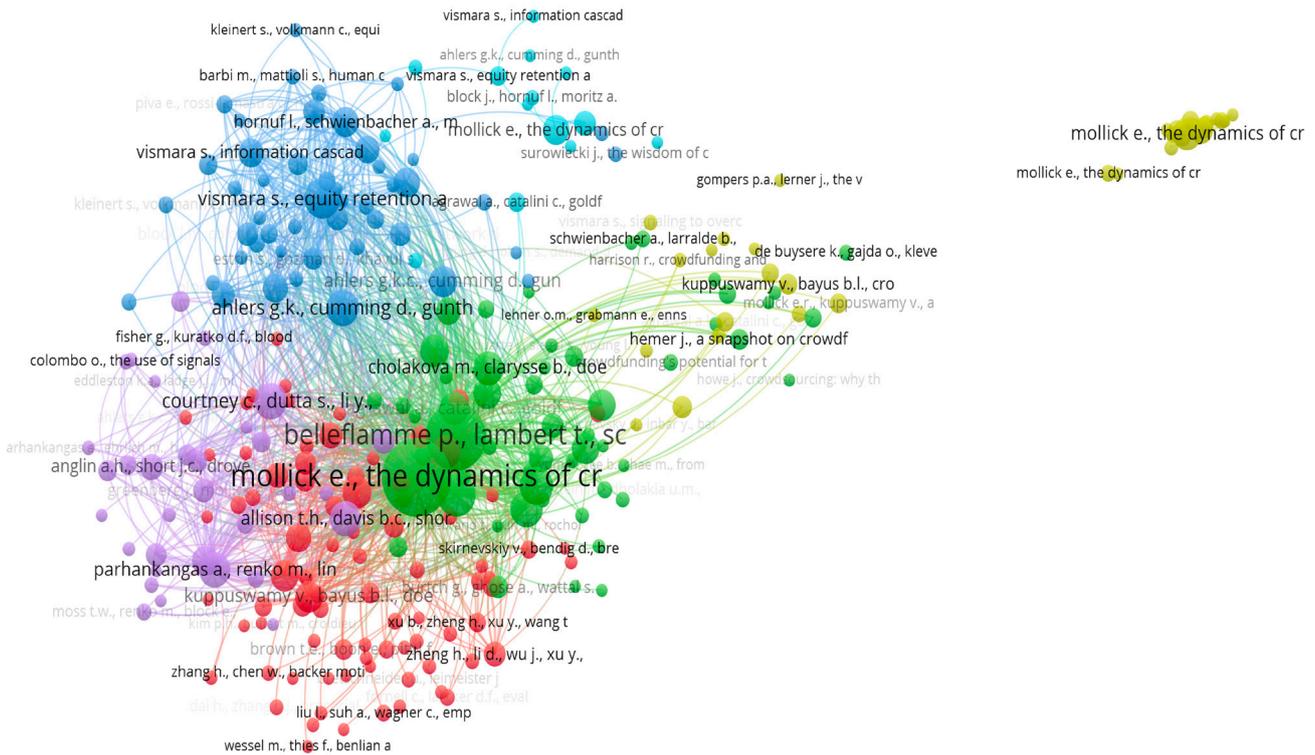
Table 5: Co-Citation Coupling

Total Link Strength	Citations	Author Reference
7270	702	Mollick E., The Dynamics Of Crowdfunding: An Exploratory Study, Journal Of Business Venturing, 29, 1, Pp. 1-16, (2014)
5691	514	Belleflamme P., Lambert T., Schwienbacher A., Crowdfunding: Tapping The Right Crowd, Journal Of Business Venturing, 29, 5, Pp. 585-609, (2014)
3400	215	Colombo M.G., Franzoni C., Rossi-Lamastra C., Internal Social Capital And The Attraction Of Early Contributions In Crowdfunding, Entrepreneurship Theory And Practice, 39, 1, Pp. 75-100, (2015)
2767	185	Vismara S., Equity Retention And Social Network Theory In Equity Crowdfunding, Small Business Economics, 46, 4, Pp. 579-590, (2016)
2611	159	Ahlers G.K., Cumming D., Gunther C., Schweizer D., Signaling In Equity Crowdfunding, Entrepreneurship Theory And Practice, 39, 4, Pp. 955-980, (2015)
2585	151	Courtney C., Dutta S., Li Y., Resolving Information Asymmetry: Signaling, Endorsement, And Crowdfunding Success, Entrepreneurship Theory And Practice, 41, 2, Pp. 265-290, (2017)
2341	140	Parhankangas A., Renko M., Linguistic Style And Crowdfunding Success Among Social And Commercial Entrepreneurs, Journal Of Business Venturing, 32, 2, Pp. 215-236, (2017)
2248	139	Allison T.H., Davis B.C., Short J.C., Webb J.W., Crowdfunding In A Prosocial Microlending Environment: Examining The Role Of Intrinsic Versus Extrinsic Cues, Entrepreneurship Theory And Practice, 39, 1, Pp. 53-73, (2015)
2139	158	Burtch G., Ghose A., Wattal S., An Empirical Examination Of The Antecedents And Consequences Of Contribution Patterns In Crowd-Funded Markets, Information Systems Research, 24, 3, Pp. 499-519, (2013)
2088	133	Cholakova M., Clarysse B., Does The Possibility To Make Equity Investments In Crowdfunding Projects Crowd Out Reward-Based Investments?, Entrepreneurship Theory And Practice, 39, 1, Pp. 145-172, (2015)
2070	169	Ordanini A., Miceli L., Pizzetti M., Parasuraman A., Crowd-Funding: Transforming Customers Into Investors Through Innovative Service Platforms, Journal Of Service Management, 22, 4, Pp. 443-470, (2011)
1935	118	Kuppuswamy V., Bayus B.L., Does My Contribution To Your Crowdfunding Project Matter?, Journal Of Business Venturing, 32, 1, Pp. 72-89, (2017)
1869	127	Agrawal A., Catalini C., Goldfarb A., Crowdfunding: Geography, Social Networks, And The Timing Of Investment Decisions, Journal Of Economics & Management Strategy, 24, 2, Pp. 253-274, (2015)
1815	106	Allison T.H., Davis B.C., Webb J.W., Short J.C., Persuasion In Crowdfunding: An Elaboration Likelihood Model Of Crowdfunding Performance, Journal Of Business Venturing, 32, 6, Pp. 707-725, (2017)
1790	106	Lukkarinen A., Teich J.E., Wallenius H., Wallenius J., Success Drivers Of Online Equity Crowdfunding Campaigns, Decision Support Systems, 87, Pp. 26-38, (2016)

Source: Author's own.

Once more, we limited our analysis to the top 15 documents of our results and listed them in descending order according to their TLS scores. Coming first was an article by E. Mollick, which was published in 2014, was cited 702 times, and had a TLS score of 7270. It was followed by an article by P. Belleflamme, T. Lambert, and A. Schwienbacher. It was published in the same year, cited 514 times, and had a TLS score of 5691. In last place was an article by Lukkarinen A., Teich J.E., Wallenius H., Wallenius J. It was published in 2016, cited only 106 times, and had a TLS score of 1790. It is worth mentioning that, if we rank the results according to the number of citations, the first two would still hold their places as first and second. Additionally, the last place would still be held by Lukkarinen A., Teich J.E., Wallenius H., Wallenius J.

Figure 19: Co-Citation Coupling - Detailed



Source: Author's own.

Table 6: Keyword Analysis

Keyword	Occurrences	Total Link Strength
Crowdfunding	1213	3312
Crowdsourcing	325	1742
Finance	114	695
Equity Crowdfunding	226	641
Entrepreneurship	178	588
Investments	91	584
Entrepreneurial Finance	156	559
Fintech	122	421
Innovation	82	360
Reward-Based Crowdfunding	102	328
Commerce	48	301
Fundings	45	289
Venture Capital	62	283
Entrepreneur	52	279
Investment	47	274

Source: Author's own.

Our Co-citation Coupling analysis revealed a network structure dominated by a single large cluster containing the majority of data and connections, necessitating the generation of **Figure 19** as a detailed illustration of this primary cluster. The results from Co-authorship, Bibliographic Coupling, and Co-citation analyses, as presented in the tables and connection maps, demonstrate that crowdfunding literature exhibits strong connectivity, thematic unity, and extensive collaborative networks among researchers.

The visualization in **Figure 19** reveals an important structural nuance, while the field maintains clearly established canonical references, these are organized into distinct clusters representing

which confirms our findings that the literature on crowdfunding is quite focused and unified on the subject. The co-occurrence patterns largely mirror the keyword frequency distribution, with core financial and entrepreneurial terms dominating the semantic landscape. This consistency between occurrence and co-occurrence patterns suggests what Small (2006) described as conceptual maturity, the establishment of stable semantic associations that characterize a field's knowledge structure.

Table 7: Co-Occurrence Analysis

Keyword	Occurrences	Total Link Strength
Crowdfunding	1213	2347
Crowdsourcing	325	1227
Finance	114	495
Entrepreneurship	178	470
Equity Crowdfunding	226	470
Investments	91	434
Entrepreneurial Finance	156	418
Fintech	122	324
Innovation	82	282
Reward-Based Crowdfunding	102	237
Commerce	48	229
Funding	45	220
Venture Capital	62	220
Entrepreneur	52	208
Investment	47	192

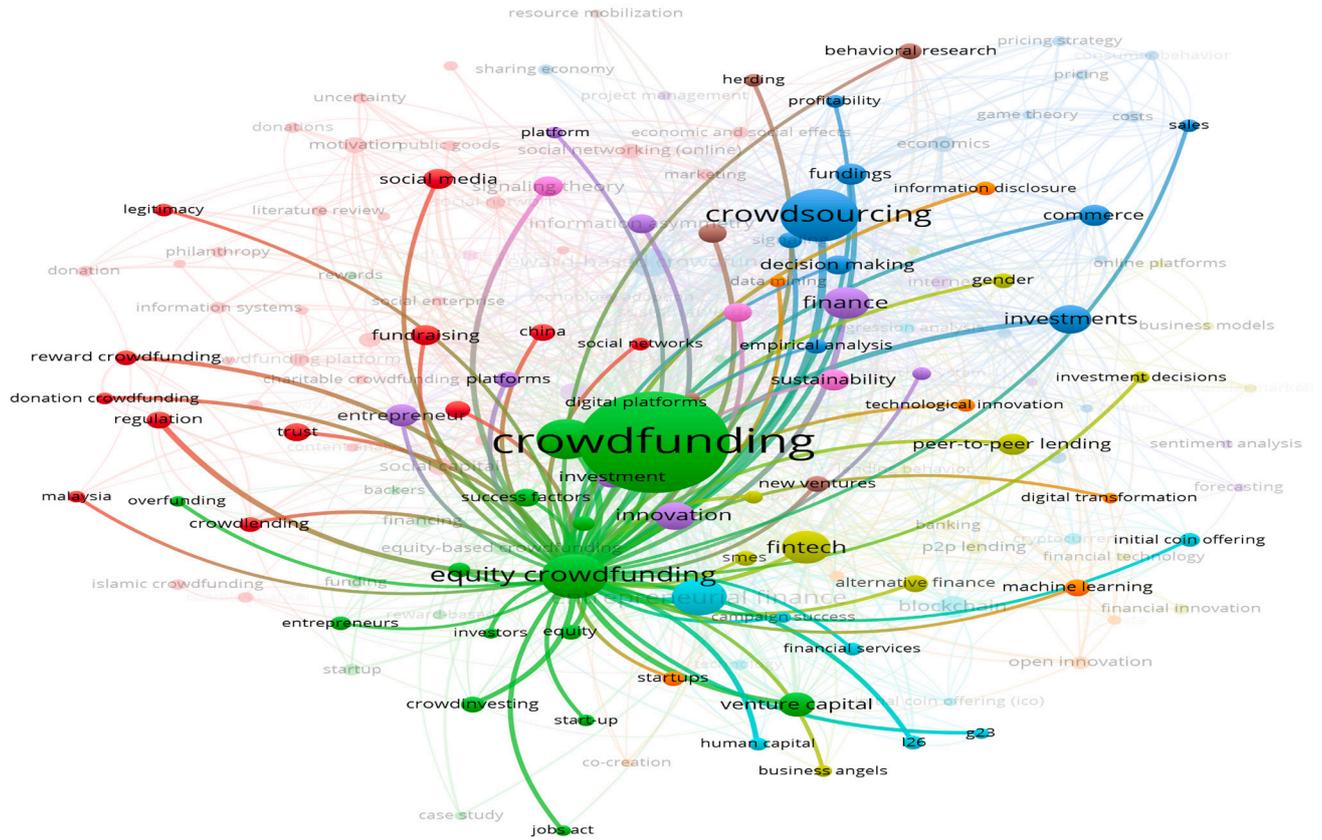
Source: Author's own.

In this last part of the paper, we will be taking a closer look at each of these most occurring keywords. This includes a visualization generated by VosViewer along with an overview of how each keyword appeared in both analyses, Keyword and Co-occurrence. We only looked at six of the top 15 keywords, which we thought were the most relevant to the core function of crowdfunding. These keywords are Crowdfunding, Equity Crowdfunding, Entrepreneurship, Sustainability, Investment, and finally Fintech. The detailed co-occurrence visualizations of specific terms, [Figure 22](#) to [Figure 27](#), reveal additional insights about the field's conceptual evolution. While traditional financial concepts like “equity crowdfunding”, [Figure 23](#), and “investment”, [Figure 26](#), maintain dense connection networks, a characteristic of established knowledge domains. While newer concepts like “sustainability”, [Figure 25](#), and “fintech”, [Figure 27](#), show emerging but less dense connection patterns indicative of evolving knowledge areas. Particularly notable is the “sustainability” co-occurrence network, [Figure 25](#), which shows connections to both traditional crowdfunding concepts and environmental terms. This hybrid connection pattern exemplifies what Kuhn described as conceptual bridge-building during paradigmatic transitions, the process by which new conceptual frameworks incorporate elements of established paradigms while introducing novel dimensions.

4.5.2. Crowdfunding

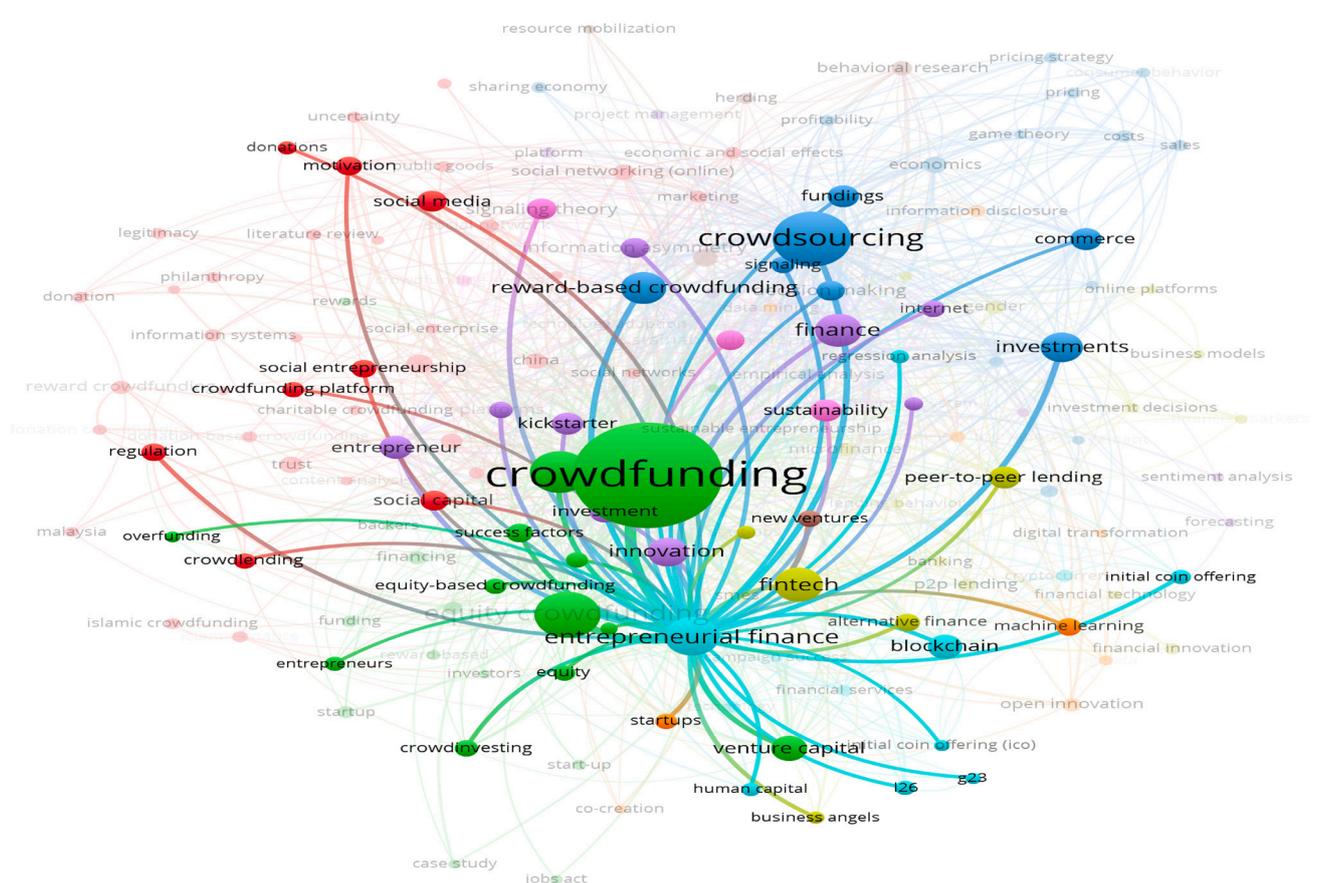
As per [Figure 22](#), we see the term Crowdfunding at the very center, with a very strong network of links connecting to the majority of keywords. It appears in cluster 2, occurring 1213 times, and forming 152 links. In our Keyword analysis, the strength of these links was measured at 3312 on the TLS scale. However, our Co-occurrence analysis measured the strength of these links at only 2347 on the TLS scale

Figure 23: Co-Occurrence Connections Map - Equity Crowdfunding



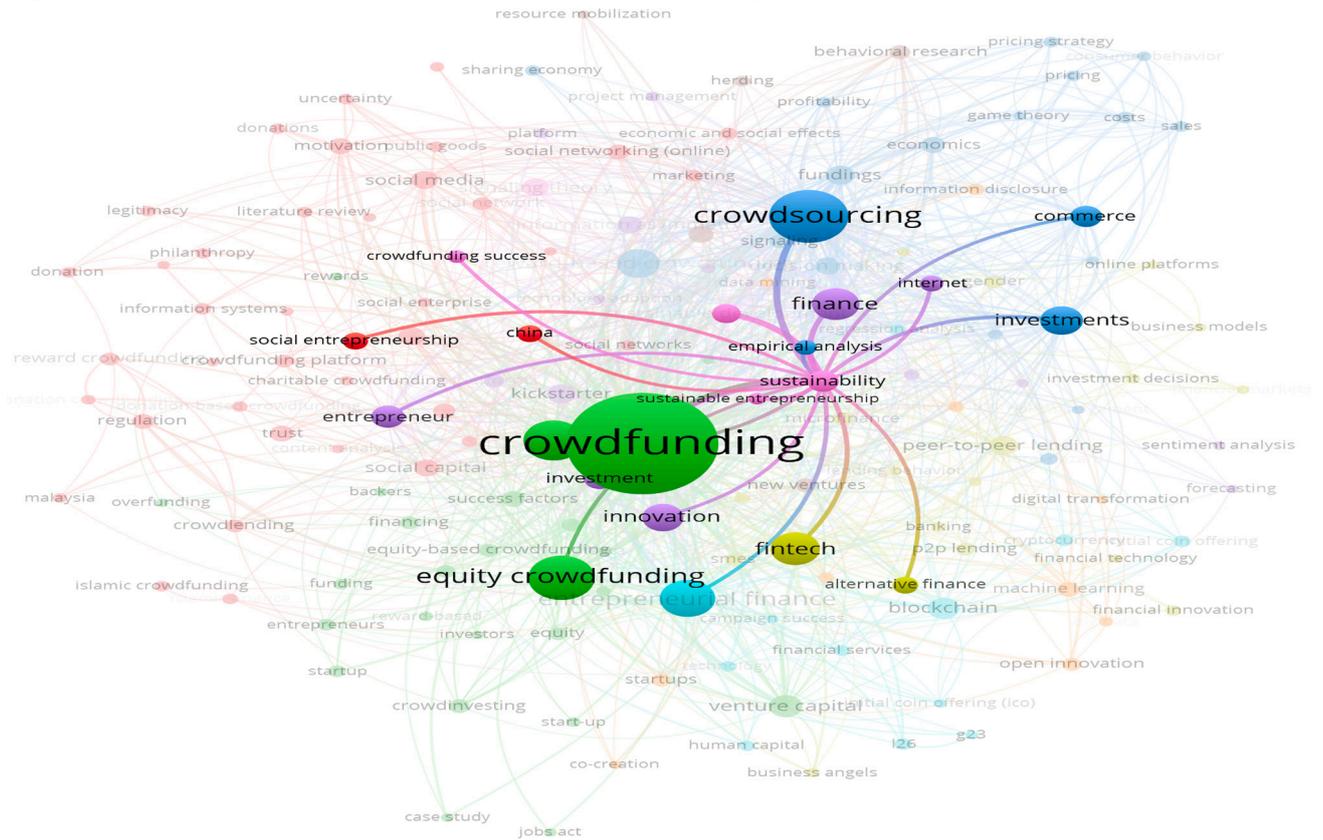
Source: Author's own.

Figure 24: Co-Occurrence Connections Map - Entrepreneurship



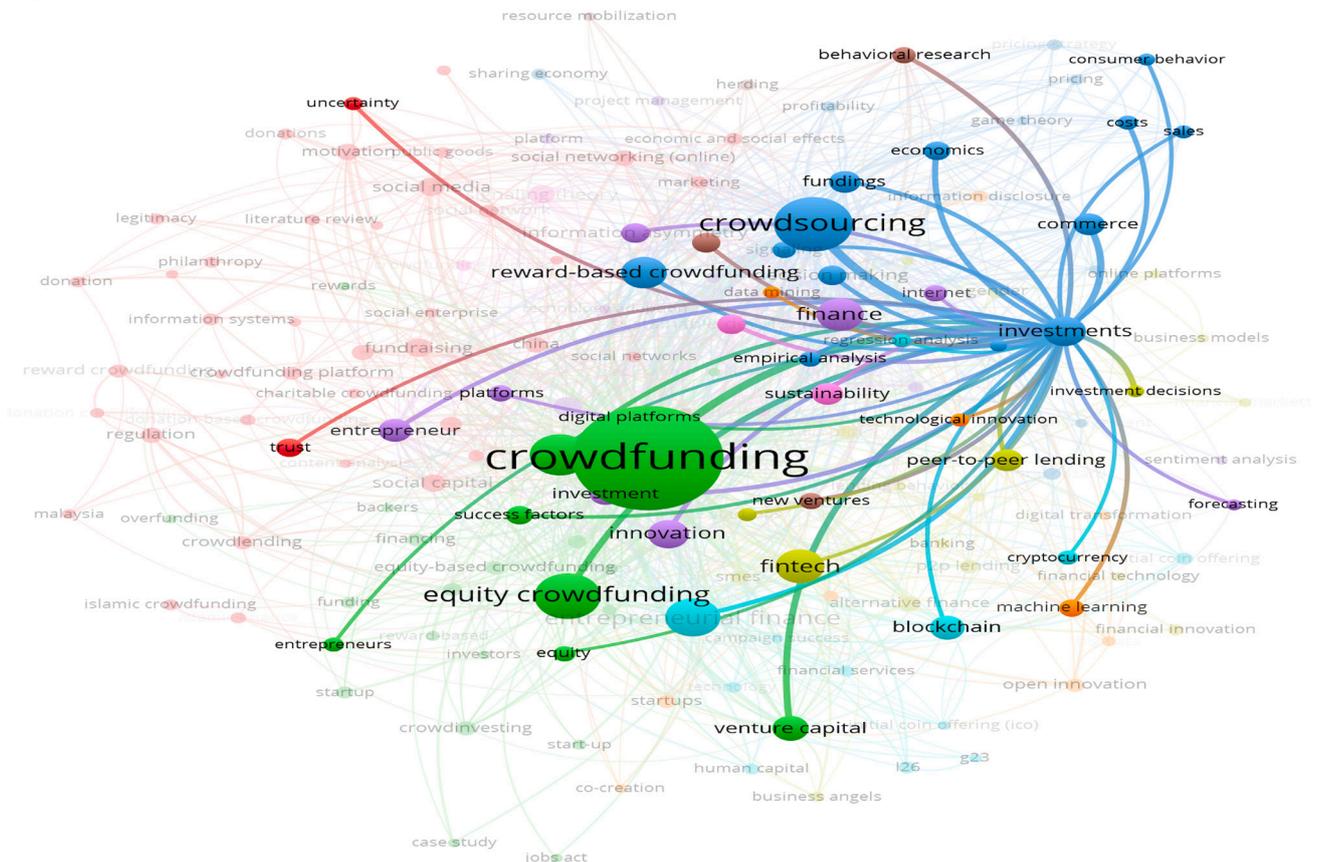
Source: Author's own.

Figure 25: Co-Occurrence Connections Map - Sustainability



Source: Author's own.

Figure 26: Co-Occurrence Connections Map - Investment



Source: Author's own.

was Troise with 14 articles, while the least published of all authors had 4 articles. Despite the United States appearing to lead the world in publishing on crowdfunding, after controlling for sustainability, China seems to take the lead and by a great margin as well.

We found that writing and publishing on crowdfunding has been, and continues to be, on the rise since it started in 2010. Despite the apparent decline in crowdfunding publications in the wake of COVID-19, our research showed that publishing on crowdfunding continued to increase in some areas of science, such as sustainability and the environment. This was indicative of a new direction the crowdfunding literature maybe following. However, 2024 provides evidence that publishing on crowdfunding in areas such as economics and finance is recovering and on a sharp increase, while that of sustainability and the environment began to decline. Perhaps the study can be repeated in a few years to verify if these patterns hold. We also found that the crowdfunding literature presents a strong unity of subject, as opposed to being fragmented and loose around the topic. This was the outcome of multiple analyses using network science, an area of research that is underused and underutilized as an analytical tool.

This study examined the apparent decline in crowdfunding research post-2020 through multiple bibliometric lenses, interpreted within the theoretical frameworks of paradigm shifts, citation life-cycles, and topic maturation. Our findings challenge simplistic interpretations of declining publication volumes as field obsolescence, instead revealing a complex pattern of knowledge evolution characterized by concept maturation, domain specialization, and paradigmatic transformation.

The bibliometric evidence supports three key conclusions:

- i. Crowdfunding research has evolved through distinct phases (emergence, consolidation, transformation) consistent with established models of scientific knowledge development. The post-2020 decline in publication volume represents a transition to the transformation phase rather than field obsolescence.
- ii. The field has undergone a significant conceptual shift from framing crowdfunding primarily as a financial mechanism toward conceptualizing it as a tool for sustainability and social impact. This paradigmatic evolution is evidenced by the divergent trajectory of sustainability-focused publications and shifting geographical leadership.
- iii. Increasing network fragmentation in co-authorship and bibliographic patterns reflects field maturation through specialization rather than dissolution. This fragmentation represents the natural evolution of a maturing field as researchers form specialized communities around specific applications and theoretical approaches.

These findings hold significant implications for researchers, journal editors, and research funding agencies navigating the crowdfunding knowledge landscape. Rather than signaling diminished relevance, our analysis suggests that crowdfunding research has entered a new developmental phase characterized by integration into broader frameworks and application to emerging challenges like sustainability. Future research should examine how crowdfunding concepts are being incorporated into adjacent fields like sustainable finance, impact investing, and digital platform economics. Additionally, deeper analysis of sustainability-focused crowdfunding research could reveal whether this represents merely an application domain or a fundamentally new paradigm for understanding crowdfunding phenomena.

Crowdfunding research appears not to be ending but transforming, evolving from a standalone financial innovation into an integrated component of broader sustainable and digital finance frameworks. This transformation represents not field decline but maturation, as crowdfunding concepts become incorporated into the fundamental knowledge structures of contemporary finance and entrepreneurship research. Our research showed that one of the reasons network science hasn't

been used sufficiently in research is that there are no clear guidelines and agreed-upon standards among scholars for defining and selecting keywords when publishing their works. Network science and many of its analytical applications can become more effective and can produce much more reliable results of higher quality if such standards exist. Therefore, it is our recommendation that an academic or a scientific body undertake the task of setting up guidelines and standards for researchers to follow when they define and select keywords for their published works.

Declarations

The author has no relevant financial or non-financial interests to disclose. The data are available upon a reasonable request from the author.

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