

What, where, who and how? A bibliometric study of crowdfunding research

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# What, Where, Who, and How? A Bibliometric Study of Crowdfunding Research

Vincenzo Buttice and Elisa Ughetto 

**Abstract**—In the first ten years of research on crowdfunding (CF), the growing interest in this topic among scholars has led to a rapid evolution of the scientific literature. Despite this interesting trend, no attempt has yet been made to provide a bibliographic analysis about how the subject has evolved over time and how the community working on this topic has changed. This article aims to investigate the status of and the trends in this literature by identifying, synthesizing, and evaluating the extant research on CF. Specifically, we focus on the characteristics of the authors and manuscripts written on the subject; the thematic areas investigated by scholars; the methodology employed in the existing studies; the main outlets for publication; and the level of dispersion of the scientific community involved in investigating CF. We also provide an analysis of backward and forward citations to provide an indication of the impact of CF research. Overall, this article shows that this body of research has undergone a significant transformation, moving from an early stage of identification and exploration to a more advanced phase characterized by a greater maturity, rigor and in-depth coverage of the examined topics. We also show a limited tendency for cross-country collaborations and an increasing impact of CF research over the years. This article may represent a guide for scholars interested in conducting research on CF, to identify highly debated research areas, and to select the most adequate methodologies and the right publication outlets.

**Index Terms**—Bibliometric analysis, crowdfunding (CF).

## I. INTRODUCTION

**C**ROWDFUNDING (henceforth CF) is an innovative way of financing that is changing the entrepreneurial finance ecosystem [27], [36]. It consists of the collection of small monetary contributions from the “crowd” by means of internet-based platforms, aimed at financing projects that would not otherwise have captured the attention of traditional financial investors [118]. CF has been reported in the academic literature as being more than a simple means of financing. It allows

entrepreneurs to develop a virtual community of followers [41], which provides a valuable source of information for testing and improving early versions of innovative products [53], [78]. Moreover, CF is a method that can be used to gain information about market response to a product [12] and the demand size [1]. It is also a powerful marketing instrument [35], [101] that can be used to increase brand awareness [229] or to enable open innovation [32], and it is an aid that can be used to promote arts and culture, social initiatives, and financial inclusion [138].

CF is emerging as a promising research area within the broader fields of entrepreneurship and management research. This funding means provides an interesting and novel setting in which to test existing theories and advance new ones. Moreover, because information on CF campaigns is available to the public, it offers plenty of easy-to-collect data that can be used to deepen the understanding of the financing of new ventures. The increasing number of studies on CF is also motivated by the enormous growth that this funding instrument has achieved in recent years. The industry grew from \$880 million in 2010 to over \$34 billion in 2015 [176] and has been forecasted to hit the \$93 billion mark by 2025 [264].

Scholarly interest in CF has resulted in a number of literature reviews on this topic [43], [82], [119], [146], [180]. However, the current efforts to map the extant research in this field have either focused on specific aspects of CF (e.g., equity CF, its effects on innovation, the success factors of a campaign, etc.) or provided general overviews of CF research without portraying either the knowledge structure or the evolution of the field. Therefore, the cumulative knowledge on CF lacks a clear mapping of prior research that provides an objective analysis not only of the results achieved so far, but also of the evolution of the research field.

After a decade of studies on CF, the aim of this article is to attempt to fill this gap. In doing so, our aim is to advance the field in two main respects. First, we aim at organizing the body of knowledge on CF. In particular, we analyze CF studies along the three macro-areas on which academic research has concentrated: CF Characteristics, CF Actors, and CF Campaign. We then further disaggregate them into nine finer-graded sub-thematic areas. CF is still a relatively new topic in the academic environment, with many aspects that still need to be investigated. The systematization of the extant research in the main research areas and subareas allows more defined boundaries of this field of study to be traced and helps to unveil promising avenues for future research, which are discussed in the conclusion of

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this article. Second, we carry out a bibliometric analysis to identify how the body of knowledge on CF has evolved in the last few years, the main publication outlets, the geographical concentration or dispersion of the scientific community, the density of research collaborations, and the methodological approaches and challenges that have to be faced when doing CF research. Compared to narrative literature reviews, the bibliometric approach allows structural overviews of a scientific field to be built, without any subjective bias and with quantitative rigor [240]. A bibliometric analysis complements the general overviews of a phenomenon in a formal and objective way, by mapping the research field in a systematic, transparent, and reproducible way [98]. It also helps to guide those scholars who are interested in conducting research in a specific field toward the most debated topics, and to select the most adequate methodologies and the right journals in which to publish. In this article, we follow the standard bibliometric approach that has been used in several studies across different disciplines to illustrate the state of the art of a field and its evolution (see, for example, [49], [81], [194], [208], [234], [235], [284], among others).

The analysis shows that the literature on CF has undergone a significant transformation, moving from an early stage of identification and exploration to a more advanced phase characterized by a greater maturity, rigor and in-depth coverage of the examined topics. Our work also illustrates a shift in the focus of CF scholars. Originally, the majority of works were committed to providing a broader view of CF and to tracing the boundaries of this phenomenon. These works mainly undertook a descriptive approach, based on qualitative methodologies. Over the years, these studies have been replaced by an increasing number of quantitative works that have focused on the CF campaign, the role of the involved actors and the fundamental impact social networks and the crowd have on the diffusion and the success of funded projects. Our review shows that CF has attracted the interest of scholars from a multitude of different fields, who have applied their theories and methodologies to this novel setting. Nowadays, CF is studied by economists and business management researchers alike, but also by a number of computer scientists, psychologists, and sociologists. A limited tendency for cross-country collaborations has also been revealed in the bibliometric analyses, together with the fact that the majority of studies on CF are conducted by US- and China-based scholars, which are also the countries where CF markets are more developed [79].

We believe that this article may be used as a guide for scholars interested in doing research in CF in order to identify highly debated research areas, and to select the most adequate methodologies and the right journals in which to publish. It may also be an easy way to access sources for practitioners interested in gaining a deeper understanding of CF research.

The rest of the article is organized as follows. A complete description of the methodology is discussed in Section II to identify and classify the reviewed articles. We discuss CF research along the identified thematic areas and research lines in Section III. We present the bibliometric analysis in Section IV. Finally, Section V concludes this article.

## II. METHODOLOGY

In this section, we describe the inclusion criteria and the search strategy we followed to select and classify the articles included in our literature review on CF. We used the Scopus database to retrieve the selected articles. Scopus is widely recognized as a tool that implements a rigorous methodology to catalog articles and which has been widely used in other bibliometric literature reviews (see [49], [102], [235] among others).<sup>1</sup>

We reviewed articles published in the time span between 2010 and 2019 and we selected papers between 2010 and 2018 for inclusion in the bibliometric analysis. We set 2010 as the beginning point of time because it was in this year that the first influential article on CF was published. We decided to include papers published till 2018 in the bibliometric analysis to ensure enough time to obtain a sufficient number of forward citations.

We used “crowdfunding” and “crowd-funding” as keywords in the search tool.<sup>2</sup> The first query extraction returned 1162 articles. Starting from this set of articles, the following step was to select the works that had only been published in academic journals. We excluded books, book chapters, conference proceedings, and unpublished works, which may contain less validated knowledge, although they could provide significant contributions to the field (note that [235] also followed this procedure). This step allowed us to decrease the number of considered articles to 633.

We subsequently refined the search by performing a query on both the title and abstracts of the papers that had to contain the words “Crowd” and/or “Funding” and/or “Platform.” This additional refinement reduced the number of papers to 605. We then excluded articles that did not provide any abstract, and this led to a further reduction to 573 papers. After carefully reading all the abstracts, we dropped those articles that just mentioned CF as a financing method, while the main focus was on describing the project or the results of the project, articles that talked about different ways of financing and which mentioned, among the others, CF and articles that had Crowdsourcing as the main topic. After this “cleaning,” we were left with a total of 213 articles.

We collected all the available information for each article, including backward (references) and forward citations, the authors and affiliations, the publication data and the Scopus category. We recorded the following information for each paper: the author(s); title; year of publication; journal; country; methodology; type of study (i.e., literature review, quantitative or qualitative analysis);

<sup>1</sup>The choice to just search for articles in Scopus was motivated by the need to rely on one consistent source of information for our bibliometric analysis. This facilitated the comparison of articles reported in different databases (e.g. Google Scholar) and prevented the need to harmonize data. It should be noted that prior literature which explored the coverage overlap between Scopus and WoS ([99]; Vera-Baceta et al., 2019) revealed that Scopus also covers the titles indexed in WoS. Gavel and Iselid [99], on the basis of 2006 data, showed that, at that time, 84% of the active titles in WoS were also indexed in Scopus. The recent study by Vera-Baceta et al. (2019), in which 6,071,821 documents indexed in WoS and Scopus during 2018 are analyzed, has found that Scopus has a greater number of indexed documents in all research areas except Arts & Humanities.

<sup>2</sup>The query of the first extraction was: [TITLE-ABS KEY (crowdfunding) AND TITLE-ABS-KEY (crowd-funding)].

he key findings. After a careful reading of all the articles, we systematically organized their content into three thematic areas (CF Characteristics, CF Actors, and CF Campaign) and nine subthematic areas (Forms of CF; Purpose and Usage; Impact on entrepreneurship; Risks and Regulation; Backers and Fundraisers' motivation; Types of Actors; Campaign Launch Process; Success Determinants; Social Dynamics). Following prior research [203], [235], [237], we derived the thematic and subthematic areas from the data, through an inductive approach. We coded the articles independently, and any discrepancy that arose when classifying the articles into the considered areas and subareas was discussed until agreement was reached. Each paper was included in only one category in order to avoid double-counting.

### III. RESEARCH ON CF

In this section, we synthesize the content of the articles selected for the review, with the aim of organizing the body of knowledge on CF in the thematic areas and sub-thematic areas highlighted in the previous section. In particular, we classify the results of prior literature into three major categories (CF Characteristics, CF Actors and CF Campaign) and into nine finer graded subthematic areas.

#### A. CF Characteristics

The literature that explored CF characteristics initially provided an overview of the phenomenon. This literature has contributed to a number of definitions of CF [2], [18], [19], [112], [148], [182], [239]. Moreover, it has discussed CF from the crowdsourcing perspective [55] and has underlined its function in democratizing innovation [184]. We envisaged the following four different subthematic areas:

- 1) forms of CF;
- 2) purpose and usage;
- 3) impact on entrepreneurship;
- 4) risks and regulations.

1) *Forms of CF*: A significant number of early articles on CF focused on defining the boundaries of this emerging funding source. The very first works of this article strand undertook a descriptive approach, with the aim of illustrating and comparing the different forms of CF: Donation-based CF, Reward-based CF, Lending-based CF, and Equity-based CF. These studies stressed that all forms of CF use the same channel to reach the crowd (i.e., the internet platform), but display different working principles. Studies related to this subcategory [118] have looked at the average CF amount collected through different CF forms, showing that, on average, equity and lending-based CF are associated with larger fundraisings, while the capital collected through donation-based CF is typically below a few thousand dollars [18]. This literature has also stressed that different CF forms are associated with different levels of riskiness and complexity [118] for fundraisers and backers alike. Indeed, compared to donation-based CF, a fundraiser who is willing to launch an equity-based CF campaign, generally has to deal with a complex scheme of controls [153], which require an extensive set of documents and

information to be produced and made public [170]. Similarly, across countries, the legal requirements for backers willing to invest in a CF campaign are generally more compelling in the case of equity-based CF than for the other CF forms [118]. The regulatory complexity of equity-based CF has attracted increasing scholarly attention. Over the years, a number of studies have described the transformation of equity-based CF into different business models, among which the nominee structure and direct ownership are currently the most diffused and accepted [265]. In nominee equity CF, the CF platform administers the shares as the legal representative of the crowd's interests [253]. For entrepreneurs, this means that they can still reach out to their investors for advice, networking and mentoring, but only need to report to and receive consent from one counterpart, not their entire investor base [67]. On the other hand, the platform in direct ownership equity CF does not act as an intermediary, and the company has to report to each crowd investor [265]. Equity CF is highly regulated, due to its risk profile and the typical liabilities of other seed financing activities, such as business angels and venture capital (VC) financing [151].

The different modes of CF have important implications for both backers and founders. The type of remuneration drives the backers' choices, but founders also have to consider what model to adopt for their campaign. Meyskens and Bird [179] proposed an interesting framework that suggests what model to use according to the type of value generated by social ventures (i.e., economic and social). The lower the economic value generated, the higher the benefit founders can be obtained from using a noncommercial model. A recent paper by Cumming *et al.* [66] has shown that, in the context of equity CF, a higher separation between ownership and control rights lowers the likelihood of attracting professional investors, hence highlighting that CF can influence the attraction of follow-on investments.

2) *Purpose and Usage*: The initial work on CF discussed the origins of the phenomenon and why this new way of financing had emerged. Authors linked the rise in CF to the increasing popularity of Web 2.0, crowdsourcing and the concurrent burst of the financial crisis [2]. The financial crisis, indeed, led banks to be reluctant to lend to SMEs (especially the riskier ones) and triggered the market to look for a new gateway to financing. The phenomenon then became stronger, thanks to the Internet. CF started to be used for social entrepreneurship initiatives [21], although it is still relatively unknown in this field (see [153]). Özdemir *et al.* suggested that one of the purposes of CF is philanthropism. Another reason why CF is largely exploited is that it can be used to test an idea and can act as a marketing tool to promote new products or simply the company itself. Sheldon and Kupp [221] suggested a six-part market testing method based on CF. The backers, most of the time, are involved in the project in many ways [96], they are part of the success of the campaign and they feel part of the project itself [41]. For this reason, thanks to the platforms and social networks, the relationship between companies and customers is strengthened with CF.

CF initiatives differ in terms of their profit or nonprofit purposes. Although the main sector financed by CF is the

technological one [230], there are alternative fields in which CF is used. It is, for example, a way academics use to finance their research. Marshall [174] presented some examples and tips regarding “kickstarting” scientific research. Sauerman *et al.* [218] extended the knowledge on crowdfunding for scientific research by investigating the determinants of the success of scientific projects. Wheat *et al.* [263], who compared CF with traditional funding sources for scientific research, provided a similar contribution. The specialized literature has reported that journalism has experienced a “new renaissance,” in part, thanks to CF. In fact, the possibility of freelance journalists financing their own works through the crowd offers them the opportunity to feel free to write [48], as they are completely detached from the influences of institutional and economic powers. The same is happening in the music sector: artists can fund their new albums, thanks to the support of their fans, thereby enabling them to be freer and more independent [97]. CF could also be used for civic purposes, to provide services to communities [73], [133], [232]. Civic CF can strengthen the relationship between the public and institutions and governments, helping communities to become more involved in the public sphere [73]. Another usage of CF is real-estate financing. People can contribute, with relatively small contributions, to build or simply to manage buildings, resorts or hotels, and obtain a return from renting or selling real estate. CF has frequently been used to improve environmental and social quality [20], [42], [45], [65], [124], [246], [251]. CF has also been employed to fund personal projects, such as marriages, graduation gifts, journeys, etc. In addition, several studies have analyzed the important contribution of CF when placed side by side with VC financing. The importance of cooperation between these two forms of financing emerges, especially in the postcampaign phase. In fact, VCs, apart from economically supporting a venture, also exert a coaching function after its launching. For this reason, it could be helpful for these two sources of financing to act as complements rather than substitutes in the seed phase [70], [135]. A strong point in favor of complementarity is that the crowd knows the local demand and the local market better than VCs [162]. In fact, as shown by Sorenson *et al.* [227], CF attracts VC funds in regions that have normally been excluded from VC financing.

3) *Impact on Entrepreneurship:* The literature has pointed out a number of disruptive effects that CF can generate on entrepreneurship. One major impact is on the way entrepreneurs bring a product to market. They consult the market during the development of the product until its commercialization. This new approach is associated with two intrinsic characteristics of CF: openness of the market (i.e., the organizations can take ideas from inside or outside the organization itself) and the role of backers as predictors of market performance [230]. A few studies have also focused on the performance of crowdfunded firms following the campaign. One major contribution pertains to research on fraud in CF [64], [182]. This article reports that only about one product out of three still have to deliver two years after the end of the campaign [182]. Overall, these results suggest that entrepreneurs often face significant challenges in designing and manufacturing their products. The study by Buttice and Noonan [44] shows that these challenges are inherently linked to the

characteristics of the CF model, i.e., the attraction of a large crowd of investors. The authors argued that entrepreneurs in CF can develop a feeling of mutual social obligation toward backers that may lead them to undertake suboptimal decisions that hamper product delivery. Gleasure and Feller [108] used a different approach and focused on the impact that different forms of CF can generate on the whole entrepreneurial finance ecosystem. For example, they suggested how Lending-based CF puts pressure on financial institutions. Equity-based CF creates a new way of financing SMEs. Donation-based CF instead raises the likelihood of a project, which does not promise any remuneration, of being funded. This happens because platforms enlarge the accessibility to communities of donors. The same happens for the Reward-based CF. Another significant impact of CF is that it supports fast-expanding markets, because it enables shared values to be created [16]. These markets are the ones that show a high rate of growth during the first years. However, the current literature on CF, because of the lack of a sufficient time span after the CF campaign, has so far understudied the impact of CF on entrepreneurship. As we will discuss in the following sections, this is an interesting area of investigation for scholars interested in contributing to the academic debate on CF.

4) *Risks and Regulation:* The characteristics of CF entail a number of risks, which have been widely discussed in the prior literature. Stack *et al.* [228] identified three types of risks that can affect CF: fraud and money laundering (i.e., the project is a fake and is only aimed at gathering money from well-intentioned investors), intellectual property theft (i.e., investors could be interested in stealing ideas more than in investing in the good ones), and “failure by success” (i.e., failure due to an overfunding of the project when such an overfunding causes delays in delivering the final product). The risk of fraud can affect the entire CF system and its credibility to a great extent, because it directly affects the real engine of CF: the crowd. To reduce this risk, scholars have noted that fraudulent behavior can be detected when analyzing the language and the content used to describe and promote the project. Indeed, mixing static and dynamic communication analysis can help to identify frauds [222]. Finally, there are some CF forms that reduce the risk of fraudulent behavior. For example, “all-or-nothing” campaigns (i.e., CF campaigns wherein the fundraiser is allowed to withdraw the money only if the funding collection is higher than a target goal fixed ex-ante) can prevent this attitude, because the founders can only obtain funds if they have met the target goal [239].

To reduce such risks, a growing normative interest has developed around CF. Research on how CF is regulated, in its different forms, is a matter of recent academic interest. Equity CF is the form that has the strongest impact on regulations all over the world. Regulations have recently been introduced in most nations. de La Viña and Black [75] highlighted the various positive effects of regulating equity CF in the US: increasing the rate of business start-ups, encompassing a wider range of potential projects and founding goals, slowing the small business failure rate, creating more jobs, increasing business funding outside the major urban areas or innovation hubs, and

offering nonfinancial benefits. In general, regulating equity CF makes the investment process more flexible and accessible and at the same time protects the investors by imposing duties and responsibility on the platforms [269]. Cumming and Johan [68] highlighted that founders prefer less strict regulations with lower disclosure duties and flexibility in order to raise the most capital. Platforms prefer less disclosure and less stringent rules and, finally, investors are in favor of the strictest possible control and regulatory rigidity in order to feel protected. The USA (through the JOBS Act, Title III), the UK, and Italy are the first countries that have introduced juridical forms of regulations in this field. These regulations fix a number of quantitative limits on the investment. Issuers must conform to disclosure rules, and investors have different investment limits in relation to their annual income or net worth. Platforms have also started to be regulated. In the US, for instance, platforms that want to be eligible for exemption from registration as brokers have to be registered in a national security association (i.e., Financial Intermediary Regulatory Authority) under the Exchange Act.

## B. Actors

The actors are a fundamental component of the entire CF process. The literature has outlined the roles that different players have in the CF environment and the motivations that push them toward becoming involved in this new way of financing.

1) *Types of Actors*: Three types of actors can be envisaged in CF: fundraisers, backers, and platforms. Fundraisers give rise to CF campaigns [43] and may be classified as profit or nonprofit, with the latter promoting humanitarian initiatives or initiatives that have a social or environmental impact. The literature has outlined that different types of fundraisers rely on CF. Early studies on CF showed that fundraisers mainly relied on this funding source to overcome a funding gap [32]. CF is in fact considered, by fundraisers, as an easy, safe, and well-organized way of raising money and thus it is extremely valuable for those who find it difficult to obtain funds from banks, venture capitalists, or business angels [101], [139], [182]. Prior evidence has shown, for instance, that an increasing number of female entrepreneurs turn to CF as a source of finance for their entrepreneurial activities [111], [132]. Similarly, a number of empirical and theoretical studies have shown that fundraisers rely on CF when they operate in industries that are typically underfinanced by other entrepreneurial finance investors, such as the clean-tech industry [45], [153] or cultural and creative industries [133]. Over the years, research has focused on investigating the characteristics of fundraisers that rely on CF and how the differences in fundraisers can explain the success of a CF campaign. Scholars, with reference to the first research stream, have focused on comparing the start-ups that rely on CF. The commonly accepted view is that CF is considered as the last resort by fundraisers [26], [254]. However, the production on this research strand remains limited, and has only focused on equity CF, thus calling for further investigation. On the contrary, an abundant amount of scientific production has focused on how the characteristics of fundraisers are associated with the success

of CF. In this respect, scholars have shown that certain personality traits, such as openness and agreeableness, are positively correlated with CF success [236], while narcissism is negatively correlated with success [28]. Other studies have looked at the social networks of fundraisers to prove that the more central ones are associated with a higher success rate [249], [250], while others have shown that human capital is positively correlated with the success of CF [3].

A second important actor in CF is backers, who are the supporters of the projects and enable them to be funded. Backers not only represent an important source of funding, but also provide additional benefits for fundraisers. They are in fact a source of information, about both the product potential demand [12], thus providing entrepreneurs with a market analysis at a low cost, and about the product itself, thus becoming product cocreators [267]. In some particular cases, they also play a key role in helping a breakthrough come to life. In fact, as shown in some studies, the crowd invests in projects that would otherwise remain unfunded and in this way enable new innovative start-ups to be created. By comparing the investment decision of professional investors and CF backers, it has been highlighted that backers are often very attentive judges [183]. Research has shown that a non-negligible share of backers is generally composed of fundraisers' families and friends [2] and of people who are geographically proximate to the fundraiser [178]. Moreover, backers' decisions to support a CF campaign are often guided by social proximity or homophily. Evidence in support of this view has suggested that fundraising may be easier when fundraisers and crowdfunders have the same occupation and/or educational background [131].

Finally, CF platforms are infrastructures that are somewhat intermediate between founders and backers, which enable communities and networks of people that have the same interests in a specific field to be created [83]. Platforms have received comparatively less scholarly attention, with a limited number of studies having been published in the period under consideration.

2) *Backers and Fundraisers' Motivation*: The motivation behind launching and/or investing in a CF campaign is another topic that was addressed in the prior literature. Fundraisers have generally been reported to enter the CF market to satisfy personal needs that are still unresolved [32] or to promote social projects [69]. On the contrary, the drivers that push backers to invest can be variegated. Being able to anticipate the backers' motivations is at the basis of planning a successful campaign. When creators have to launch a campaign, they need to consider the motivations that push potential backers to invest in the project. Since each project addresses different sections of the crowd, it is essential to know which one to intercept. Mohammadi and Shafi [181] found that female investors are more risk averse and hence invest in CF campaigns driven by cautious behavior. According to Ryu and Kim [215], backers are essentially motivated by three factors that determine their behavior: the sponsor's personality, the demographic factors of the sponsor, and the characteristics of the project. These aspects lead to two different categories of motivation: intrinsic versus extrinsic [10] and self-oriented versus other-oriented. The backers' motivations can range from

philanthropy to economic reward, sense of community, social recognition and formalization of contracts [43], [215]. Backers motivated by philanthropic purposes are willing to support causes that deal with social themes and that generate a positive effect on the community. On the contrary, backers that are looking for an economic return are typically self-oriented and support reward-based and equity-based CF projects. Other backers support projects in which they feel involved, because they want to be part of a community [41]. Others may desire social recognition (e.g., being recognized as the first investor that believed in the potential of an innovative idea). Ryu and Kim [215] classified backers into four categories: angelic backer (i.e., with a high degree of philanthropic motivation), reward hunter (i.e., driven by economic reward motivation), avid fun (i.e., active attitude, driven by both reward and philanthropic motivations), and tasteful hermit (i.e., shy figure with disagreeable traits, moved by less extrinsic and other-oriented motivations).

### C. CF Campaign

The campaign is among the most crucial factors in determining the success of a project, because it is the communication channel that allows the backers to get in touch with the fundraiser and the project. The literature has investigated the various elements that constitute the campaign, as well as what determines the success of a CF campaign and the social dynamics that influence the players involved in such a campaign (backers and founders). Both social networks and psychological aspects have been found to have an impact on the way founders decide to base their campaign and on the approach the projects backers follow. Recent works have started to look at the postcampaign and the consequences that CF has on the subsequent performance of a funded company. Stanko and Henard [229] found that the amount of money raised through a reward-based CF campaign is not relevant for the future success of a product, and that the number of backers is the main determinant. Roma *et al.* [212] focused on the attraction of professional investors after a reward-based CF campaign. They showed that collecting larger amounts of funding is important to attract a higher number of professional investors after the company is constituted. However, this association is conditional to the presence of patents and a consistent amount of social capital.

1) *Campaign Launching Process*: Several factors can influence the setting up of a CF campaign. Tomczak and Brem [239] developed a flowchart of this process that may be broken down into five phases: the first one is the choice of the type of CF by the founder, which may be direct (i.e., owning a platform or a webpage) or indirect (using a platform that is not owned). The second one is the choice of the funding model, which may be ex-post (i.e., offering the product once the financing has been completed) or ex-ante (i.e., starting the campaign and the financing when a project is still work-in-progress). The third one is the selection of the reward mode, and refers to the different ways creators are funded (e.g., “all-or-nothing” mode, “all-and-more” mode, “holding” mode, or “club membership” mode). Another phase of this process is the choice of the type of investment (i.e., active,

passive, or donation). The last phase concerns the determination of returns, in the case there is a partition of securities among the players or other forms of shared returns. Among the main elements that can influence the development of a campaign, the importance of choosing the right platform, which is affected by the type of CF (i.e., direct or indirect), the type of project, the output (e.g., a new product or a service) and its nature (profit or non-profit), has been highlighted.

Another issue is related to setting a target goal and a time limit, which are influenced to a great extent by the reward mode and the type of investment. Contributions tend to increase if the collected funds are close to the funding goal; instead, they tend to decrease if the goal is already reached. Furthermore, if the campaign is close to its deadline, the contribution increases [145]. Developing and launching the campaign (e.g., a video, updates of the project, interactions with the network through social media, company logo) implies considering what information the founders ensure for the crowd and the rewards they choose for it [168].

2) *Success Determinants*: The literature has largely investigated the main success determinants of CF campaigns. An attractive business model, an appropriate preparation of the precampaign (including how the project is written) and advertising activities have been found to positively affect the chances of success of a CF campaign [7], [225]. The study conducted by Hu *et al.* [128] dealt with pricing decisions when a CF campaign is launched in an “all-or-nothing” mode and the output is a new product. The authors found that, when the potential backers are heterogeneous, the founders should offer different product lines with different quality levels to optimize the backers’ base and increase the success rate of the campaign. The minimum investment level is another factor that has been examined. In fact, the larger the minimum investment required is, the smaller the attraction of potential backers [166]. Social capital (both external and internal) is generally considered as a base of success of a CF campaign. As highlighted by Lehner and Nicholls [152], social capital interacts with other types of capital, thereby contributing to increase the likelihood of the success of a campaign. For example, external social capital can contribute to the success of a campaign when combined with FFF (Fools, Family, and Friends) capital [2], [182]. The internal social capital, seen as the support of other community members of a project, can help to raise funds in the very first days of the campaign [59].

The location of the founders can be a key determinant for the success of a project, especially when a project yields an impact on a territory. However, its importance decreases for projects that have other purposes (e.g., a project related to the financing of a creative product, such as a music album). In this respect, Agrawal *et al.* [2] highlighted that distance does not play a key role in the art sector.

Other factors that can affect the success of a campaign are: the number of backers, the target amount, and the duration of the campaign. There is no univocal consensus on whether attracting a larger number of backers helps to determine the success of a campaign. In some cases, a high number of backers introduces noisier signals that are bad for the campaign [77].

TABLE I  
DISTRIBUTION (N AND %) OF THE ARTICLES ACCORDING TO THE THEMATIC AND SUB-THEMATIC AREAS

Thematic areas	Sub-thematic areas	N. Articles	Relative %	Total %
CF Characteristics	Forms of CF	29	25%	14%
	Impact on entrepreneurship	31	27%	15%
	Purpose and Usage	49	42%	23%
	Risks and Regulation	7	6%	3%
	<b>Total</b>	<b>116</b>	<b>100%</b>	<b>54%</b>
CF Campaign	Campaign Launch Process	10	14%	5%
	Success Determinants	37	53%	17%
	Social Dynamics	23	33%	11%
	<b>Total</b>	<b>70</b>	<b>100%</b>	<b>33%</b>
CF Actors	Backers and Fundraisers' motivation	15	56%	7%
	Types of actors	12	44%	6%
	<b>Total</b>	<b>27</b>	<b>100%</b>	<b>13%</b>
<b>Total</b>	<b>Total</b>	<b>213</b>	<b>100%</b>	<b>100%</b>

TABLE II  
YEAR OF FIRST ARTICLE PUBLICATION ACCORDING TO THE THEMATIC AND SUBTHEMATIC AREAS

Thematic areas	Sub-thematic areas	Year of first publication
CF Characteristics	Forms of CF	2012
	Impact on entrepreneurship	2010
	Purpose and Usage	2011
	Risks and Regulation	2013
CF Campaign	Campaign Launch Process	2013
	Success Determinants	2013
	Social Dynamics	2014
CF Actors	Backers and Fundraisers' motivation	2013
	Types of actors	2015

TABLE III  
DISTRIBUTION OF THE ARTICLES ON CF ACCORDING TO THE DOCUMENT TYPOLOGY (AS CLASSIFIED IN SCOPUS) AND THEMATIC AREA

Type of study	CF Characteristics	CF Campaign	CF Actors	Total
<b>Quantitative</b>	40 (34%)	60 (86%)	20 (74%)	120 (56%)
<b>Qualitative</b>	21 (18%)	8 (11%)	4 (15%)	33 (16%)
<b>Theoretical</b>	50 (43%)	2 (3%)	3 (11%)	55 (26%)
<b>Literature Review</b>	5 (4%)	0 (0%)	0 (0%)	5 (2%)
<b>Total</b>	<b>116</b>	<b>70</b>	<b>27</b>	<b>213</b>

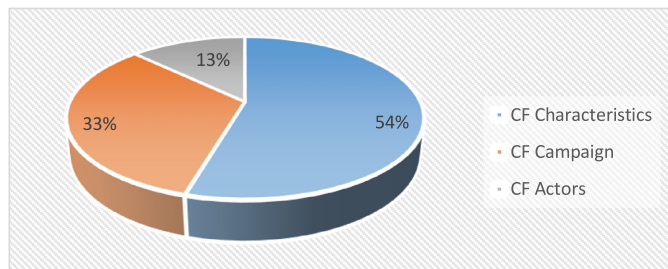


Fig. 1. Percentage distribution of the articles according to the thematic area.

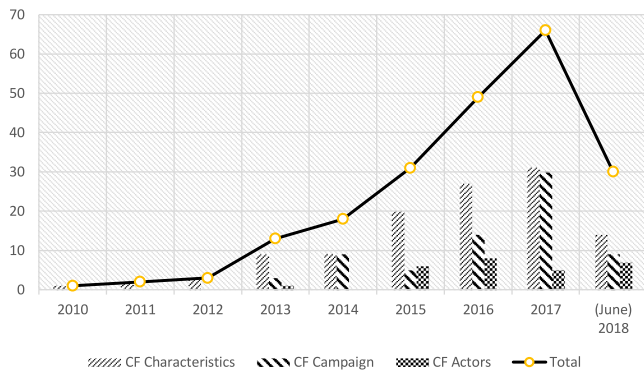


Fig. 2. Distribution of publications over the years (2010–2018) for each thematic area.

Moreover, the willingness of investors to invest is amplified if they feel involved in the project. Backers that feel more involved in a project care more about the project results [58]. This is why anchor values play an important role regarding the emotional involvement of backers: values that unify communities of founders (and backers) help in the success of campaigns by anchoring them to specific projects [106]. However, there is also evidence that supports the view that attracting a large number of backers is positively associated with the success of a campaign. This is particularly true when the fundraiser is able to attract a sufficiently large number of backers in the first few days of the campaign [59], [201].

The literature has shown that the target amount may be positively correlated with the number of backers [166], but Zheng *et al.* [279] and Mollick [182] did not confirm this result when looking at the success of the campaign. These authors

TABLE IV  
STUDIES' LEVEL OF ANALYSIS ACCORDING ACROSS CF FORMS

	Campaign	Country	Firm	Investor	Platform
<b>multiple forms</b>	2	3	-	2	2
<b>donation</b>	2	1	-	2	-
<b>equity</b>	11	7	4	4	2
<b>lending</b>	5	-	1	2	1
<b>reward</b>	41	3	7	9	3

instead highlighted a negative correlation between the target amount and the success of a reward-based CF campaign. The results about the duration of the campaign are also mixed. Some studies found that a shorter duration of the CF campaign helps the success of a project [77], while others reported that a short duration is negatively associated with success [278].

Other factors that may influence the success of a campaign are related to emotional aspects that affect backers. Chen *et al.* [54] found that guilt appeals (i.e., the responsibility of contributing that backers may feel in some particular cases) affect the success of donation-based CF. Utilitarian type products (i.e., those that have practical, functional, and instrumental benefits) affect the success of a campaign more than hedonic ones. However, whenever emotional message frames highlight the hedonic component of the product more, their effectiveness increases. Finally, a small number of reward levels have been found to be more appreciated by potential backers and helpful in achieving good results during a campaign. Other studies focused on the correlation between campaign success and a reward menu or information disclosure. Zhou *et al.* [282] found that the description of a project is a key determinant of the success of a CF campaign. Younkin and Kashkooli [270] identified four main problems that may affect the success of a campaign and the promotion and commercialization of a new product: coordination (i.e., founders

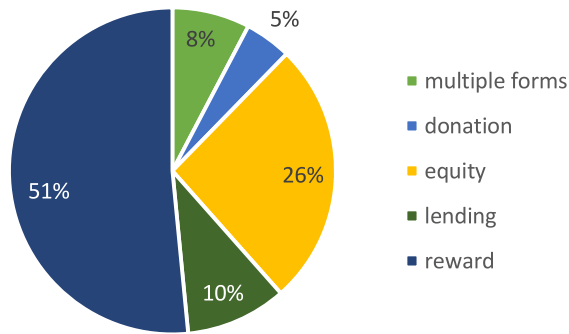


Fig. 3. CF research by CF forms.

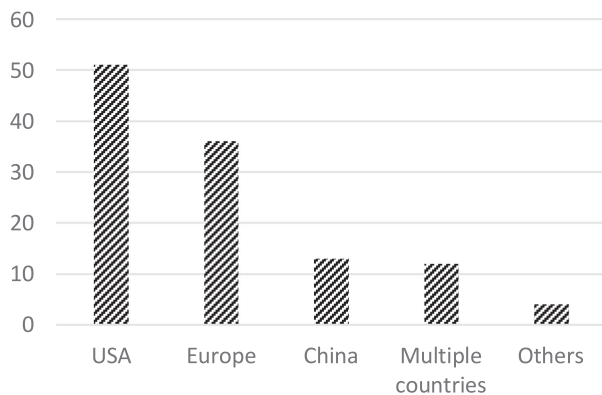


Fig. 4. Sample used in CF empirical research.

need to get in touch with the right customers), gatekeeping (i.e., access to a pool of capital that is not normally accessible), patronage (i.e., contributions from donors with normally nonfinancial purposes), and inexperience (e.g., first-time founders). However, CF platforms partially solve these problems.

3) *Social Dynamics*: Knowing exactly how to act with the crowd is also a meaningful determinant of the success of a CF campaign. Internet provides an environment where social interactions can proliferate, and where people take into account the choices of others in their decisions [236]. There are essentially two types of online social interactions, as identified in the extant studies: opinion-based and behavior-based social interactions. The opinion-based form is also known as eWOM (Electronic Word-of-mouth) communication. This social interaction is generated by a cascade of opinions expressed by consumers that spread throughout the crowd. The other form is related to the practical behavior of other consumers (e.g., people induced to download a song because it has already been downloaded by a large number of people). The importance of social interactions is essentially linked to the herding effect they can generate. The consequences of amplifying the outcomes induced by social interactions can be positive or negative. Information asymmetries can alter market mechanisms and lead to market failures. The founder can send positive signals to the potential clients in order to reduce information asymmetries and to direct the crowd. Courtney *et al.* [60] demonstrated that signals from start-ups and third-party endorsement can mitigate information asymmetries and contribute to the success of a CF campaign. The use of social

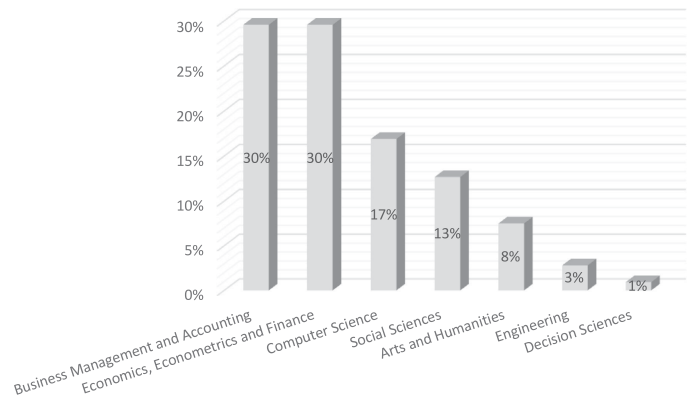


Fig. 5. Subject areas (as defined in Scopus) of the journals that publish work on CF research.

networks enables founders to enlarge the network of people they can ask for support. Social networks can contribute to the spread of information about the project and the way the creators do this can influence backers in different ways. Kromidha and Robson [141] examined whether the founders and backers that identify themselves with a project constitute a help for the success of a campaign. They found that if people feel they are part of a group, they act as the group acts, according to the social identity theory. On the other hand, social networks can contribute to the spread of fake information. A few works have studied how using social networks to promote fake information can help founders to collect more money for their project. However, Wessel *et al.* [262] came to the conclusion that exploiting social networks to divulgate fake information is not an aid to the cause and does not increase the total gathered funds. Essentially, the use of social networks to support a project consists in posting updates and promoting it in the webpages and CF platforms. What kind of post should be published in a specific social network is crucial. For example, solicitation works better on Facebook, while informative messages work better on Twitter because of the nature of social networks [30]. At the same time, updates about the project are more appreciated if posted on CF platforms rather than on Twitter.

Another important aspect related to social interaction and the success of CF is the backers' funding intentions. The social exchange theory highlights how important the value perceived by the counterparties is during social interactions in order to increase the benefit everyone can extract from the other part. For this reason, if founders are able to satisfy the backers' funding intentions, the likelihood of success of their project increases because backers perceive a higher value on their side. Zhao *et al.* [276] and Liang *et al.* [159] showed how trust, commitment, and perceived risk are three important factors that affect funding intentions and that they should be taken into account by founders if they want to maximize the investment of the backers.

Finally, while social interactions can help founders to realize how to direct the crowd, on the other hand, there are also certain psychological aspects that should be underlined. The most important is the co-ownership perception that backers could have when they decide to support a project. Co-ownership

TABLE V  
MAIN PUBLICATION OUTLETS FOR CF RESEARCH

Source	N. Articles	N. Forward citations	N. CPA	Ranking	Category	Subject area
<b>Small Business Economics</b>	10	37	3,7	#8/195	Business, Management and Accounting	General Business, Management and Accounting
				#38/564	Economics, Econometrics and Finance	Economics and Econometrics
<b>Journal of Business Venturing</b>	8	742	92,8	#1/169		Management of technology and Innovation
				#2/340	Business, Management and Accounting	Business and International Management
<b>Entrepreneurship: Theory and Practice</b>	7	314	44,9	#7/564	Economics, Econometrics and Finance	Economics and Econometrics
				#9/340	Business, Management and Accounting	Business and International Management
<b>Venture Capital</b>	6	153	25,5	#55/226	Economics, Econometrics and Finance	Finance
<b>Strategic Change</b>	5	8	1,6	#106/195	Business, Management and Accounting	General Business, Management and Accounting
				#129/226	Economics, Econometrics and Finance	Finance
<b>Management Science</b>	5	82	16,4	#7/137	Decision Sciences	Management Science and Operations Research
				#22/370	Business, Management and Accounting	Strategy and Management
<b>New Media and Society</b>	4	40	10,0	#4/285	Social Sciences	Communication
				#21/1028		Sociology and Political Science
<b>Journal of Business Research</b>	4	33	8,3	#19/157	Business, Management and Accounting	Marketing
<b>Decision Support Systems</b>	4	17	4,3	#3/249	Arts and Humanities	Arts and Humanities (miscellaneous)
				#8/283	Psychology	Developmental and Educational Psychology
				#6/76	Business, Management and Accounting	Management Information Systems
				#21/251	Computer Science	Information Systems
				#10/81	Decision Sciences	Information Systems and Management
<b>California Management Review</b>	4	25	6,3	#20/370	Business, Management and Accounting	Strategy and Management
<b>Research Policy</b>	4	4	1,0	#1/137	Decision Sciences	Management Science and Operations Research
				#8/370	Business, Management and Accounting	Strategy and Management
				#6/169	Business, Management and Accounting	Management of technology and Innovation

Note: The Table illustrates the main publication outlets (with at least four published articles) for the articles on CF. The Table reports, for each journal, the number of articles, the total number of forward citations, the average number of citations per article (CPA), the journal's ranking, category and subject area.

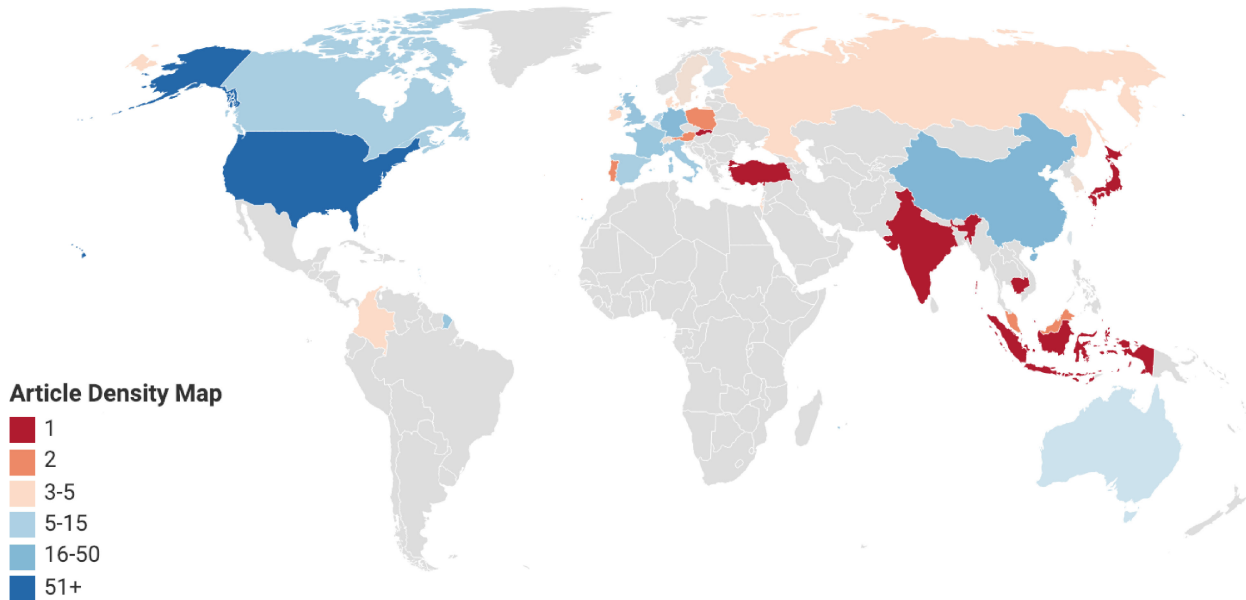


Fig. 6. Density map of CF research. *Note:* The chart was realized with VOSviewer.

TABLE VI  
TOP FIVE INSTITUTIONS OF THE AUTHORS' AFFILIATIONS IN TERMS OF NUMBER OF ARTICLES

Institution	N. Articles	N. Authors	N. Forward Citations	N. CPA
Southwestern University of Finance and Economics, China	7	3	89	12,71
University of Minnesota, USA	7	5	326	46,57
University of California, USA	5	7	12	2,40
University of North Carolina, USA	5	5	28	5,60
University of Pennsylvania, USA	5	2	487	97,40

TABLE VII  
DISTRIBUTION OF THE ARTICLES BY NUMBER OF FORWARD CITATIONS

N. Forward Citations	N. Articles	% of Articles
$\geq 150$	3	2%
$\geq 100$	1	1%
$\geq 50$	10	8%
$< 50$	118	89%
<b>Grand Total</b>	<b>132</b>	<b>100%</b>

is the consequence of cocreation [281]. Cocreation gives the backer a perceived control of a project and an intimate knowing of it. All these aspects trigger a psychological sense of ownership. The other aspect is the influence of sentiment on the description of a project. Wang *et al.* [255] analyzed the impact that sentiment has on the success of a CF campaign, considering the language used to describe the project. Their results suggest that an attentive use of language with sentiment can increase the backers' propensity to fund a project.

#### IV. BIBLIOMETRIC ANALYSIS

In this section, we report the result of the bibliometric analysis, with the aim of quantitatively describing the status and the trends in the literature on CF. We first provide statistics on how the thematic and subthematic areas identified in the previous

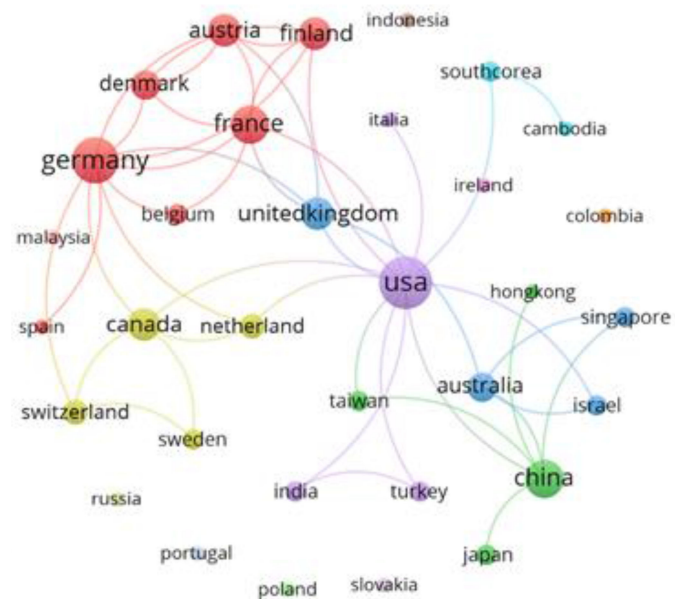


Fig. 7. Cross-country collaborations in CF research.

sections are covered by the academic literature. We then focus on the scientific outlets where CF research is published and the geography of the published works. Finally, we provide a bibliometric analysis of citations and co-authorship.

##### A. Statistics of the Articles According to the Thematic Area

Overall, the thematic area that has been discussed the most in the literature is "CF Characteristics," which alone amounts to around 54% of the considered publications (116 articles out of 213). Most of the works are concentrated on this topic because research initially had the goal of providing a clear overview of the phenomenon. Researchers then started to study CF in more



Fig. 8. Geographic distribution of the institutional affiliations of the considered authors. *Note:* The chart was realized with VOSviewer.

detail, exploring the determinants of success of CF campaigns. As Fig. 1 illustrates, “CF Campaign” totals 33% of the publications (70 papers). A lower number of studies examined the role of the involved actors. The macrothematic “CF Actors” area totals 13% of the published works (27 papers).

Table I describes the percentage distribution of the analyzed articles within the different thematic areas and subthematic areas. More than 50% of the publications are included in the “CF Characteristics” macroarea; publications tend to be distributed uniformly across two subthematic areas (Impact on entrepreneurship, 27%; Forms of CF, 25%). Many papers have simply focused on the usage and purposes of CF (42%), while a few have dealt with the regulatory framework (6%). For the thematic area CF Campaign, most of the interest of academics concerns what determines the success of a campaign (53% of the papers). Within the “CF Actors” thematic area, 56% of the papers deal with the motivation of Backers and Fundraisers and 44% with the Types of Actors.

An important aspect concerns the evolution of research on CF. CF began to be studied in 2010 (the year of the first publication). As Fig. 2 shows, the first years are characterized by publications that deal with CF Characteristics. Even though these aspects continued to remain prominent over the years, CF Campaign and CF Actors started to be examined as research areas from 2013 onward (see Table II).

We classified the collected papers in terms of typology of study. As illustrated in Table III, the majority of the papers are quantitative studies that count for 56% of the sample, followed by qualitative (16%), theoretical (26%), and literature review (2%) studies. The CF Campaign and CF Actor thematic areas are mainly characterized by quantitative studies. Table XIII

in the Appendix reports all of the analyzed publications, their categorization (thematic and subthematic areas) and the type of investigation.

The empirical studies on CF have mainly focused on reward-based CF. As reported in Fig. 3, one paper out of two is related to this CF form. This result may be explained by the greater popularity that reward-based CF has in the US, which, as it will be seen in the following sections, hosts the most active scholars in the field. Equity CF is the second most studied CF form, with many papers published by scholars working in European institutions.

Not surprisingly, the US data are also the mostly commonly used in empirical studies (see Fig. 4). More than 40% of the studies have examined data from US-based CF platforms. Overall, this analysis shows the scholars’ tendency to use data from a single platform/or data from a single country, thus indicating the need for additional studies that employ multicountry data.

The empirical studies on CF often adopt a campaign level of analysis, i.e., they focus on the description of the campaign and its determinants of success. Only a few scholars have investigated investors and/or platform level studies. This trend is confirmed across CF forms, as reported in Table IV.

### B. Journals

Table V illustrates the top sources in which papers on CF are published (with more than four publications) on the basis of the number of articles. The Table includes information about the articles on CF published in each source (i.e., number of articles, total number of citations, citations per article) and the journal (i.e., ranking, category, and area). In general, the articles

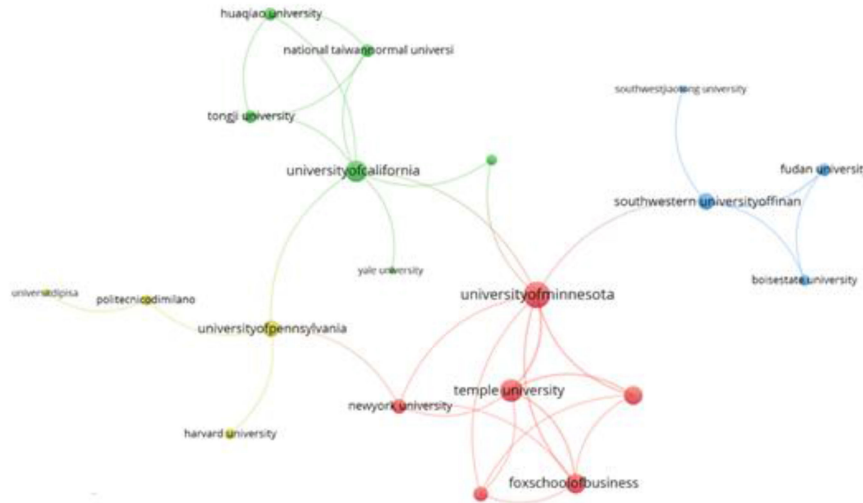


Fig. 9. Cooperation network among institutions. *Note:* The chart was realized with VOSviewer.

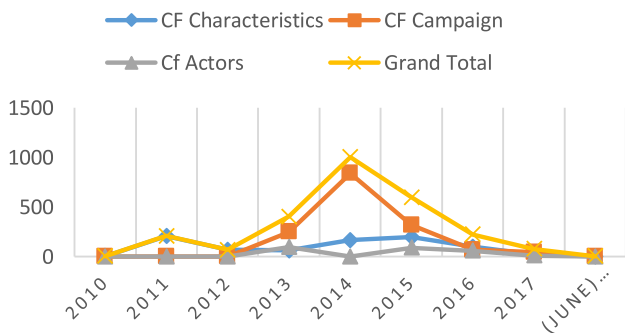


Fig. 10. Trend in forward citations per year (CPY) according to the thematic area.

included in the sample have been published in 144 different sources. The top sources mentioned in Table V published 61 articles out of 213 (less than 30%). The top three journals include 25 articles (11.7%) and overall collect more than 1000 citations. The top three journals rank high in their reference category: *Journal of Business Venturing*, *Small Business Economics*, and *Entrepreneurship: Theory and Practice*.

The Scopus database provides information on the subject area that each journal which publishes CF research is associated with. CF has generated a disruptive change in different research areas: e.g., financing and business administration. Considering the Scopus classification into subject areas, it emerges that 60% of the publications are included in the Business Management and Economics areas (see Fig. 5). The publications that are part of the aforementioned subject areas are mainly related to CF Characteristics. The Computer Science and Social Sciences categories represent 30%: these categories mostly include publications related to the Success Determinant subthematic area.

### C. Geography of Published Works

Fig. 6 illustrates the frequency of the articles on the basis of the geography of the authors' institutional affiliations. Dark

TABLE VIII  
TOP 20 ARTICLES ACCORDING TO THE NUMBER OF FORWARD CITATIONS AND FORWARD CITATIONS PER YEAR (CPY)

Article	Year	N. Forward Citations	N. CPY
[182]	2014	436	87,2
[19]	2014	290	58,0
[191]	2011	206	25,8
[37]	2013	144	24,0
[3]	2015	97	24,3
[101]	2013	95	15,8
[59]	2015	93	23,3
[2]	2015	66	16,5
[18]	2013	63	10,5
[279]	2014	62	12,4
[38]	2014	59	11,8
[36]	2015	59	14,8
[1]	2014	57	11,4
[4]	2015	50	12,5
[39]	2015	43	10,8
[239]	2013	39	6,5
[48]	2012	35	5,0
[183]	2016	30	10,0
[152]	2014	29	5,8
[249]	2016	29	9,7

blue refers to the presence of a high concentration, at a country level, of authors who study CF, while dark red indicates that few authors have dealt with CF. Overall, authors from 230 different institutions study and/or have studied CF. Most of them are located in Europe and in the US, but an important community has also developed in Chinese institutions. Most of the articles were written by authors from the US. We double counted the articles written by authors from different countries. The US counts a total of 123 papers, and is followed by China (41) and Germany (38). The US alone covers 57.7% of the publications.

It is also interesting to consider the network of collaborations among countries. Fig. 7 shows that the US, China, and Germany have intense relationships and their clusters are interconnected. However, Germany is connected more with other European countries; the US is a central reference point and its principal reference in Europe is the UK. Finally, China is connected more

TABLE IX  
TOP 20 ARTICLES ACCORDING TO THE NUMBER OF FORWARD CITATIONS PER  
ARTICLE WEIGHTED BY THE PUBLICATION DATE (CPAW)

Article	Year	N. forward citations	First publication day	CPAW
[182]	2014	436	01/01/2014	0,27
[19]	2014	290	01/01/2014	0,18
[3]	2015	97	01/07/2015	0,09
[37]	2013	144	01/09/2013	0,08
[191]	2011	206	01/03/2011	0,08
[59]	2015	93	01/01/2015	0,07
[2]	2015	66	01/07/2015	0,06
[101]	2013	95	01/12/2013	0,06
[36]	2015	59	01/01/2015	0,05
[38]	2014	59	01/09/2014	0,04
[279]	2014	62	27/03/2014	0,04
[183]	2016	30	01/06/2016	0,04
[4]	2015	50	01/01/2015	0,04
[39]	2015	43	01/05/2015	0,04
[1]	2014	57	01/01/2014	0,03
[18]	2013	63	03/05/2013	0,03
[249]	2016	29	12/02/2016	0,03
[239]	2013	39	25/10/2013	0,02
[152]	2014	29	16/07/2014	0,02
[48]	2012	35	30/03/2012	0,02

TABLE X  
TOP TEN AUTHORS (IN TERMS OF NUMBER OF PUBLISHED ARTICLES) IN CF  
RESEARCH

Author	Country	Institution	N. articles	N. forward citations	CPA
Zheng, H	China	Southwest University of Finance and Economics	7	87	12,4
Gleasure, R	Ireland	University College Cork	6	24	4,0
Rossi-Lamastra, C	Italy	Politecnico di Milano	5	110	22,0
Feller, J	Ireland	University College Cork	4	13	3,3
Mollick, E	USA	University of Pennsylvania	4	476	119,0
Ghose, A	USA	Stern School of Business	4	247	61,8
Schwienbacher, A	France	SKEMA Business School- Université Côte d'Azur	4	359	89,8
Vismara, S	Italy	Università degli Studi di Bergamo	4	39	9,8
Wang, T	China	Southwest University of Finance and Economics	4	19	4,8
Burich, G	USA	University of Minnesota	4	247	61,8

with countries in Asia. Only six countries are isolated from the others. These are cases of sporadic publications with limited influence on the overall academic panorama.

Fig. 8 is a map of the locations of the institutions involved in CF research. Table VI highlights the top five institutions, in terms of number of published articles. The Southwestern University of Finance and Economics (China) and the University of Minnesota are in the first position on the basis of the number of articles. However, the University of Minnesota is in the first position for the number of authors and citations. It should be noted that all the institutions are located in the US, with one exception (the Southwestern University, which is located in China). A total of 29 articles have been published by the top five institutions (13.6% of all the articles). This demonstrates a certain dispersion of CF research across countries and institutions.

Fig. 9 highlights the collaboration network among the institutions of the authors' affiliation. The graph does not include all the institutions, because most of them are not interconnected (the

dispersion is high). Some of the clusters are worthy of noting. The University of California cooperates with some universities in Asia, such as National Taiwan Normal University or Tonji University. The University of Minnesota is an important reference in the US, but is also connected with institutions located in Asia. Finally, the University of Pennsylvania collaborates with institutions in Europe, and in particular with the United Kingdom and Italy.

#### D. Bibliometric Analysis: Citations and Coauthorship

In this section, we present the results of the bibliometric and coauthorship analyses. We first illustrate the results of the forward citation analysis, by which we mean the citations that the articles received from other scientific works (see Table VII). Forward citations are generally regarded as reflecting the relevance and scientific impact of a paper. The number of forward citations is generally relatively low: three articles exceed 150 forward citations and one exceeds 100. Unfortunately, the information about forward citations is only available for 132 out of the 213 articles. Almost 50% of the papers have less than 50 forward citations. The average number of forward citations of the selected papers is 12.12 (ranging between 0 and 436). The values remain low because there is a high number of papers that have no forward citations. Indeed, only a few articles have exerted a considerable influence. Taking into account the thematic areas, CF Campaign is positioned well above the average, with an average of 21.91 forward citations. This confirms the prevalence of this theme in CF research over the considered time span. CF Characteristics averages 6.98. Finally, CF Actors is the least cited thematic area: the average is 9.33. It is also interesting to consider forward citations on the basis of the type of study. In this case, two out of the five categories surpassed the average: Qualitative (17.61) and Quantitative (13.75) studies. These results clearly confirm the predominant relevance of these types of studies over the other categories, such as Literature Review (2.8) and Theoretical studies (5.8).

Fig. 10 illustrates the trend in citations per year (CPY) over the considered years. CPY increases until 2014 and then starts to gradually decrease. This aspect is especially evident when considering the CF Campaign thematic area. In fact, the number of publications has increased over the years as has the interest in CF. Taking a quick look at Fig. 10, it would seem that the attractiveness of the topic began to decrease in 2014.

Table VIII includes the top 20 articles on the basis of the number of forward citations and CPY. The first two articles [19] and [182] were both published in 2014 and together account for a total of 726 forward citations, almost 40% of all the forward citations in the top 20 articles. The other relevant articles do not go beyond 2015 as the year of publication. We also calculated the number of forward citations per article weighted by the publication date (CPAW), in which the number of days from the publication to the target date (end of June 2018) is in the denominator. This measure is better able to capture the academic relevance of an article, because it solves the problem pertaining to the fact that older articles within the same year likely show a higher number of citations than more recent ones. The top 20

TABLE XI  
DISTRIBUTION OF THE ARTICLES BY NUMBER OF BACKWARD CITATIONS

N. Backward Citations	N. Articles	% of Articles
$\geq 150$	1	1%
$\geq 100$	13	7%
$\geq 50$	60	33%
$< 50$	90	49%
0	19	10%
<b>Grand Total</b>	<b>183</b>	<b>100%</b>

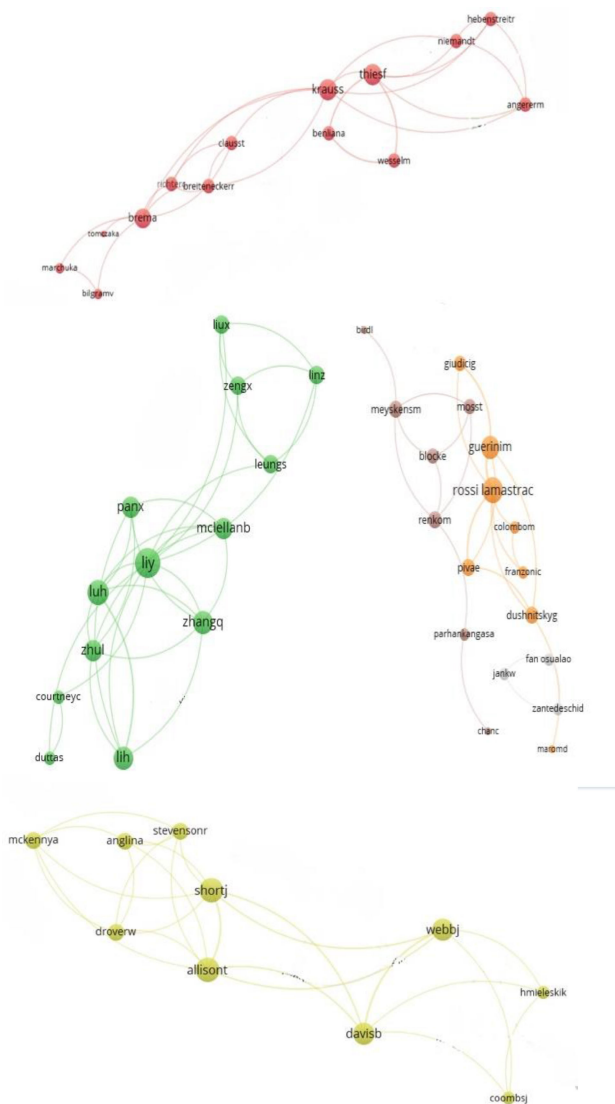


Fig. 11. Coauthorship network, with clusters composed of five or more authors. *Note:* The chart was realized with VOSviewer.

articles partially maintain their positions, when CPAW is taken into account (see Table IX). The first two positions remain the same, whereas the others change slightly. Ordanini *et al.* [191] switches with Ahlers *et al.* [3], while Gerber and Hui [101] lose positions.

In terms of coauthor analysis, the average number of authors per paper is 2.48, with a peak of 7 for Zhu *et al.* [283]. The

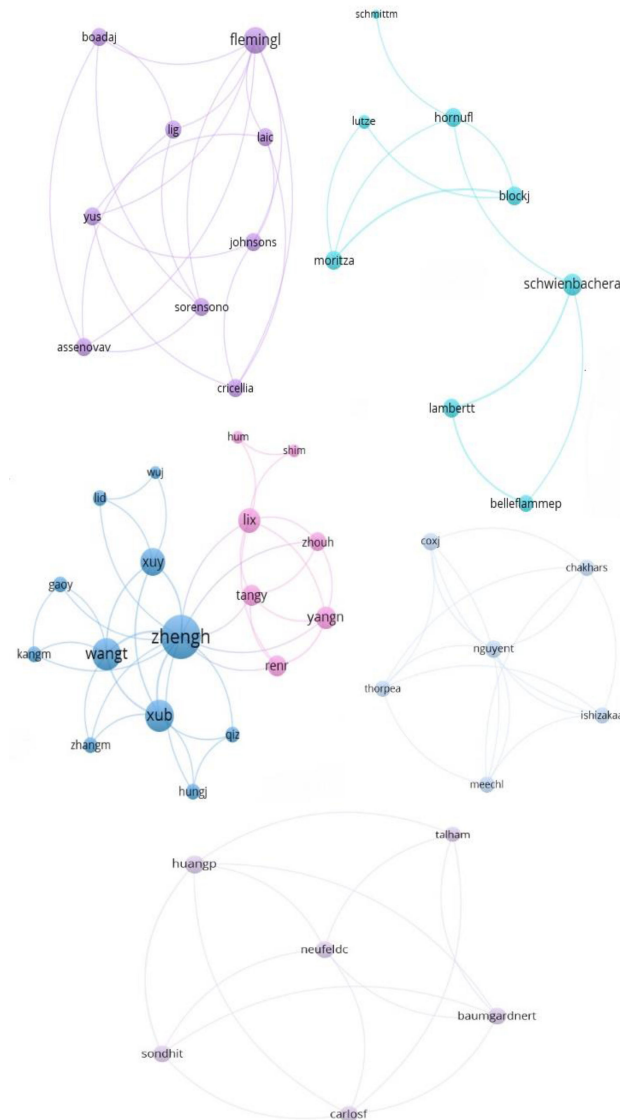


Fig. 12. Coauthorship network, with clusters composed of five or more authors. *Note:* The chart was realized with VOSviewer.

situation remains almost the same when all the thematic areas are considered: CF Characteristics registers the lowest average, with 2.22 authors per article, whereas CF Campaign has an average of 2.83 (higher than the general average). Finally, CF Actors averages 2.70 authors per article, and is also above the general average. In terms of number of coauthors, 164

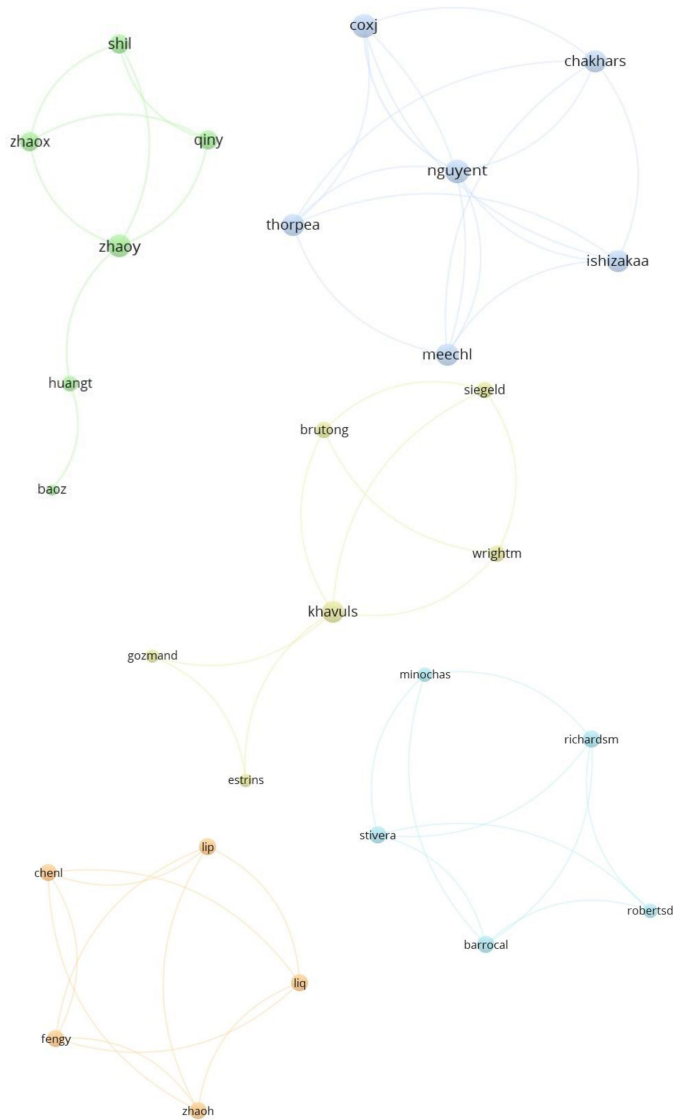


Fig. 13. Coauthorship network, with clusters composed of five or more authors. *Note:* The chart was realized with VOSviewer.

articles have more than one author. As a consequence, almost a quarter of all the publications were published by only one author. The majority of the papers were written by two or three coauthors.

We also analyzed the top ten authors, in terms of number of published articles (see Table X). H. Zheng holds the first place, with seven published articles, but with a CPA equal to only 12.4. Irish and Italian authors cover the subsequent three positions (R. Gleasure, C. Rossi-Lamastra, and J. Feller), with six, five, and four publications, respectively. However, it is an American author who has had the largest impact on CF research: Mollick, who, with his four publications, has collected 476 forward citations, thereby earning an average 119 CPA. While there is a certain vitality of research around the world, the US and China have predominant positions in the CF domain. Other European countries that demonstrate a great dynamism (such as Germany) do not have the same influence, in terms of top authors, as the US and China.

TABLE XII  
DISTRIBUTION OF THE ARTICLES BY NUMBER OF BACKWARD CITATIONS  
ACCORDING TO THE THEMATIC AREA

N. of Backward Citations	Thematic Area						Total	
	CF Characteristics		CF Campaign		CF Actors			
$\geq 150$	1	1,1%	0	0%	0	0%	1	1%
$\geq 100$	3	3%	9	14%	1	4%	13	7%
$\geq 50$	30	32%	21	33%	9	36%	60	33%
$< 50$	52	55%	28	44%	10	40%	90	49%
0	8	9%	6	9%	5	20%	19	10%
<b>Total</b>	<b>94</b>	<b>100%</b>	<b>64</b>	<b>100%</b>	<b>25</b>	<b>100%</b>	<b>183</b>	<b>100%</b>

The coauthorship network is presented in Figs. 11–13. As a result of the high number of authors, the analyzed clusters are the ones that include five or more authors. A total of 16 clusters have these features. Each node on the map is associated with an author: the author can be identified at a specific node by the surname and the first letter of his/her name, which are joined together in one word (for example, Alexander Brem is identified as “Brema”). The graphical representation of the networks is shown in three Figs (Figs. 11–13) because of the high number of clusters. A total of 127 authors are included in the 16 clusters. The largest cluster is composed of 14 authors: they are European authors, mainly from Germany, that collaborate extensively. The cluster composed of 13 authors is that of the Asian authors (Chinese cluster); however, this cluster does not include the most prolific Chinese author, Zheng, who is part of another cluster. The second most prolific author, Gleasure, is not part of any cluster, because most of his publications are not coauthored. Rossi-Lamastra instead is the third most prolific author, with all her articles being coauthored.

We also performed a backward citation analysis (see Tables XI and XII). In this case, information was only available for 183 papers out of 213. The selected papers present an average of 44.08 references. The maximum number of references is 159 and the minimum is 0. According to the previous results, CF Campaign is the thematic area that relies the most on prior studies. In fact, the average number of references reaches 52.5, which is above the average. CF Characteristics is positioned close to the average (40.21). CF Actors is not so distant, with an average number of references of 36.56. The overview of the average number of references according to the type of study has confirmed the expectations: Qualitative and Quantitative analyses are the works with the most backward citations, with on average 56.12 and 47.08 backward citations, respectively. Theoretical studies lie in the third position, with an average of 33.07. Literature Review and Interview close the list with 23.67 and 0.5 backward citations, respectively.

## V. CONCLUSION AND FUTURE RESEARCH

The aim of this article was to analyze how research is dealing with CF and illustrated its trends. We divided the literature into three main categories: “CF Characteristics,” “CF Actors,” and “CF Campaign.” During the years, CF has been studied by academics from different perspectives. At the beginning, it was essential to have a clear view of the phenomenon and visualize the entire panorama around CF. Researchers then started to

focus on CF Campaign, the role of the involved actors, and the fundamental impact social networks and the crowd have on the diffusion and the success of funded projects. Indeed, the first articles to be published were ones that dealt with “CF Characteristics”; in particular, researchers started analyzing the forms of CF, the impacts on society and the economy, the purposes, usages, and regulations. The topic is currently mainly studied by economists and business management researchers, but also by computer scientists, psychologists, and sociologists. The interest in CF has mainly spread in the US and China (i.e., although it is also now largely debated in Europe).

Our review has highlighted a few interesting research gaps. Currently, the majority of the empirical works on CF focuses on reward-based CF, while comparatively limited evidence is available on other CF forms. Thus, scholars could consider concentrating their efforts on filling this gap, in particular related to donation-based CF, where the motivations behind investments and the campaign dynamics may be very different from other CF forms [108]. The analysis has also highlighted a significant opportunity to contribute to the CF literature by conducting studies that analyze multiple CF forms together. The current state of the art on CF has neglected this article question to a great extent, hence, our understanding on the relationships among these different CF forms remains rather limited (see [56] for an exception). In addition, our bibliometric study has shown that the majority of published works examined data from US-based CF platforms. This may suggest caution when generalizing the results to other countries, particularly when cultural differences and/or different institutional settings exist. The bibliometric analysis has also highlighted a disproportionate focus on campaign-level studies, conducted in order to describe the determinants of CF success. While this appears very reasonable, given the data availability, it leaves a number of relevant research questions open related to postcampaign performances, investors’ and entrepreneurs’ motivations to use CF, the role of platforms, and the factors that influence local CF markets. These topics have broadly been understudied, in particular related to donation and equity based CF.

It is evident that it is now necessary to establish what happens after the CF campaign: a few papers have been written on this topic in the last few years (e.g., [78], [212], [223], [229]). So far, CF has been reported as a key funding means to overcome the equity gap, especially in the early stage of a start-up. However, this view has not been supported by strong scientific evidence. Accordingly, the understanding of postcampaign performances appears a promising area of investigation. This article line should focus on understanding the financial performances of companies that use CF to fund their projects. Such research could quantify the effect of having received money from the crowd, compared to the cases of having received money from other professional investors or of not having obtained any external financing. The use of appropriate econometric techniques (e.g., using matching techniques or taking advantage of a regression discontinuity design) may provide interesting results to compare different entrepreneurial funding sources and inform the policy debate on CF. The debate on postcampaign performances could also benefit from studies aimed at assessing the linkage between CF and

other entrepreneurial finance actors. Currently, two competing views have been advanced about this issue. On one hand, having achieved success in a CF campaign legitimates a start-up to operate on the market [152] and this may be interpreted by other investors as a signal of good quality. Accordingly, success in CF should be positively associated with the probability of attracting further investments [80]. On the other hand, CF implies the involvement of a crowd of shareholders that can hinder the strategic choices of entrepreneurs, as well as increase agency costs. Following this line of reasoning, success in CF should discourage professional investors from providing additional funding and therefore should be negatively associated with the probability of attracting further investments. Whether the first or the second dynamics prevails is still an open debate, which justifies the scientific investigation of such a topic. As noted in this literature review, obtaining financing is not the only benefit associated with a CF campaign. Therefore, future studies interested in assessing the impact of CF on start-up performances should take into account the multifacet role of backers. In this respect, we believe studies on nonfinancial performances are crucial. Future works might focus on understanding how interactions with backers influence product development, with the aim of assessing whether CF is a setting that favors open innovation. The study of the interactions with backers also paves the way toward research that assesses the hidden costs of CF. Managerial literature has noted that many risks are associated with a very large endowment of social capital [244]. Although the social capital theory has been widely used in CF, prior research has always taken a positive approach, highlighting how social capital developed within CF platforms can help the entrepreneur (see [59]). Here we stress the importance of also investigating the dark side of developing large social capital over a short period of time.

Another topic which has not received sufficient attention so far is the understanding of the motivations of fundraisers to choose CF rather than other funding means. The commonly accepted view is that CF is used when other funding sources are not accessible. However, the scientific evidence in support of this argument is rather scant. Moreover, there are reasons to argue that CF is not merely a “last resort,” and that it may instead represent a credible substitute for other financing means. Indeed, seeking financing from traditional equity investors is a choice which may also engender drawbacks. First, it is a costly activity (e.g., considering the cost of preparing the documents, of attending investor events, etc.). Second, traditional investors often have sufficient bargaining power to obtain favorable contractual conditions at the expense of entrepreneurs [117]. Third, after the investment, the agency relationship between traditional investors and entrepreneurs may engender conflicts that are detrimental to start-ups [177], [243]. In addition, it has widely been pointed out in the literature that traditional investors often replace original founders ([110], [117], [257], [258]). In light of the above, it is possible to argue that entrepreneurs might avoid seeking financing from traditional investors and instead prefer equity CF, which does not entail many of the former pitfalls.

Finally, despite its web-based nature, the existing research has often reported that CF remains influenced by local characteristics to a great extent, both in terms of national CF market

growth [83] and activism of cross-border investors [274]. The understanding of the reasons why some countries are less active than others is still rather limited (see [79] for a descriptive study in this direction). As such, there is still room to contribute to such a debate.

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