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## **The Knowledge Spillover Effect of Crowdfunding**

Carla Martínez-Climent, Leonardo Mastrangelo and Domingo Ribeiro-Soriano

Business Administration Department, University of Valencia, Valencia, Spain

### **Abstract**

Knowledge exerts a positive indirect effect on the external environment. However, not all innovations are transferred to companies and society to allow such an effect to occur. Given the existence of knowledge filters that prevent the commercialisation of products, entrepreneurship is considered a mechanism for knowledge transfer because ideas are embodied in business creation. The difficulty of attracting funding has been identified as a barrier to commercialising knowledge. This barrier can be lowered using alternative sources of financing such as crowdfunding. Therefore, crowdfunding can help bring to market those ideas whose knowledge spillover has a knock-on effect on society. This article focuses on the role of reward-based crowdfunding in knowledge transfer, innovation and knowledge spillovers. Based on fuzzy-set qualitative comparative analysis of data on 53 entrepreneurs, the empirical results show that the role of investors in reward-based crowdfunding is crucial to enhance entrepreneurs' ideas and enable the indirect effect of knowledge on society.

**Keywords:** reward-based crowdfunding; knowledge spillover; innovation; society; knowledge spillover theory of entrepreneurship

## 1. Introduction

The importance of knowledge production and generation stems from both their direct effects and the spillover that is created. Unlike spillages of liquid, which normally cause waste, spillages of learning and ideas often create positive effects on the external environment. Investment in human capital builds knowledge, which then indirectly affects a host of sectors. For example, in an open innovation process, research and development (R&D) or some other knowledge creation process generates not only positive economic effects but also social benefits (Arena, Bengo, Calderini & Chiodo, 2018; González-Moreno, Díaz-García & Sáez-Martínez, 2018; He, Guaita-Martínez & Botella-Carrubi, 2019; Roper, Vahter & Love, 2013). Bloom, Schankerman, and Van Reenen (2013) empirically studied the social returns of companies with R&D policies, concluding that the social returns exceed the private returns. Ogawa, Sterken, and Tokutsu (2019) extended Bloom et al.'s (2013) research, finding that marginal social returns are higher than marginal private returns in R&D-intensive countries.

In developed economies, the incentive to innovate has become a key way of contributing to economic development (Lehmann & Menter, 2018). However, not all innovations are transferred to enterprises and society to allow this contribution to take place. According to the knowledge spillover theory of entrepreneurship, certain knowledge filters prevent the commercialisation of products (Jarchow & Röhm, 2019). Accordingly, entrepreneurship is considered a mechanism for knowledge transfer because ideas are embodied in business creation (Qian, 2018). External agents are often separate from the generators of knowledge, but they still influence the commercialisation of knowledge (Acs, Braunerhjelm, Audretsch & Carlsson, 2009; Jarchow & Röhm, 2019).

Knowledge filters are the barriers that prevent knowledge from being transformed into an activity that drives economic growth (Ghio, Guerini, Lehmann, & Rossi-Lamastra,

2015; Jarchow & Röhm, 2019). The knowledge spillover theory of entrepreneurship suggests that entrepreneurship achieves economic growth by encouraging diversity, competition and innovation amongst companies (Audretsch, 2007). Entrepreneurship further drives economic growth by promoting employment and learning (Block, Thurik, & Zhou, 2013). One key point of governments is to create economic growth. Creating a strong entrepreneurship ecosystem through private sector engagement, proper legislation and promoting clusters and incubators lead to sustainable venture creation stimulation and thus to development (Isenberg, 2010; Boutillier, Carré & Levratto, 2016).

Clayton, Feldman, and Lowe (2018, p. 105) identified five differentiable elements in the literature on ecosystems that can help explain the different components of entrepreneurship and the different dimensions that affect it. These differentiable elements are “university technology transfer and licensing offices; physical space (incubators, accelerators, and co-working spaces); professional services providers; networking, connecting, and assisting organizations; and finance providers (including venture capital, angel investors, public financing, and crowdfunding)”. The entrepreneurial ecosystem has been also defined as the combination of policy, finance, culture, supports, human capital, and markets (Liguori, Bendickson, Solomon & McDowell, 2019).

Two related problems that commonly impede the commercialisation of ideas through entrepreneurship are the scarcity of financial resources and difficulties attracting private and public funding (Ahmad, Halim, Ramayah, Popa & Papa, 2018; Dezi, Leone, Schiavone, & Simoni, 2019). These problems, which are discussed in the literature, can be mitigated using alternative sources of finance such as crowdfunding. Crowdfunding can help with the commercialisation of ideas whose knowledge spillover benefits society.

Crowdfunding lets entrepreneurs finance their projects through a crowd of investors who, in exchange for their investment, receive a reward that is either monetary or non-

monetary depending on the type of crowdfunding. Reward-based crowdfunding gives investors a material asset. Crucially, the primary objective of crowdfunding investors might not be the dissemination of knowledge but the obtention of a reward in the form of payment in kind or some kind of monetary gain (Bi, Liu, & Usman, 2017; Steigenberger, 2017). However, investors and entrepreneurs nonetheless exchange ideas, experiences and advice. This form of networking generates indirect knowledge that positively affects entrepreneurs' crowdfunding projects and generates the transfer of knowledge to society. Therefore, using crowdfunding as a financing tool has an indirect effect, namely knowledge spillover. Moreover, because crowdfunding is a novel business model where digital technologies provide the main channel for the dissemination of knowledge, the role of digitalisation is highly relevant. It is also of interest to study the effect of this digitalisation on knowledge spillovers and the proximity of investors (Ghio et al., 2015). Therefore, this article focuses on the role of investors, namely reward-based crowdfunders, in knowledge transfer, innovation and knowledge spillovers.

Crowdfunding has revolutionised the way ventures are funded, changing the status quo as regards use of the banking system as the established provider of finance (Felicio, Rodrigues, Grove, & Greiner, 2018). In addition, crowdfunding relies on the Internet. Thus, the channel through which funding is distributed and the environment where this distribution takes place are different from in the traditional funding model. Crowdfunding offers a new way for private capital to be collected and distributed. In doing so, it contributes to the development of ideas and minimises geographical barriers in the innovation process (Cillo, Rialti, Bertoldi, & Ciampi, 2019; Nucciarelli et al., 2017).

Digitalisation affects economic activity by changing companies' business models environment (Gupta & Bose, 2019; Kraus, Roig-Tierno & Bouncken, 2019). The access to information through Internet and the organization of firms and individuals by means of using

it, makes business models and entrepreneurship different. Specifically, digital entrepreneurship is the transfer of a part of the business into digital (Kraus, Palmer, Kailer, Kallinger & Spitzer, 2019). In the digital sector, geographical clustering is now less necessary to develop products and services or to interact, communicate and access markets (Evans, 2019) because these actions have become digitally intrinsic characteristics of many sectors (Autio, Nambisan, Thomas, & Wright, 2018; Rippa & Secundo, 2019).

Obtaining financing through tools such as crowdfunding, which use technology and the Internet, has different nuances than obtaining economic resources through Business Angel for example. A clear distinction is the "in situ" experience of the Business Angel versus the online contact experienced by both parties through the platform. Geographic space should not be confused with the flow of information and ideas: in Business Angel there is an exchange of ideas intrinsic to the event; while in crowdfunding there are other tools to provide feedback. Some platforms conduct surveys just after the investor commits its capital to the project. These surveys ask the reasons to invest in the project (e.g. expected profitability, innovative idea, emotional connection, etc.) among other questions. In addition, certain platforms send questionnaires to investors and after they inform the entrepreneurs about the backers' perception.

The most innovative aspect of some CF platforms is the possibility of posting comments on CF projects, creating a closed social network promoted by the platform itself and which can only be accessed by backers and companies or entrepreneurs. Thus, an information flow is generated that leads to a further step in the contribution of CF. First of all, Crowdfunding 1.0. allows to obtain economic resources. In the most developed aspect of it, Crowdfunding 2.0. allows obtaining financing and also the exchange of ideas and knowledge, helping the entrepreneur to continue with the development of the project.

On this basis this article presents theoretical analysis of the traditional approach to knowledge spillovers. Analysis of the evolution of knowledge spillovers is also presented. The knowledge spillover theory of entrepreneurship is used to link knowledge spillovers and entrepreneurship to crowdfunding. Empirical analysis was conducted using fuzzy-set qualitative comparative analysis (fsQCA). The analysis was performed using data on 53 entrepreneurs who have participated in two reward-based crowdfunding platforms in Spain. The results show that the role of reward-based crowdfunding investors in improving entrepreneurs' ideas is crucial for knowledge to exert an indirect effect on society.

## **2. Theoretical framework: success factors in knowledge spillovers to society**

[Figure 1 near here]

### **2.1. Knowledge spillovers**

Marshall (1890) noted the existence of positive external economies when companies in the same industry cluster together in the same geographical location. Three conditions are cited for this situation to occur: the local availability of inputs, the presence of qualified workers and indirect knowledge (knowledge spillovers). These externalities, which were described in 1890, have developed in accordance with the evolution of the economy and society (Giuliani, 2007; Pietrucha & Żelazny, 2019).

Research in this area has traditionally focused on the relationship between knowledge spillovers, geographical proximity and cluster formation (Bocquet & Mothe, 2010; Bönnte, 2008; Döring & Schnellenbach, 2006; Gallié, 2009; Streb, Baten, & Yin, 2006). The reasons for this orientation include the fact that knowledge-creating institutions such as universities or research centres train graduates, who acquire and then transfer knowledge by engaging in intellectual or entrepreneurial pursuits (Ahmad & Widén, 2018). These institutions are able to do so thanks to resources such as high-quality libraries with database access, which are used

to train talented graduates (Acs, Audretsch, & Lehmann, 2013). These graduates then pass on their knowledge or create knowledge by implementing the skills and aptitudes they have acquired.

Scholars have also differentiated tacit from scientific knowledge. It has been argued that scientific knowledge is easier to codify through scientific articles, patents, and so on (Fernández-Vázquez & Álvarez-Delgado, 2019; Guo-Fitoussi, Bounfour, & Rekik, 2019), whereas tacit knowledge is harder to transfer if individuals are geographically distant from one another (Kogut & Zander, 1992).

One relevant question here relates to the role of the current technological revolution in knowledge transfer. Knowledge acquisition through the Internet is a reality. Business activity and business models are evolving through digitalisation (Autio et al., 2018), as are knowledge acquisition, knowledge dissemination and the knowledge spillover effect.

The most relevant and widely studied theories in this area include the knowledge production function and endogenous growth theory. The main focus of the knowledge production function is to explain how innovation is created. On the one hand university research and R&D are knowledge producing, patent on its effect on industry (Buesa, Heijs, & Baumert, 2010; Fritsch, 2002; Griliches, 1979; Jaffe, 1986, 1989; Madsen, 2008; Ponds, Oort, & Frenken, 2009). On the other, also firms are seen as knowledge-producing and exchanging entities due to individuals within the company are trained and knowledge revert in entrepreneurial actions (Gast, Werner & Kraus, 2017). Instead of focusing on the output of products and services (Cobb-Douglas production function; Solow, 1957), the knowledge production function focuses on innovation (Qian, 2018). Endogenous growth theory, which was advocated by Romer (1990), depicts “knowledge as a driver of long-term economic development” (Qian, 2018, p. 163). Accordingly, private companies invest in R&D to produce innovations that yield long-term benefits (Grossman & Helpman, 1994; Ha &



Howitt, 2007; Martin & Sunley, 1998; Pack, 1994; Öberg & Alexander, 2019). Romer (1990) argued that knowledge spillovers occur automatically in this endogenous growth theory model. However, other researchers (Acs, Audretsch, Braunerhjelm, & Carlsson, 2012; Braunerhjelm, Acs, Audretsch, & Carlsson, 2010; Jerome, 2013; Xu, Wang, Zhou, & Zhang, 2019) later showed the existence of a knowledge filter that prevents knowledge from automatically spreading towards innovation and the commercialisation of ideas (Acs et al., 2013; Jarchow & Röhm, 2019; Johansson, Karlsson, & Stough, 2006). To pass this filter, they advocate the use of entrepreneurship as a driver of business creation that contributes to social development through its use of knowledge. The bibliometric study by Ghio et al. (2015) examined the most relevant articles on the knowledge spillover theory of entrepreneurship, summarising the major research questions in relation to the knowledge spillover theory of entrepreneurship and proposing a promising approach: entrepreneurship as an enhancer of knowledge spillovers.

### *2.1.1. The knowledge spillover theory of entrepreneurship*

Research on entrepreneurship is essentially based on the study of the incentives or characteristics that lead individuals to spot and pursue opportunities to create new companies (Ferreira, Fernandes & Kraus, 2019; Audretsch & Lehmann, 2005; Gimeno, Folta, Cooper, & Woo, 1997; Krueger, Reilly, & Carsrud, 2000; Lumpkin & Dess, 1996). The knowledge spillover theory of entrepreneurship integrates exogenous dimensions such as technological, social and political factors to explain how and why entrepreneurship improves economic performance (Acs et al., 2013) and enhances quality of life and citizens' well-being. The knowledge spillover theory of entrepreneurship is used to explain how scientists or researchers conduct studies by acquiring, disseminating and creating knowledge. Often, however, these ideas do not translate into the creation of companies that improve citizens'

quality of life and contribute to economic development. As mentioned above, certain barriers to knowledge arise in the form of institutional bureaucracy, legal issues, financial constraints, or scientists' weak motivation or lack of the right personal characteristics to become entrepreneurs. Entrepreneurship can eliminate these barriers by enabling knowledge to be brought to market. Therefore, the creation of knowledge-based companies is a crucial way to commercialise ideas through knowledge spillovers and thereby generate economic and social returns (Ghio et al., 2015; Jarchow & Röhm, 2019).

### *2.1.2. Geographical considerations in knowledge spillovers*

Numerous scholars (Acs et al., 2013; Dhanaraj & Parkhe, 2006; Gupta, Tesluk, & Taylor, 2007) have studied geographical proximity as a driver of the diffusion of tacit knowledge. Geographical proximity to the spillover source (Belitski & Desai, 2016) has been reported as a necessary factor for spillover benefits to occur (Lehmann & Menter, 2018). However, other studies (e.g. Autio et al., 2018) have highlighted the effects of digitalisation on economic geography by allowing new relational forms to change established patterns and geographically dispersed groups to coordinate their efforts. As business creation changes and new business models emerge (Autio et al., 2018), the importance of geographical distance may become secondary and knowledge spillover theory may evolve.

Information technology has reduced communication costs, despite massive geographical distances amongst interlocutors. This change has led to the geographical spread of innovative activities resulting from the decoupling of digital opportunities from geographical proximity (Autio et al., 2018; Maznevski & Chudoba, 2000; Yoo, Boland, Lyytinen, & Majchrzak, 2012). Notable innovative activities include financial technology (Fintech) and, specifically, crowdfunding (Clayton, Feldman, & Lowe, 2018; Giusti, Alberti, & Belfanti, 2018). Kim and Kim (2017) also noted the role of crowdfunding in reducing

transaction and research costs, enabling transactions regardless of geographical distances between actors.

## **2.2. Crowdfunding**

Emerging after the economic and financial crisis of 2008, crowdfunding is a form of finance that addresses the financial constraints faced by entrepreneurs, individuals or companies. Drawing on a crowd of investors who funnel capital through online platforms, entrepreneurs, individuals or companies can finance their projects (Clauss, Breiteneker, Kraus, Brem & Richter, 2018). Four types of crowdfunding can be defined depending on the specific type of contractual obligation established between parties. The first is peer-to-peer (P2P) lending, which consists of microloans. Investors (lenders) transfer money to entrepreneurs (borrowers), who later return the microloan plus some pre-agreed amount of interest (Lin, Prabhala, & Viswanathan, 2013; Zhang & Liu, 2012). P2P lending offers a solution to a market segment that has traditionally not been viewed as “bankable” because of a lack of personal assets to guarantee loans and a shortage of professional experience. Accordingly, this form of crowdfunding entails a high risk of loan default, which also means high returns for lenders (Gomber, Kauffman, Parker, & Weber, 2018). In the second type of crowdfunding, equity crowdfunding, entrepreneurs make an open call for investment. In return for their investment, funders receive a stake in the company or a share of future profits (Ahlers, Cumming, Günther, & Schweizer, 2015; Belleflamme, Lambert, & Schwienbacher, 2014; Angerer, Brem, Kraus & Peter, 2017; Niemand, Angerer, Thies, Kraus, & Hebenstreit, 2018; Vismara, 2019; Angerer, Niemand, Kraus & Thies, 2018). In the third type of crowdfunding, reward-based crowdfunding, entrepreneurs offer a non-monetary reward in the form of a product (Belleflamme, Omrani, & Peitz, 2015). Both investors and entrepreneurs benefit because investors are also potential end consumers (Bi, Liu, & Usman, 2017; De

Luca, Margherita, & Passiante, 2019; Kraus, Richter, Brem, Cheng, & Chang, 2016; Mollick, 2014). Finally, in the last type of crowdfunding, donation crowdfunding, the purpose of the capital raised is not to generate a financial gain but to benefit a segment of the population for altruistic reasons (Chen, Dai, Yao, & Li, 2019).

Networking between companies has been studied because it helps the transfer of knowledge, especially tacit and complex knowledge (Cayton et al., 2018; Powell, 1990). In crowdfunding, a relationship is established through two-way online communication (i.e. the exchange of knowledge between the crowd of investors and the entrepreneurs), and innovative discussions are fostered, leading to networking between project funders and creators (Dezi, Leone, Schiavone, & Simoni, 2019). Open innovation is also promoted (Clayton, Feldman, & Lowe, 2018; Ordanini, Miceli, Pizzetti, & Parasuraman, 2011) due to information flow is present in exchange comments on the projects within the platform. This specialised closed social network enables the development of the project.

***Research proposition 1:*** Investors provide useful ideas and feedback to entrepreneurs during reward-based crowdfunding campaigns.

Crowdfunding also raises interesting questions in relation to the acquisition of external knowledge by entrepreneurs who promote their projects on crowdfunding platforms. Entrepreneurs can thus interact with investors, who may be potential consumers, or companies with whom they would like to collaborate with in the future (Dezi, Leone, Schiavone, & Simoni, 2019). Therefore, interaction between agents is essential to provide information on the tastes and interests of investors and consumers. This information also helps the company create future projects that are relevant, understandable and highly innovative, raising their likelihood of success (Dejean, 2019; Kang, Jiang & Tan, 2017). Entrepreneurs need funding, whilst investors seek a return on their savings. In this situation, the experience of the community, particularly that of investors (Dejean, 2019; Mollick &

Nanda, 2015), can yield benefits (Belleflamme, Lambert, & Schwienbacher, 2014). By contributing ideas, investors indirectly promote knowledge, entering into innovative discussions that result in entrepreneurial projects (Dezi, Leone, Schiavone, & Simoni, 2019; Stanko & Henard 2017), the commercialisation of ideas and, ultimately, the transfer of these ideas to society by bringing new business which cover latent necessities.

***Research proposition 2:*** Reward-based crowdfunding entrepreneurs indirectly transfer knowledge to society.

### **3. Method**

The method in this study is based on fuzzy-set qualitative comparative analysis (fsQCA; Fiss, 2011; Ragin, 2014; Schneider & Wagemann, 2012; Woodside, 2014). This method is used to identify paths to success or failure depending on the combination of the presence or absence of a set of relevant conditions (Mendel & Korjani, 2013; Nieto-Aleman, Garcia-Alvarez-Coque, Roig-Tierno & Mas-Verdú, 2019). FsQCA examines the causal conditions that might be necessary or sufficient for an outcome of interest to occur.

FsQCA enables analysis of non-symmetric relationships between observations. This feature is useful in the social sciences, where causal relationships tend to be complex (Fiss, 2011; Roig-Tierno, Gonzalez-Cruz & Llopis-Martinez, 2017; Ryan & Berbegal-Mirabent, 2016). In building sufficiency theories, fsQCA represents an innovative method that provides different configurations of unrelated conditions that lead to a given output (Kraus, Ribeiro-Soriano, & Schüssler, 2018).

#### ***3.1. Outcome and conditions***

The outcome in this study was knowledge spillovers to society. This outcome was defined as the indirect effect of reward-based crowdfunding investments. Six causal

conditions forming three categories were considered: comments by investors to entrepreneurs, knowledge transfer from entrepreneurs to society, and project success.

[Table 1 near here]

Calibration was carried out using fsQCA software. Calibration yields fuzzy-set values expressed in terms of three anchors: full membership (a value of 1), maximum ambiguity (a value of 0.5) and full non-membership (a value of 0). Data were collected using a 5-point Likert-type measurement scale. A score of 4 was taken to represent full membership, a score of 3 was taken to represent maximum ambiguity, and a score of 2 was taken to represent full non-membership (Woodside, Prentice, & Larsen, 2015).

The six conditions referred to entrepreneurs' perceptions of comments by investors towards the entrepreneurs' projects. The first condition (USEF) was the perceived usefulness of comments (Gera & Kaur, 2018); the second condition (GJOB) was the perception that the entrepreneurs had done a good job; the third condition (ERROR) was the perceived recognition of mistakes by the entrepreneurs (Ryu & Kim, 2016); the fourth condition (ACT) was the perceived active contribution of ideas and knowledge to the project (Rome, Petruzzelli, & Perrone, 2017); the fifth condition (OPPOR) was the perceived positive assessment of the opportunity to share resources and help others (Damian & Manea, 2019; Hornuf & Schwienbacher, 2018); the sixth and final condition (FAIL) was the extent to which the product or service was perceived as a failure (Bonini & Capizzi, 2019).

#### **4. Results**

As mentioned earlier, fsQCA is used to identify causal relationships in the form of configurations that lead to a given outcome (in this case, the contribution of crowdfunding campaigns to citizens' well-being). The proposed model can be expressed as follows:

$$\text{Wellness in society} = f(\text{USEF}, \text{GJOB}, \text{ERROR}, \text{ACT}, \text{OPPOR}, \sim\text{FAIL})$$

Note here that “~FAIL” refers to the *absence* of perceived failure. The conditions that lead to success in the promotion of citizens’ well-being are enumerated below.

#### **4.1. Analysis of necessary conditions**

The conditions and outcome were explained in the previous section. This section presents the results of the fsQCA. Table 2 shows the consistency and coverage scores for each condition. Four conditions were deemed necessary for the outcome to occur. Conditions with consistency scores of more than 0.90 (Ragin, 2008; Schneider & Wagemann, 2012) were considered necessary. The combination of the perceived usefulness of comments and the perceived positive assessment of opportunities had a high consistency score (0.987). The coverage of this combination was also high (0.896).

Perceptions that the entrepreneurs had done a good job, the perceived recognition of mistakes by the entrepreneurs, and the perceived active contribution of ideas and knowledge to the project were also necessary conditions, with consistency scores of 0.932, 0.933 and 0.930, respectively. Their coverage was also high (0.904, 0.894 and 0.916, respectively). The perceived failure of the product or service was not considered necessary because its consistency score (0.301) was less than 0.9. Understandably, the absence of perceived failure (i.e. ~FAIL) had a high consistency score of 0.715. This result was to be expected because the condition FAIL referred to the degree of failure of the product or service.

These results confirm that an indirect social effect of knowledge in reward-based crowdfunding requires investors’ comments on the crowdfunding project to be useful and for investors to perceive that their contribution represents an opportunity to share resources and help others. Investors also need to comment on mistakes by the entrepreneurs and acknowledge work that the entrepreneurs have done well, cooperating actively through suggestions and recommendations.

Therefore, these results confirm research propositions 1 and 2. Investors provide ideas and comments that entrepreneurs perceive as useful (research proposition 1). Furthermore, for this knowledge to affect society, investors must perceive the investment as effective at favouring different segments of the population (research proposition 2).

[Table 2 near here]

#### **4.2. *Analysis of sufficient conditions***

Sufficient conditions lead to the outcome, whereas necessary conditions must be present for the outcome to occur (Ragin, 2014). Ragin (2008) and Woodside's (2012) solution coverage criterion of 0.8 was used. The frequency threshold of 1 for success was used. The solution consistency was 0.948, and the solution coverage was 0.57. These values may be deemed acceptable according to the literature (Ragin, 2008; Woodside, 2012). Table 3 shows the combinations (configurations) of conditions that lead to success according to the parsimonious and intermediate solutions given by the fsQCA software. The most important solution suggests that knowledge has an indirect effect on society when investors actively contribute useful ideas and comments and acknowledge mistakes and good work by entrepreneurs. There should be no perceived failure: The project should be perceived as successful.

[Table 3 near here]

### **5. Conclusions**

Knowledge spillovers to society through reward-based crowdfunding require the dissemination of knowledge by investors. Through their experience and perceptions of the projects presented on reward-based crowdfunding platforms, investors contribute ideas, comments and suggestions to improve the products and services developed by entrepreneurs.



Through two-way online communication, project creators and the crowd exchange distinct points of view about these projects. If the financial target of the crowdfunding campaign is achieved, the entrepreneurs can implement these comments (Dezi, Leone, Schiavone, & Simoni, 2019). Although CF is a relatively new phenomenon, it has experienced a technical development that lead to a new era of Crowdfunding 2.0. in which the entrepreneur raise financing and also acquire knowledge, helping the entrepreneur to develop the project.

This exchange of ideas strengthens crowdfunding projects. Thus, crowdfunding investors improve projects in two ways: by making a financial investment and by providing tacit knowledge. When projects reach the market, society wins. For this knowledge to benefit society, investors must actively contribute ideas and knowledge. Their comments should also be relevant and constructive. Investors should perceive their financial and time investment as an opportunity to share economic and intellectual resources. Initially, this investment helps entrepreneurs directly, but it also has knock-on effects on citizens' well-being. The latter idea may be related to investors' intrinsic motivation in favour of individuals' social responsibility to support society.

This article considers the barriers or filters to knowledge. Based on the knowledge spillover theory of entrepreneurship, the creation of companies to commercialise knowledge is proposed because ideas are embodied in newly created firms (Qian, 2018). Knowledge creation has positive consequences for the economy as well as social benefits (Roper, Vahter, & Love, 2013). Crowdfunding is considered as an innovative way of using the Internet to bring together supply and demand in the realm of finance. However, crowdfunding is also an innovative process that generates knowledge, producing economic growth, employment and learning (Block, Thurik, & Zhou, 2013).

According to Albert Einstein, "intellectual growth should commence at birth and cease only at death". Fortunately, new business models and digitalisation make knowledge

acquisition possible and reduce the barriers to this knowledge. Crowdfunding is a tool to democratise finance (Chen, 2018; Kim & Hann, 2019; Stevenson, Kuratko & Eutsler, 2019). However, it can also democratise knowledge for investors and entrepreneurs, which then results in knowledge to benefit society.

Future research could examine the training that entrepreneurs receive through the platforms that act as intermediaries between investors and project creators. The utility of investors' suggestions could also be considered. Another potential line of research is the question of whether this generation of knowledge is bidirectional. Thus, it would be of interest to study whether there is feedback in this networking and whether investors also learn from the experience of investing in these crowdfunding projects. In addition, the theory has traditionally focused on the relationship between knowledge spillovers, geographical proximity and the formation of clusters. This article proposes a different view given that, through digitalisation, crowdfunding can eliminate geographical barriers to knowledge spillovers and cluster formation. It would be of interest to empirically analyse whether digitalisation enables the creation of online clusters and whether the creation of these clusters results in the indirect effect of knowledge.

## References

- Acs, Z. J., Audretsch, D. B., Braunerhjelm, P., & Carlsson, B. (2012). Growth and entrepreneurship. *Small Business Economics*, *39*(2), 289-300.
- Acs, Z. J., Audretsch, D. B., & Lehmann, E. E. (2013). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, *41*(4), 757-774.
- Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, *32*(1), 15-30.
- Ahlers, G. K., Cumming, D., Günther, C., & Schweizer, D. (2015). Signaling in equity crowdfunding. *Entrepreneurship Theory and Practice*, *39*(4), 955-980.
- Ahmad, F., & Widén, G. (2018). Knowledge sharing and language diversity in organisations: influence of code switching and convergence. *European Journal of International Management*, *12*(4), 351-373.
- Ahmad, N. H., Halim, H. A., Ramayah, T., Popa, S., & Papa, A. (2018). The ecosystem of entrepreneurial university: the case of higher education in a developing country. *International Journal of Technology Management*, *78*(1-2), 52-69.
- Angerer, M., Brem, A., Kraus, S., & Peter, A. (2017). Start-up funding via equity crowdfunding in Germany: A qualitative analysis of success factors. *The Journal of Entrepreneurial Finance (JEF)*, *19*(1), 1-34.
- Angerer, M., Niemand, T., Kraus, S., & Thies, F. (2018). Risk-reducing options in crowdfunding: An experimental study. *Journal of Small Business Strategy*, *28*(3), 1–17.
- Arena, M., Bengo, I., Calderini, M., & Chiodo, V. (2018). Unlocking finance for social tech start-ups: Is there a new opportunity space? *Technological Forecasting and Social Change*, *127*, 154-165.

- Audretsch, D. B. (2007). *The entrepreneurial society*. Oxford University Press.
- Audretsch, D. B., & Lehmann, E. E. (2005). Does the knowledge spillover theory of entrepreneurship hold for regions? *Research Policy*, *34*(8), 1191-1202.
- Autio, E., Nambisan, S., Thomas, L. D., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, *12*(1), 72-95.
- Belitski, M., & Desai, S. (2016). What drives ICT clustering in European cities? *The Journal of Technology Transfer*, *41*(3), 430-450.
- Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, *29*(5), 585-609.
- Belleflamme, P., Omrani, N., & Peitz, M. (2015). The economics of crowdfunding platforms. *Information Economics and Policy*, *33*, 11-28.
- Bi, S., Liu, Z., & Usman, K. (2017). The influence of online information on investing decisions of reward-based crowdfunding. *Journal of Business Research*, *71*, 10-18.
- Block, J. H., Thurik, R., & Zhou, H. (2013). What turns knowledge into innovative products? The role of entrepreneurship and knowledge spillovers. *Journal of Evolutionary Economics*, *23*(4), 693-718.
- Bloom, N., Schankerman, M., & Van Reenen, J. (2013). Identifying technology spillovers and product market rivalry. *Econometrica*, *81*(4), 1347-1393.
- Bocquet, R., & Mothe, C. (2010). Knowledge governance within clusters: the case of small firms. *Knowledge Management Research & Practice*, *8*(3), 229-239.
- Bonini, S., & Capizzi, V. (2019). The role of venture capital in the emerging entrepreneurial finance ecosystem: future threats and opportunities. *Venture Capital*, *21*(2-3), 137-175.

- Bönte, W. (2008). Inter-firm trust in buyer–supplier relations: Are knowledge spillovers and geographical proximity relevant? *Journal of Economic Behavior & Organization*, 67(3-4), 855-870.
- Boutillier, S., D. Carré, and N. Levratto, (2016). *Entrepreneurial Ecosystems*. Hoboken, NJ: John Wiley & Sons.
- Braunerhjelm, P., Acs, Z. J., Audretsch, D. B., & Carlsson, B. (2010). The missing link: knowledge diffusion and entrepreneurship in endogenous growth. *Small Business Economics*, 34(2), 105-125.
- Buesa, M., Heijs, J., & Baumert, T. (2010). The determinants of regional innovation in Europe: A combined factorial and regression knowledge production function approach. *Research Policy*, 39(6), 722-735.
- Chen, Y. (2018). Blockchain tokens and the potential democratization of entrepreneurship and innovation. *Business Horizons*, 61(4), 567-575.
- Chen, Y., Dai, R., Yao, J., & Li, Y. (2019). Donate Time or Money? The Determinants of Donation Intention in Online Crowdfunding. *Sustainability*, 11(16), 4269.
- Cillo, V., Rialti, R., Bertoldi, B., & Ciampi, F. (2019). Knowledge management and open innovation in agri-food crowdfunding. *British Food Journal*, 121(2), 242-258.
- Clauss, T., Breitenecker, R. J., Kraus, S., Brem, A., & Richter, C. (2018). Directing the wisdom of the crowd: the importance of social interaction among founders and the crowd during crowdfunding campaigns. *Economics of Innovation and New Technology*, 27(8), 731–751. <https://doi.org/10.1080/10438599.2018.1396660>
- Clayton, P., Feldman, M., & Lowe, N. (2018). Behind the scenes: Intermediary organizations that facilitate science commercialization through entrepreneurship. *Academy of Management Perspectives*, 32(1), 104-124.

- Damian, D., & Manea, C. (2019). Causal recipes for turning fin-tech freelancers into smart entrepreneurs. *Journal of Innovation & Knowledge*, 4(3), 196-201.
- De Luca, V. V., Margherita, A., & Passiante, G. (2019). Crowdfunding: a systemic framework of benefits. *International Journal of Entrepreneurial Behavior & Research*.
- Dejean, S. (2019). The role of distance and social networks in the geography of crowdfunding: evidence from France. *Regional Studies*. DOI: 10.1080/00343404.2019.1619924
- Dezi, L., Leone, D., Schiavone, F., & Simoni, M. (2019). The knowledge management of micro-firms in the crowd: key challenges for successful operations. *Production Planning & Control*, 30(10-12), 1005-1018.
- Dhanaraj, C., & Parkhe, A. (2006). Orchestrating innovation networks. *Academy of management review*, 31(3), 659-669.
- Döring, T., & Schnellenbach, J. (2006). What do we know about geographical knowledge spillovers and regional growth?: A survey of the literature. *Regional Studies*, 40(03), 375-395.
- Evans, G. L. (2019). Emergence of a digital cluster in east London: birth of a new hybrid firm. *Competitiveness Review: An International Business Journal*, 29(3), 253-266.
- Felício, J. A., Rodrigues, R., Grove, H., & Greiner, A. (2018). The influence of corporate governance on bank risk during a financial crisis. *Economic Research-Ekonomska Istraživanja*, 31(1), 1078-1090.
- Fernández-Vázquez, J. S., & Álvarez-Delgado, R. C. (2019). Persuasive strategies in the SME entrepreneurial pitch: Functional and discursive considerations. *Economic Research-Ekonomska Istraživanja*. DOI: 10.1080/1331677X.2019.1683462

- Ferreira, J. J. M., Fernandes, C. I., & Kraus, S. (2019). Entrepreneurship research: mapping intellectual structures and research trends. *Review of Managerial Science*, 13(1), 181–205. <https://doi.org/10.1007/s11846-017-0242-3>
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54(2), 393-420.
- Fritsch, M. (2002). Measuring the quality of regional innovation systems: A knowledge production function approach. *International Regional Science Review*, 25(1), 86-101.
- Gallié, E. P. (2009). Is geographical proximity necessary for knowledge spillovers within a cooperative technological network? The case of the French biotechnology sector. *Regional Studies*, 43(1), 33-42.
- Gast, J., Werner, A., & Kraus, S. (2017). Antecedents of the small firm effect: the role of knowledge spillover and blocked mobility for employee entrepreneurial intentions. *International Entrepreneurship and Management Journal*, 13(1), 277–297. <https://doi.org/10.1007/s11365-016-0403-x>
- Gera, J., & Kaur, H. (2018). Investigation of Parameters Influencing the Success of Crowdfunded Campaigns. In G. C. Deka, O. Kaiwartya, P. Vashisth, & P. Rathee (Eds.), *Applications of Computing and Communication Technologies*. ICACCT 2018. Communications in Computer and Information Science, vol 899 (pp. 275–285). Singapore: Springer Singapore.
- Ghio, N., Guerini, M., Lehmann, E. E., & Rossi-Lamastra, C. (2015). The emergence of the knowledge spillover theory of entrepreneurship. *Small Business Economics*, 44(1), 1-18.

- Gimeno, J., Folta, T. B., Cooper, A. C., & Woo, C. Y. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly*, 750-783.
- Giuliani, E. (2007). Towards an understanding of knowledge spillovers in industrial clusters. *Applied Economics Letters*, 14(2), 87-90.
- Giusti, J. D., Alberti, F. G., & Belfanti, F. (2018). Makers and clusters. Knowledge leaks in open innovation networks. *Journal of Innovation & Knowledge*. DOI: 10.1016/j.jik.2018.04.001
- Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, 35(1), 220-265.
- González-Moreno, Á., Díaz-García, C., & Sáez-Martínez, F. J. (2018). R&D team composition and product innovation: gender diversity makes a difference. *European Journal of International Management*, 12(4), 423-446.
- Griliches, Z. (1979). Issues in assessing the contribution of research and development to productivity growth. *Bell Journal of Economics*, 10(1), 92-116.
- Grossman, G. M., & Helpman, E. (1994). Endogenous innovation in the theory of growth. *Journal of Economic Perspectives*, 8(1), 23-44.
- Guo-Fitoussi, L., Bounfour, A., & Rekik, S. (2019). Intellectual property rights, complementarity and the firm's economic performance. *International Journal of Intellectual Property Management*, 9(2), 136-165.
- Gupta, A. K., Tesluk, P. E., & Taylor, M. S. (2007). Innovation at and across multiple levels of analysis. *Organization Science*, 18(6), 885-897.



- Gupta, G., & Bose, I. (2019). Strategic learning for digital market pioneering: Examining the transformation of Wishberry's crowdfunding model. *Technological Forecasting and Social Change*, *146*, 865-876.
- Ha, J., & Howitt, P. (2007). Accounting for Trends in Productivity and R&D: a Schumpeterian critique of semi-endogenous growth theory. *Journal of Money, Credit and Banking*, *39*(4), 733-774.
- He, Q., Guaita-Martínez, J. M., & Botella-Carrubi, D. (2019). How brand equity affects firm productivity: The role of R&D and human capital. *Economic Research-Ekonomska Istraživanja*. DOI: 10.1080/1331677X.2019.1686045
- Hornuf, L., & Schwienbacher, A. (2018). Market mechanisms and funding dynamics in equity crowdfunding. *Journal of Corporate Finance*, *50*, 556-574.
- Isenberg, D. J. (2010). The big idea: How to start an entrepreneurial revolution. *Harvard Business Review*, *88*(6), 40-50.
- Jaffe, A. B. (1986). Technological opportunity and spillovers of R&D: evidence from firms' patents, profits and market value.
- Jaffe, A. B. (1989). Real effects of academic research. *American Economic Review*, *79*(5), 957-970.
- Jarchow, S., & Röhm, A. (2019). Patent-based investment funds: From invention to innovation. *The Journal of Technology Transfer*, *44*(2), 404-433.
- Jerome, L. W. (2013). Innovation in social networks: Knowledge spillover is not enough. *Knowledge Management Research & Practice*, *11*(4), 422-431.
- Johansson, B., Karlsson, C., & Stough, R. R. (2006). Entrepreneurship, Clusters and Policy in the Emerging Digital Economy. In B. Johansson, C. Karlsson, & R. Stough (Eds.),

*The Emerging Digital Economy – Entrepreneurship, Clusters and Policy* (pp. 1-19).  
Springer, Berlin, Heidelberg.

- Kang, L., Jiang, Q., & Tan, C. H. (2017). Remarkable advocates: An investigation of geographic distance and social capital for crowdfunding. *Information & Management*, 54(3), 336-348.
- Kim, H., & Kim, J. (2017). Geographic proximity between lender and borrower: how does it affect crowdfunding? *Review of Accounting and Finance*, 16(4), 462-477.
- Kim, K., & Hann, I. H. (2019). Crowdfunding and the Democratization of Access to Capital—An Illusion? Evidence from Housing Prices. *Information Systems Research*, 30(1), 276-290.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3(3), 383-397.
- Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., & Spitzer, J. (2019). Digital entrepreneurship: A research agenda on new business models for the twenty-first century. *International Journal of Entrepreneurial Behaviour and Research*, 25(2), 353–375. <https://doi.org/10.1108/IJEER-06-2018-0425>
- Kraus, S., Ribeiro-Soriano, D., & Schüssler, M. (2018). Fuzzy-set qualitative comparative analysis (fsQCA) in entrepreneurship and innovation research—the rise of a method. *International Entrepreneurship and Management Journal*, 14(1), 15-33.
- Kraus, S., Richter, C., Brem, A., Cheng, C. F., & Chang, M. L. (2016). Strategies for reward-based crowdfunding campaigns. *Journal of Innovation & Knowledge*, 1(1), 13-23.
- Kraus, S., Roig-Tierno, N., & Bouncken, R. B. (2019). Digital innovation and venturing: an introduction into the digitalization of entrepreneurship. *Review of Managerial Science*, 13(3), 519–528. <https://doi.org/10.1007/s11846-019-00333-8>

- Krueger Jr, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5-6), 411-432.
- Lehmann, E. E., & Menter, M. (2018). Public cluster policy and performance. *The Journal of Technology Transfer*, 43(3), 558-592.
- Liguori, E., Bendickson, J., Solomon, S., & McDowell, W. C. (2019). Development of a multi-dimensional measure for assessing entrepreneurial ecosystems. *Entrepreneurship and Regional Development*, 31(1-2), 7-21. <https://doi.org/10.1080/08985626.2018.1537144>
- Lin, M., Prabhala, N. R., & Viswanathan, S. (2013). Judging borrowers by the company they keep: Friendship networks and information asymmetry in online peer-to-peer lending. *Management Science*, 59(1), 17-35.
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1), 135-172.
- Madsen, J. B. (2008). Semi-endogenous versus Schumpeterian growth models: testing the knowledge production function using international data. *Journal of Economic Growth*, 13(1), 1-26.
- Marshall, A. (1890). *Principles of economics*, Vol. 1. London, UK: Macmillan.
- Martin, R., & Sunley, P. (1998). Slow convergence? The new endogenous growth theory and regional development. *Economic Geography*, 74(3), 201-227.
- Maznevski, M. L., & Chudoba, K. M. (2000). Bridging space over time: Global virtual team dynamics and effectiveness. *Organization Science*, 11(5), 473-492.
- Mendel, J. M., & Korjani, M. M. (2013). Theoretical aspects of fuzzy set qualitative comparative analysis (fsQCA). *Information Sciences*, 237, 137-161.
- Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29(1), 1-16.

- Mollick, E., & Nanda, R. (2015). Wisdom or madness? Comparing crowds with expert evaluation in funding the arts. *Management Science*, 62(6), 1533-1553.
- Niemand, T., Angerer, M., Thies, F., Kraus, S., & Hebenstreit, R. (2018). Equity crowdfunding across borders: a conjoint experiment. *International Journal of Entrepreneurial Behavior & Research*, 24(4), 911-932.
- Nieto-Aleman, P. A., Garcia-Alvarez-Coque, J. M., Roig-Tierno, N., & Mas-Verdú, F. (2019). Factors of regional poverty reduction in Colombia: Do institutional conditions matter? *Social Policy & Administration*, 53(7), 1045-1063. DOI: 10.1111/spol.12474
- Nucciarelli, A., Li, F., Fernandes, K. J., Goumagias, N., Cabras, I., Devlin, S., ... & Cowling, P. (2017). From value chains to technological platforms: The effects of crowdfunding in the digital game industry. *Journal of Business Research*, 78, 341-352.
- Öberg, C., & Alexander, A. T. (2019). The openness of open innovation in ecosystems—integrating innovation and management literature on knowledge linkages. *Journal of Innovation & Knowledge*, 4(4), 211-218.
- Ogawa, K., Sterken, E., & Tokutsu, I. (2019). International spillovers of R&D and marginal social returns. *Review of International Economics*, 27, 936-954.
- Ordanini, A., Miceli, L., Pizzetti, M., & Parasuraman, A. (2011). Crowd-funding: transforming customers into investors through innovative service platforms. *Journal of Service Management*, 22(4), 443-470.
- Pack, H. (1994). Endogenous growth theory: intellectual appeal and empirical shortcomings. *Journal of Economic Perspectives*, 8(1), 55-72.
- Pietrucha, J., & Żelazny, R. (2019). TFP spillover effects via trade and FDI channels. *Economic Research-Ekonomska Istraživanja*. DOI: 10.1080/1331677X.2019.1629327

- Ponds, R., Oort, F. V., & Frenken, K. (2009). Innovation, spillovers and university–industry collaboration: an extended knowledge production function approach. *Journal of Economic Geography*, 10(2), 231-255.
- Powell, W. W. (1990). Neither market nor hierarchy: Network forms of organization. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior*, Vol. 12, 295–336. Greenwich, CT: JAI Press.
- Qian, H. (2018). Knowledge-based regional economic development: A synthetic review of knowledge spillovers, entrepreneurship, and entrepreneurial ecosystems. *Economic Development Quarterly*, 32(2), 163-176.
- Ragin, C. (2008). *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. Chicago, IL: University of Chicago Press.
- Ragin, C. C. (2014). *The comparative method: Moving beyond qualitative and quantitative strategies*. Berkeley, CA: University of California Press.
- Rippa, P., & Secundo, G. (2019). Digital academic entrepreneurship: The potential of digital technologies on academic entrepreneurship. *Technological Forecasting and Social Change*, 146, 900-911.
- Roig-Tierno, N., Gonzalez-Cruz, T. F., & Llopis-Martinez, J. (2017). An overview of qualitative comparative analysis: A bibliometric analysis. *Journal of Innovation & Knowledge*, 2(1), 15-23.
- Roma, P., Petruzzelli, A. M., & Perrone, G. (2017). From the crowd to the market: The role of reward-based crowdfunding performance in attracting professional investors. *Research Policy*, 46(9), 1606-1628.
- Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2), S71-S102.

- Roper, S., Vahter, P., & Love, J. H. (2013). Externalities of openness in innovation. *Research Policy*, 42(9), 1544-1554.
- Ryan, J. C., & Berbegal-Mirabent, J. (2016). Motivational recipes and research performance: A fuzzy set analysis of the motivational profile of high performing research scientists. *Journal of Business Research*, 69(11), 5299-5304.
- Ryu, S., & Kim, Y. G. (2016). A typology of crowdfunding sponsors: Birds of a feather flock together? *Electronic Commerce Research and Applications*, 16, 43-54.
- Schneider, C. Q., & Wagemann, C. (2012). *Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis*. Cambridge, UK: Cambridge University Press.
- Solow, R. M. (1957). Technical change and the aggregate production function. *The Review of Economics and Statistics*, 312-320.
- Stanko, M. A., & Henard, D. H. (2017). Toward a better understanding of crowdfunding, openness and the consequences for innovation. *Research Policy*, 46(4), 784-798.
- Steigenberger, N. (2017). Why supporters contribute to reward-based crowdfunding. *International Journal of Entrepreneurial Behavior & Research*, 23(2), 336-353.
- Stevenson, R. M., Kuratko, D. F., & Eutsler, J. (2019). Unleashing main street entrepreneurship: Crowdfunding, venture capital, and the democratization of new venture investments. *Small Business Economics*, 52(2), 375-393.
- Streb, J., Baten, J., & Yin, S. (2006). Technological and geographical knowledge spillover in the German empire 1877–1918. *The Economic History Review*, 59(2), 347-373.
- Testa, S., Nielsen, K. R., Bogers, M., & Cincotti, S. (2019). The role of crowdfunding in moving towards a sustainable society. *Technological Forecasting and Social Change*, 141, 66-73.

- Vismara, S. (2019). Sustainability in equity crowdfunding. *Technological Forecasting and Social Change*, 141, 98-106.
- Woodside, A. G. (2012). Incompetency training: Theory, practice, and remedies. *Journal of Business Research*, 65(3), 279–293.
- Woodside, A. G. (2014). Embrace• perform• model: Complexity theory, contrarian case analysis, and multiple realities. *Journal of Business Research*, 67(12), 2495-2503.
- Woodside, A. G., Prentice, C., & Larsen, A. (2015). Revisiting problem gamblers' harsh gaze on casino services: Applying complexity theory to identify exceptional customers. *Psychology & Marketing*, 32(1), 65-77.
- Xu, X., Wang, Z., Zhou, B., & Zhang, Z. (2019). The empirical analysis of knowledge spillover effect measurement. *Knowledge Management Research & Practice*, 17(1), 83-95.
- Yoo, Y., Boland Jr., R. J., Lyytinen, K., & Majchrzak, A. (2012). Organizing for innovation in the digitized world. *Organization Science*, 23(5), 1398-1408.
- Zhang, J., & Liu, P. (2012). Rational herding in microloan markets. *Management Science*, 58(5), 892-912.

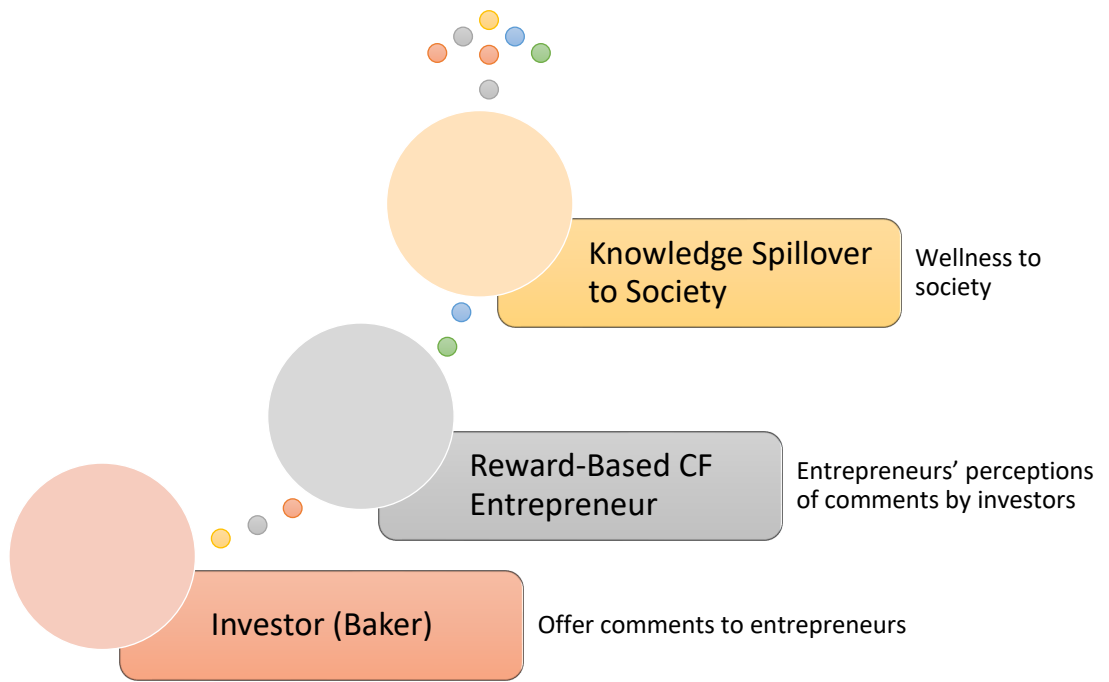


Figure 1. Model



Table 1. Description and codification of outcome and conditions

Type	Name	Description	Codification
Outcome	Wellness	The degree of contribution of resource-based crowdfunding campaigns to society	Fuzzy value
Condition	USEF	The utility of investors' comments on the crowdfunding project	Fuzzy value
Condition	GJOB	The extent to which investors acknowledge work well done by the entrepreneurs	Fuzzy value
Condition	ERROR	The extent to which investors acknowledge the errors of the entrepreneurs	Fuzzy value
Condition	ACT	Investors' active contribution to crowdfunding projects in the form of knowledge and ideas	Fuzzy value
Condition	OPPORT	The perceptions of investors regarding whether their contribution represents an opportunity to share resources and help others	Fuzzy value
Condition	FAIL	The degree to which the product or service fails	Fuzzy value

Table 2. Analysis of necessary conditions

	<b>PRESENCE</b>	
	Cons.Nec	Cov.Nec
<b>USEF+OPPOR</b>	0.987	0.896
<b>GJOB</b>	0.932	0.904
<b>~GJOB</b>	0.107	0.917
<b>ERROR</b>	0.933	0.894
<b>~ERROR</b>	0.094	0.906
<b>ACT</b>	0.930	0.916
<b>~ACT</b>	0.113	0.853
<b>FAIL</b>	0.301	0.962
<b>~FAIL</b>	0.715	0.857

Note: Cons.Nec = consistency; Cov.Nec = coverage.

Table 3. Analysis of sufficient conditions for the outcome *wellness in society*

Condition	Configuration 1
USEF	●
GJOB	●
ERROR	●
ACT	●
OPPOR	●
FAIL	○
Raw coverage	0.570
Unique coverage	0.570
Consistency	0.948
Solution coverage	0.570
Solution consistency	0.948

*Notes:* Black circles indicate the presence of the condition; White circles indicate the absence of the condition; Large circles indicate core conditions (i.e. conditions that appear in both the parsimonious solution and the intermediate solution); Small circles indicate peripheral conditions (i.e. conditions that appear in the intermediate solution but not in the parsimonious solution); Blank spaces indicate conditions that may be present or absent (i.e. not relevant).