

## **Equity crowdfunding and Web 2.0: a social network analysis**

**Purpose** – The purpose of this paper is to investigate the role that crowdfunding platforms, and specifically equity-based ones, have on social media, with particular regard to Twitter. Specifically, the study explores some aspects related to the diffusion of news through social networks concerning the crowdfunding tool and specifically of equity ones.

**Design/methodology/approach** – This paper follows an exploratory quantitative research approach based on social network analysis (SNA) methodology.

**Findings** – The results indicate higher number of tweets and users has spoken about equity crowdfunding in relation to the introduction of the last Consob regulation on equity crowdfunding at the beginning of 2018 and the growth of the use of this instrument in the first quarter of 2019. Moreover, we find that the operators of the sector, with particular regard to crowdfunding platforms are central in the network, followed by traditional and specialized media.

**Originality/value** – To the authors' knowledge this is the first research that jointly investigate equity crowdfunding model and web 2.0 in the Italian market. In particular, this study contributes to the literature on equity crowdfunding by clarifying some aspects related to the diffusion of news through social networks (Twitter).

**Paper type** – Research Paper

**Keywords:** Crowdfunding, Equity Crowdfunding, Social Media, Social Network Analysis, Web 2.0, Twitter.

## 1. Introduction

Starting in 2010, crowdfunding has emerged as an innovative method for financing new ventures by allowing individual founders of for-profit, social or cultural projects to request funding from multiple people (Mollick, 2014) rather than raising large amounts from a limited number of large investors and/or backers (Belleflamme et al., 2014). This usually happens without the contribution of common financial intermediaries (Rodriguez-Ricardo et al., 2018), but through the use of the internet (Mollick, 2014). In particular, crowdfunding is a collaborative process of a group of people who use their money, in common, to support the efforts of organizations and people (Paoloni et al., 2019).

Taking inspiration from the principles of crowdsourcing (Kleemann et al., 2008) and micro-finance (Morduch, 1999), crowdfunding can be defined as a community-based funding method (Agrawal et al., 2015). Indeed, crowdfunding incorporates advantages that go beyond the funding collected, including feedback on ideas under development project validation (Frydrych et al., 2014) and interaction between different stakeholders (Mollick and Kuppuswamy, 2014).

There are currently five standard models of crowdfunding (e.g. Quaranta, 2017): donation based, equity based, reward based, royalty based and lending based. Briefly, equity involves the purchase of an investor share in the company; lending consists of a loan from individuals or institutional intermediaries that will be repaid with interest in a pre-established period of time; reward implies a non-monetary reward, such as a product or service based on the amount invested in the financial campaign; royalty implies a monetary reward in terms of shares of the project's future earnings; and donation implies a monetary transfer to finance projects with social implications.

In general terms, the crowdfunding market has developed at triple digital rates in recent years (Barbi and Bigelli, 2017) and research interest in crowdfunding has been steadily increasing even if they are still limited (Short et al., 2017). Specifically, equity-based venture financing through an online crowd has had fast development (Morits et al., 2015) and some studies have focused on different aspects connected to this type of financing source. With reference to the general topic of mass media, Beier and Wagner (2015) apply the perspective of social media on crowdfunding; Cecere et al. (2017) investigate the crowdfunding and the social influence; Verschoore and Zuquetto (2016) propose a framework based on social network analysis for crowdfunding project and Nevin et al. (2017) use a Social Identity Theory to examine equity crowdfunding. However, to our knowledge, no studies have jointly investigated the equity based model and social media in the Italian market. Using a *Social Network Analysis* (SNA) methodology, this paper therefore seeks to gather evidence about the nature and features of the equity crowdfunding model in Italy, with special reference to social network. Therefore, the purpose of this paper is to investigate the role that crowdfunding platforms, and specifically equity-based ones, have on social media, with particular regard to Twitter. In particular, the study explores some aspects related to the diffusion of news through social networks concerning the crowdfunding tool and specifically of equity ones.

This study contributes to the literature on equity crowdfunding by clarifying some aspects related to the diffusion of news through social networks (Twitter). In particular, the contribution of this research is manifold. First, we have extended the debate on crowdfunding and equity-based one. Second, we have linked the topic of equity crowdfunding to social media. Third, we have highlighted how equity-based platforms

have an influence in social networks, also in comparison with general crowdfunding area.

The remainder of this paper is organized as follows. The first part includes a theoretical backbone and hypothesis about crowdfunding in general and, specifically, on type equity-based and, finally, on social media. In the second part, the methodology and sample adopted in this study are explained, followed by the discussion of results. The last part includes the conclusions, implications and future line of research.

## **2. Theoretical backbone and hypothesis development**

### *Fundamental principles of crowdfunding*

As previously introduced, crowdfunding is a new financial and social phenomenon all over the world (Prevati et al., 2014) and, specifically, it represents a rapidly diffusing practice in the area of entrepreneurial finance (Giudici et al., 2014). Since the first platform emerged, crowdfunding has become a new way to raise money from new ventures and from the scientific point of view, the treatment of the crowdfunding phenomenon is developing in many areas of research, e.g. business, management, accounting, economics, econometrics and finance (Paoloni et al., 2019). However, despite this growing popularity, academic understanding of the phenomenon is quite limited (Colombo et al., 2015) and the concept of crowdfunding is in a state of evolution that makes definitions still arbitrarily limited (e.g. De Buysere et al., 2012; European Council, 2014; Pais et al., 2014; Quaranta, 2017; Tencalla, 2017). The European Crowdfunding Network (2012) defines it as follows: “crowdfunding is a collective effort of many individuals who network and pool their resources to support efforts initiated by other people or organizations”. Pais et al. (2014) define it as “a form of participation (financial, but not only) of the (social) network and through the network (Internet) to a project that is characterized by: forward planning; freedom of choice of the project and of the designer, conveyed through reputational mechanisms; transparency of the funds collected”. Quaranta (2017) narrows the term crowdfunding to “a particular type of collective funding that, exploiting the potential of the Internet, allows those who have ideas or needs, but – respectively – not all the funds to realize or satisfy them, to try to access third-party financial resources, starting from those of relatives and friends (family and friends) in the hope of attracting those – much larger – of the crowd (crowd) that populates the online world, which, trusting the feedback mechanisms which are generated among users is willing to finance an increasing number of ideas (needs), as the tendency is to sell more and more units of products and/or services specific to small niches. In this way, anyone can potentially access a real ‘crowd funding’”. For Tencalla (2017) “Crowdfunding can be defined as the process by which more people give money to finance a project using websites and sometimes receive a reward in return”. Finally, the European Commission (2018) highlights that “The basic function of crowdfunding can be described as an open call via the Internet for the provision of funds by the public at large to support specific initiatives by typically small fundraisers. The investors/lenders can provide the means as a pure donation (intangible reward) or in exchange for some form of reward in order to compensate for the financial risk taken (tangible reward)”.

Generally, a crowdfunding transaction involves three main actors (Renwick and Mossialos, 2017): the project initiators-owners-creators (who – individuals or investors – are seeking the funding), the funders (who – individuals – are offering the financial

sources), and the platform providers (who are connecting the project initiator with funders by an online forum and play a role as organizational coordinator).

Five standard funding models typically characterize crowdfunding (e.g., Poetz and Schreier, 2012; Belleflamme et al., 2013; Agrawal et al., 2015; Scott, 2015; Piattelli, 2013; Pais et al., 2014; Rossi, 2014; Quaranta, 2017): donation-based crowdfunding, equity-based crowdfunding, reward-based crowdfunding, royalty-based crowdfunding, and lending-based crowdfunding. These types of crowdfunding can also be called, simply, donation, equity, reward, royalty, and lending. In general, equity-based, reward-based, and social lending models are more compliant with business activity, while donation-based lends itself more to non-profit organizations. As for the private sector, however, they are not allowed to resort to equity crowdfunding except through a company; on the other hand, reward-based projects (especially in the pre-selling mode) and peer-to-peer loans are very widespread at the international level.

#### *Equity-based crowdfunding and regulation framework*

Equity-based crowdfunding has become an important option for early-stage financing of unlisted companies; it concerns raising money from small public investors principally through social media and online forums.

Equity-based campaigns are used to launch a start-up or to provide capital for a new business venture for an existing firm. In exchange for comparatively small amounts of money, investors acquire a proportionate share of equity in a business venture. In this sense, Bradford (2012) defines equity crowdfunding as a “model in which funders receive an interest in the form of equity or equity-like arrangements (e.g., profit sharing) in the ventures they fund”. Belleflamme et al. (2014) highlight that the main difference between traditional fund raising and this type of crowdfunding is the funding process itself. In the equity crowdfunding mechanism, entrepreneurs make an open call for funding on a crowdfunding platform, and investors make their choices based on the information provided therein (Ahlers et al., 2015). A shareholder has partial ownership of a company and obtains a profit should the firm do well, but if the company fails, investors can lose their investment.

This type of funding source is a crowdfunding model for firms that want to shape their future growth and their development in a community of investors, who feel they form part of the business idea and are willing to share their relationship network, their own capital, and its resources. The use of equity crowdfunding requires a series of evaluations for companies that choose this type of financing. In particular, it is important (De Luca, 2015) that the company:

- carefully define the terms of the transaction, clearly indicating the share of capital offered to the public and the relative price;
- identify what the costs of the transaction may be (they are usually linked to the commissions of the chosen platform, to the legal and administrative costs for the implementation of the campaign, and to any external consultancy for the operation);
- prepare a business plan and related financial projections;
- indicate the rights of investors, as, based on the investor's economic contribution, these may vary; it is important that the company carefully define the types of shares that it will offer to the public and the associated control participation it will retain for itself.

Italy was the first country to regulate equity crowdfunding through the Decree Law 179/2012 converted into law n. 221/2012. In particular, Consob (Commissione Nazionale per le Società e la Borsa; Italian Companies and Exchange Commission)

regulations define the scope of equity crowdfunding and establish the principles and methods of managing a portal and protecting the retail investor, who is different from the professional investor in being less expert in this type of investment path. Initially, in Italy the use of equity crowdfunding was reserved only for startups and innovative SMEs, only subsequently Consob with resolution 11/29/2017 n. 20204, modifying the previous Regulation on the collection of risk capital through online portals (Resolution n. 18592 of 06/26/2013 and resolution n. 19520 of 02/24/2016) extended the possibility to all SMEs that meet certain requirements to access the equity crowdfunding tool, further changes were then made by resolution n. 20264 of 01/17/2018.

Finally, with reference to the number of platforms actively in Italia, an April 2019, 32 equity crowdfunding platforms exist in Italy: 30 registered in the ordinary category and two platforms registered in the special category.

### *Social media and hypothesis*

The literature identifies different ways of disseminating financial information. A first traditional area is that of word of mouth. Bansal and Voyer (2000) and Bausch and Han (2006) have shown that investors rely heavily on the advice of family, friends and colleagues regarding their financial choices by marrying the traditional theory of communication that considers information to be disseminated through word of mouth is able to exert a high influence on the behavior of individuals (Cox, 1963; Brown and Reingen, 1987; Money et al., 1998; Mauri, 2011).

Then there is the field of mass media, for which we mean newspapers, television networks, radio channels and the web. Alongside the traditional paradigm of top-down information dissemination, a mechanism for active participation in the information process has spread through the use of Web 2.0 tools, represented, in particular, by RSS feeds and microblogging sites (Facebook, Google+, Twitter, etc.).

With a mechanism similar to word of mouth, these tools allow users to express and disseminate comments and opinions on any event. The term Web 2.0 used for the first time by Tim O'Reilly (2007), indicates a second generation of telematics services, which allows people to collaborate and share information on the net.

The web offers new channels of information dissemination, where social networks, blogs and microblogging can be considered places of interaction where information is not only disseminated but even originated.

To testify to the great importance that these networks are assuming for the dissemination of information, there is the fact that often they are also used by traditional media (Armstrong and Gao, 2010).

Several studies have focused on Twitter, one of the most important microblogging sites. One of the first quantitative research, based on data extrapolated from Twitter was carried out with the intention of relating the structure of the users' social network and their interactions based on message exchange (Huberman et al., 2009).

Subsequent studies focused on the underlying structure of the social network and the ability of users to influence (Cha et al., 2010; Carretta et al., 2013), the content of the messages (Huang and Thornton, 2010), the "mood" expressed by the messages (Pak and Paroubek, 2010; Bollen et al., 2011) and user demographics (Mislove et al., 2011). In particular, Carretta et al. (2013) use Twitter to track the flow of tweets converging around the hashtag #spread during the period 21-30 May 2012, finding that the influence of traditional media is still relevant but also that blogs (especially financial ones) they are becoming increasingly important in the dissemination of news on the social network. Graziano and Vicentini (2018) using a Social Network Analysis, highlight the central actors' role in spreading news on the Twitter platform from

November 2015 to March 2016, in relation to bail-in and recent events of banks in financial difficulty, such as the “Banca Etruria” case. The Authors find that central media propagation is represented by traditional media through the use of their official accounts in the case of #bancaetruria, while when it comes to bail-in, financial blogs take on a central position in the network.

Following this perspective, our research hypothesis is as follows:

*H1: Starting from the recent changes in Italian regulatory on equity crowdfunding, it is the operators of the sector, such as crowdfunding platforms, who have the greatest influence in social networks, being the topic of specialized nature.*

### 3. Methodology and sample

According to the logic of word of mouth, Twitter allows active participation by users, through the possibility of expressing and disseminating comments. For this reason, Twitter has over time become an interesting field of study of the methods of circulation of financial news. In this perspective, we want to investigate the relationship between the nature and the capacity to influence the various information sources, highlighting the actors who play a central role in the propagation of news on the topic of crowdfunding and equity crowdfunding.

The *Social Network Analysis* methodology is used to study the relationship between nature and influence capacity of information sources (Mitchell, 1969; Wasserman and Faust, 1994; Degenne and Forsé, 2007; Carretta et al., 2013; Signori and Confente, 2014; Lazzeretti and Capone, 2016).

This methodology makes it possible to distinguish the types of users who have published on some topics identified on the basis of hashtags and to detect the set of relations between the different users and the dissemination of a message within the social network.

The analysis of the nature of Twitter users makes it possible to distinguish users between mass media (traditional and blogs), sector operators (in the case of topic crowdfunding, crowdfunding platforms or financial intermediaries and/or institutions) and individuals.

The measurement of the centrality of one actor over another was measured with *betweenness*. Betweenness centrality is a way of detecting the amount of influence a node has over the flow of information in a graph. It is often used to find nodes that serve as a bridge from one part of a graph to another. Each node represents a user profile within the social network.

$$Betweenness (n_i) = \sum_{j < k} g_{jk}(n_i) / g_{jk}$$

The betweenness of the user  $i$  is given by the summation of all the partial betweenness calculated for each pair of vertices  $g_{jk}$ , where:

- $g_{jk}$  represents the number of geodetic links, that is shorter, between vertices  $j$  and  $k$ ;
- $g_{jk}(n_i)$  is the number of times the user  $i$  is involved.

The idea behind this measure is that the impact that a singular user is able to exert is linked to the number of times it is in the shortest path between two other actors. In other words, this measure is the expression of a user's ability to be an informative relational bridge.

The significance of the differences in the categories was then tested through the ANOVA statistical test.

The data is represented by all the tweets converging towards the hashtags #crowdfunding and #equitycrowdfunding.

Considering the update of the CONSOB regulation on equity crowdfunding that took place on 17th January 2018, the analysis period runs from 15th January 2018 to 30th April 2019.

According to the hashtag #equitycrowdfunding there are 86 users who produced 978 tweets and 613 retweets, while as regards the cases of the hashtag #crowdfunding 155 users produced 586 tweets and 324 retweets (Table 1). The analysis of the retweets is important because it allows to define the networks of interaction between different users and the strength of their relationships.

*Table 1. Twitter coverage in relation to the hashtags #equitycrowdfunding and #crowdfunding in the period 15th January 2018 - 30th April 2019*

Hashtag	Users	Tweet	Retweet
#equitycrowdfunding.	86	978	613
#crowdfunding	155	586	324

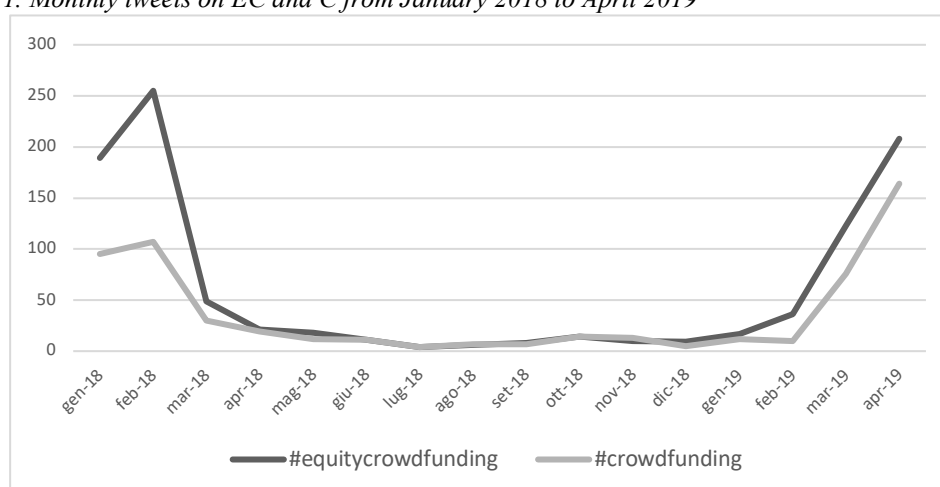
*Source: Authors' elaboration on Twitter data.*

The users who tweet about equity crowdfunding are less numerically than those who tweet using the hashtag #crowdfunding, but give greater coverage to the topic by producing more tweets and retweets that determine more lively networks and stronger relationships among users by virtue of their small number.

In the analyzed time horizon, the monthly distribution of the tweets convergent on the hashtags #crowdfunding and #equitycrowdfunding (Graph 1) show some peaks in relation to January and February of the 2018 year and March and April 2019. The value of these peaks in the 2018 are justified by the regulatory thrust due to the Consob regulation and its application and interpretation which contributed to igniting the debate on the matter.

The trend in the first months of 2019 year reflects the growth of the Italian equity crowdfunding market (Politecnico of Milan, 2019).

*Graph 1. Monthly tweets on EC and C from January 2018 to April 2019*



*Source: Authors' elaboration on Twitter data.*

Table 2 shows which hashtags recur more in tweets that converge on #equitycrowdfunding and #crowdfunding. Not surprisingly, the hashtags #startup and #innovation are the most popular, followed by #sustainability and #opportunity. The use of these hashtags in tweets shows how often this tool is associated with the phases of birth and start-up of innovative and sustainable companies and how this investment represents an opportunity.

In the “Other” category, we have grouped all the other hashtags that are not numerically significant if considered individually.

*Table 2. Most recurring hashtags in tweets on #equitycrowdfunding and #crowdfunding.*

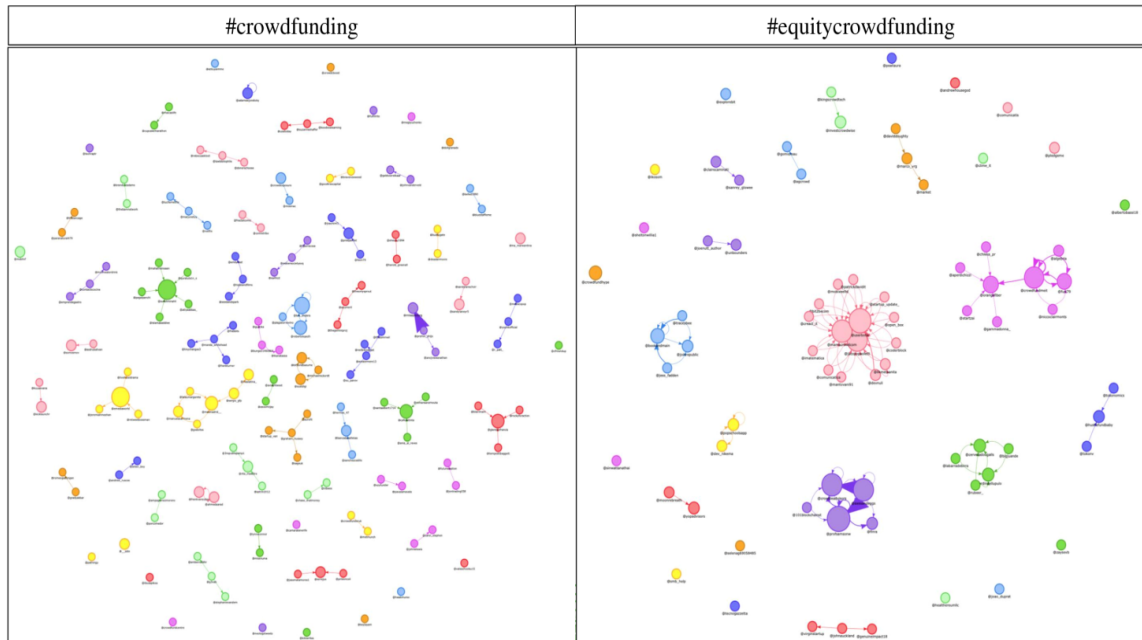
Hashtag	Number of Tweet
#startup	731
#innovation	423
#sustainability	105
#opportunity	97
Other	208
Total	1564

*Source: Authors' elaboration on Twitter data.*

#### 4. Results

Based on the analysis carried out, Figure 1 shows the interaction networks between the users trained on the basis of the retweets produced on the tweets containing the examined hashtags.

*Figure 1. Network generated by retweets containing the hashtags #crowdfunding and #equitycrowdfunding*



*Source: Authors' elaboration on Twitter data.*

The observation of the clouds generated by the selection of retweets based on the hashtags used for the research confirms first of all that the network related to #crowdfunding is composed by more users than the cloud of the hashtag



#equitycrowdfunding, but it is less concentrated. Referring to equity crowdfunding, the interactions between users are very intense although different networks are identified with fewer users exchanging tweets and retweets on the topic. This cloud highlights three network where the relations are stronger because there is more production and exchange of tweets

The configuration of the clouds is typical of the topics which, although not *hot topics*, are characterized by a propagation in the public led by experts in the subject, operators, media, traditional and innovative, and individuals interested in various capacities.

This trend is confirmed by users' analysis. In the case of #crowdfunding, there is no real centrality in the network, but many users are identified who produce tweets but exchange with few other users. For this reason, the relationships are rather diluted. The most active users are crowdfunding platforms (f.i. @wearestarting, @crowdinvestSA, @4crowdfunding), private users who very often use this tool to finance their own entrepreneurial activities, specialized information sites (@milanofinanza, @ilsole24ore). For the hashtag #equitycrowdfunding, in the three strongest networks within the cloud generated, crowdfunding platforms assume a central position, followed by general (f.i. @lastampa, @larepubblica) and specialized media and private users.

Given the particularity of the cloud generated by the topic of crowdfunding, the betweenness analysis was conducted only on the #equitycrowdfunding hashtag (Table 3) whose statistical significance of the differences between the groups was tested using the ANOVA test (Table 4).

Table 3. Betweenness Analysis on Retweets with hashtag #equitycrowdfunding.

	Number of Retweet	Betweenness on Average	Standard Deviation
<b>Crowdfunding Platforms</b>	386	0.4705	0.1613
<b>Media</b>	121	0.3302	0.2128
<b>Individual Users</b>	106	0.2522	0.5916

Source: Authors' elaboration on Twitter data.

Table 4. ANOVA Test - Statistical Significance of Betweenness Analysis Results.

	Sum of Squares	df	Mean Square	F	Sign
<b>Between Group</b>	84.31	2	0.2522	18.634	.000
<b>Within Group</b>	104.73	27	0.4705		
<b>Total</b>	189.04	29			

Source: Authors' elaboration on Twitter data.

The results of the betweenness analysis confirm what emerged from the observation of interaction networks between users.

In the case of equity crowdfunding, the centrality is represented by crowdfunding platforms through its Twitter official accounts, followed by general users through personal profiles and only lastly by media.

## 5. Conclusions, implications and future lines of research

To the authors' knowledge this is the first research that has jointly investigated equity crowdfunding model and web 2.0 in the Italian market. In particular, this study contributes to the literature on equity crowdfunding by clarifying some aspects related to the diffusion of news through social networks (Twitter).

The recently changes in Italian regulatory on equity crowdfunding with the update of the Consob regulation that took place in the first months of 2018 has rekindled the debate on the theme of crowdfunding, with particular regard to equity crowdfunding. In particular, the extension of possibility to all SMEs that meet certain requirements to access the equity crowdfunding tool, introduced by Consob with Resolution n. 20264 of 01/17/2018, was an opportunity for the media, with particular regard to social networks like Twitter, an opportunity to ignite the debate on the subject.

But in this case, how did the news spread? Who are the key players in their circulation?

Our paper has verified some aspects related to the diffusion of news through social networks – in this case, Twitter - concerning the crowdfunding tool and more specifically of equity crowdfunding. Considering the tweets selected on the basis of the hashtag #crowdfunding and #equitycrowdfunding in the period of January 2018 - April 2019, first of all a coverage analysis was carried out with the aim of detecting the media coverage of the analyzed events from which emerges as an higher number of tweets and users has spoken about equity crowdfunding in relation to two precise moments: the introduction of the new Consob regulation on equity crowdfunding at the beginning of 2018 and the growth of the use of this instrument, as attested in the data of the “Crowdinvesting Observatory” (Politecnico of Milan, 2019) in the first quarter of 2019.

The greater coverage for equity crowdfunding confirms some requirements of the news of Galtung and Ruge (1965): regulatory innovation and the public interest in it makes the theme of equity crowdfunding more suitable to become news than generic crowdfunding.

Our analysis also shows how the retweet cloud generated by #crowdfunding is composed of many users but without them generating a real network. On the contrary, the retweets related to #equitycrowdfunding generate a cloud with fewer users but that produce more retweets by creating four different networks in which stronger communication relationships are established.

Through the betweenness analysis, carried out on the #equitycrowdfunding hashtag, the centrality in the networks is assumed by the operators of the sector, with particular regard to crowdfunding platforms, followed by traditional and specialized media.

The results show different implications. First of all, to the request by the supervisory authorities for greater and better communication in terms of transparency, operators could respond using the powerful social media channel, with particular regard to Twitter. Correctness and clarity in non-mandatory communication, as well as the use of especially unconventional media channels by crowdfunding platforms, could have positive repercussions on investors' knowledge and awareness. Moreover, careful use of hashtags shows better results in terms of information dissemination. Choosing a specific hashtag generates retweet cloud with information dissemination networks among stronger users.

From a managerial point of view, the supervision of social networks by personnel with specific professional skills can be a successful driver for operators in the sector, not only to safeguard their reputation, but to stimulate the processes of co-creation of essential value in the crowdfunding market. Our study provides empirical evidence of the importance of the connections in equity crowdfunding, because they help to increase pitch popularity and therefore attract potentially more investors and capital: according to social network theory applied to entrepreneurial finance, social networks help to reduce uncertainty and grab attention of users that in the case of equity crowdfunding, could be investors in the projects.

These results can help also the project initiators in order to better understand that the activity on social media affects crowdfunding success. Starting from the project presentations, the project initiators should include enriched media to support comprehensive communication by including various levels of communication in order to grab the potential investors' attention. Frequent project updates published through the social media account of the project initiators plays an important role in fundraising success on equity-crowdfunding platforms. This result is very good news for project initiators because updates of projects are an easy and low-cost action compared to other possible actions, as traditional advertising.

For these reasons, future development of our research regards an analysis of crowdfunding projects success, in light of the results of the SNA, in order to verify if the higher number of the connections between different users in the network helps to increase the success of a campaign.

## References

- Agrawal, A.K., Catalini, C., Goldfarb, A. (2015). Crowdfunding: geography, social networks, and the timing of investment decisions. *Journal of Economics & Management Strategy*, 24(2), 253-274.
- Ahlers, G., Cumming, D., Günther, C., Schweizer, D. (2015). Signaling in Equity Crowdfunding. *Entrepreneurship Theory and Practice*, 39(4), 955-980.
- Armstrong C.L., Gao F. (2010), "Now tweet this: How news organizations use twitter", *Electronic News*, 4(4), 218-235.
- Bansal H.S., Voyer P.A. (2000), "Word-of-mouth processes within a services purchase decision context", *Journal of Service Research*, 3(2), 166-177.
- Barbi, M., Bigelli, M. (2017). Crowdfunding practices in and outside US. *Research in International Business and Finance*, 42, 208-223.
- Bausch S., Han L. (2006), "Social networking sites grow 47 percent, year over year, reaching 45 percent of web users". Available from: [http://www.nielsennetratings.com/pr/pr\\_060511.pdf](http://www.nielsennetratings.com/pr/pr_060511.pdf).
- Beier, M., Wagner, K. (2015). Crowdfunding Success: A Perspective from Social Media and E-Commerce, *Thirty Sixth International Conference on Information Systems*, Fort Worth, 1-22.
- Belleflamme, P., Lambert, T., Schwienbacher, A. (2013). Individual crowdfunding practices. *Venture Capital*, 15(4), 313-333.
- Belleflamme, P., Lambert, T., Schwienbacher, A. (2014). Tapping the Right Crowd. *Journal of Business Venturing*, 29(5), 585-609.
- Bollen J., Pepe A., Mao H. (2011), "Modeling public mood and emotion: Twitter sentiment and socio-economic phenomena", *Proceedings of the Fifth International AAAI Conference on Weblogs and Social Media (ICWSM 2011)*, pp 450-453, Menlo Park, CA: AAAI Press.
- Bradford, S.C. (2012). Crowdfunding and the federal securities laws. *Columbia Business Law Review*, 1-150.
- Brown J.J., Reingen P.H. (1987), "Social Ties and Word-of-Mouth Referral Behavior", *Journal of Consumer Research*, 14(3), 350-62.
- Carretta, A., Farina, V., Nako, A. (2013), "Web 2.0, mass media e circolazione delle notizie finanziarie: il caso dello spread btp-bund", in Bracchi G., Masciandaro D. (eds),

La banca commerciale territoriale nella crisi dei mercati, XVII Rapporto sul Sistema Finanziario Italiano, Fondazione Rosselli, Edibank - Bancaria Editrice, Milano.

Cecere, G. Le Guel, F., Rochelandet, F. (2017). Crowdfunding and social influence: an empirical investigation. *Journal Applied Economics*, 49(57), 5802-5813.

Cha M., Haddadi H., Benevenuto F., Gummadi K.P. (2010), "Measuring user influence in twitter: The million follower fallacy", *Proceedings of the Fourth International AAAI Conference on Weblogs and Social Media (ICWSM 2010)*, 10-17, Menlo Park, CA: AAAI Press.

Colombo, M.G., Franzoni, C., Rossi-Lamastra, C. (2015). Internal social capital and the attraction of early contributions in crowdfunding, *Entrepreneurship Theory and Practice*, 39(1), 75-100.

Cox D.F. (1963), "The Audiences as Communicators", in Greyser S.A. (a cura di), *Proceedings - American Marketing Association*, 58-72.

De Buysere, K., Gajda, O., Kleverlaan, R. and Marom, D. (2012). A Framework for European Crowdfunding, available at: [http://eurocrowd.org/wp-content/blogs.dir/sites/85/2013/06/FRAMEWORK\\_EU\\_CROWDFUNDING.pdf](http://eurocrowd.org/wp-content/blogs.dir/sites/85/2013/06/FRAMEWORK_EU_CROWDFUNDING.pdf)

De Luca, R. (2015). Il crowdfunding: quadro normativo, aspetti operative e opportunità. *Fondazione Nazionale dei Commercialisti*, July, 1-30

Degenne, A., Forsé, M. (2007). *Introducing Social Networks*. ISM, Sage Publications.

European Council (2014), *Comunicazione della Commissione al Parlamento Europeo, al Consiglio, al Comitato Economico e Sociale Europeo e al Comitato delle Regioni in merito alla possibilità di Sfruttare il potenziale del Crowdfunding nell'Unione europea*, available at: <http://ec.europa.eu/transparency/regdoc/rep/1/2014/IT/1-2014-172-IT-F1-1.Pdf>

Frydrych, D., Bock, A. J., Kinder, T. and Koeck, B. (2014). Exploring entrepreneurial legitimacy in reward-based crowdfunding. *Venture Capital*, 16(3), 247-269.

Galtung J., Ruge M.H. (1965), "The structure of foreign news", *Journal of Peace Research*, vol. 2, n. 1, pp. 64-91.

Giudici, G., Nava, R., Rossi-Lamastra, C., Verecondo, C. (2012). Crowdfunding: the new frontier for financing entrepreneurship? [online]: <http://ssrn.com/abstract=2157429>.

Graziano E.A., Vicentini F. (2018), "Senti chi (ne) parla: Twitter, bail-in e banche in crisi", *Sinergie- Italian journal of management*, vol. 36, n. 107, pp. 233-251, DOI 10.7433/s107.2018.11.

Huberman B.A., Romero D.M., Wu F. (2009), "Social networks that matter: Twitter under the micro-scope", Available at SSRN: <http://ssrn.com/abstract=1313405> , 14(1), 8.

Kleemann, F., Gunter, G. and Rieder, K. (2008). Un(der)paid Innovators: The Commercial Utilization of Consumer Work through Crowdsourcing – *Science. Technology & Innovation Studies*, 4(1), 5-26.

Lazzeretti, L., Capone, F. (2016). R&D networks in High Technology applied to Cultural Goods in Tuscany. A Social Network Analysis. *Sinergie Italian Journal of Management*, 34(99), 75-99.

Mauri A.G. (2011), "Le prestazioni dell'impresa come comunicazione "di fatto" e il ruolo del passaparola", *Sinergie Italian Journal of Management*, 59, 147-159.

Mislove A., Jørgensen S.L., Ahn Y.Y., Onnela J.P., Rosenquist J.N. (2011), "Understanding the Demographics of Twitter Users", *Proceedings of the Fifth*

International AAAI Conference on Weblogs and Social Media, pp. 554-557, AAAI Press.

Mitchell, J.C. (1969). The concept and use of social networks, in Mitchell, J.C. (eds), *Social networks in urban situations*, Manchester: Manchester University Press.

Mollick, E. (2014). The dynamics of Crowdfunding: an exploratory study. *Journal of business venturing*, 29(1), 1-16.

Mollick, E., Kuppaswamy, V. (2014). *After the Campaign: Outcomes of Crowdfunding*. Working papers, University of North Carolina Kenan-Flagler Business School, North Carolina, 9 January.

Money R.B., Gilly M.C., Graham J.L. (1998), "Explorations of National Culture and Word-of-Mouth", *Journal of Marketing, Referral Behavior in the Purchase of Industrial Services in the United States and Japan*, 62(4), 76-87.

Morduch, J. (1999). The microfinance promise. *Journal of Economic Literature*, 37(4), 1569-1614.

Moritz, A., Block, J., Lutz, E. (2015). Investor communication in equity-based crowdfunding: a qualitative-empirical study. *Qualitative Research in Financial Markets*, 7(3), 309-342.

Nevin, S., Gleasure, R., O'Reilly, P., Feller, J., Li, S., Cristoforo, J. (2017). Social Identity and Social Media Activities in Equity Crowdfunding. *OpenSym '17*, August 23–25, 2017, Galway, Ireland, 1-8.

O'Reilly T. (2007), "What is web 2.0? Design patterns and business models for the next generation of software", *International Journal of Digital Economics*, 65, 17-37.

Pais, I., Peretti, P., Spinelli, C. (2014). *Crowdfunding. La via collaborativa all'imprenditorialità*. Egea, Milano, IT.

Pak A., Paroubek P. (2010), "Twitter as a Corpus for Sentiment Analysis and Opinion Mining", *Proceedings of the Seventh conference on International Language Resources and Evaluation (LREC'10)*, European Language Resources Association (ELRA).

Paoloni, P., Paoloni, N., Modaffari, G. (2019). Crowdfunding as a new collaborative process in the knowledge economy: A literature review. *VINE Journal of Information and Knowledge Management Systems*, <https://doi.org/10.1108/VJKMS-12-2018-0118>

Piattelli E.U. (2013). *Il Crowdfunding in Italia. Una regolamentazione all'avanguardia o un'occasione mancata?* G. Giappichelli Editore, Torino.

Poetz, M., Schreier, M. (2012). The value of crowdfunding: can users really compete with professionals in generating new products idea? *Journal of Product Innovation Management*, 29(2), 245-256.

Politecnico of Milan (2019), "Cruscotto aggiornato dell'equity crowdfunding in Italia", <http://www.osservatoriocrowdinvesting.it>.

Previati, D., Galloppo, G., Salustri, A. (2015) The 'Wisdom of the Crowd' as an Antidote to the Credit Crunch: A Preliminary Analysis of Crowdfunding. In: Beccalli, E., Poli, F. (eds) *Lending, Investments and the Financial Crisis*. Palgrave Macmillan Studies in Banking and Financial Institutions. Palgrave Macmillan, London, pp. 22-51.

Quaranta, G. (2017). *Il Crowdfunding*, in Quattrocchio, L.M. (ed.), *Diritto ed Economia dell'Impresa*, Giappichelli Editore, Torino, IT, 915-943.

Renwick, M.J., Mossialos, E. (2017). Crowdfunding our health: Economic risks and benefits. *Social Science & Medicine*, 191, 48-56.

- Rodriguez-Ricardo, Y., Sicilia, M., López, M. (2018). What drives crowdfunding participation? The influence of personal and social traits. *Spanish Journal of Marketing - ESIC*, 22(2), 163-182.
- Rossi, M. (2014). The New Ways to Raise Capital: An Exploratory Study of Crowdfunding. *International Journal of Financial Review*, 5(2), 8-18.
- Scott, S. (2015). The moral economy of crowdfunding and the transformative capacity of fan-ancing. *New Media & Society*, 17(2), 167–182.
- Short, J.C., Ketchen, D.J., McKenny, A.F., Allison, T.H. and Ireland, R.D. (2017). Research on Crowdfunding: Reviewing the (Very Recent) Past and Celebrating the Present. *Entrepreneurship Theory and Practice*, 41(2), 149-160.
- Signori, P., Confente, I. (2014). Consumer's e-signals Prism analysis: impact and implications for corporate communication strategy. *Sinergie Italian Journal of Management*, 93, 175-191.
- Tencalla, M. (2017). Equity Crowdfunding per tutte le PMI con la Legge di Bilancio 2017: aspetti tributari, *Rivista di Diritto Tributario*, 3 February.
- Verschoore, J.R., Zuquetto, R.D. (2016). A Social Network Approach for Crowdfunding, in Méric, J., Maque, I., Brabet, J. (ed.) *International Perspectives on Crowdfunding*. 151-167.
- Wasserman, S., Faust, K. (1994). *Social Network Analysis*. Cambridge University Press, Cambridge.