

## ORIGINAL RESEARCH ARTICLE

# Reward Crowdfunding: Who to Attract at the Beginning of the Campaign? An Analysis in Terms of Revealed Networks of Preferences

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## Abstract

This research study combines the theoretical teachings of revealed preferences, signal theory and weak tie theory to better understand the dynamics at work at the beginning of a campaign and to explain its success. By identifying the revealed preferences of early backers through their common past contributions, we characterize as strong or weak the nature of the complex preference ties between them. We build networks of the contributions made by the individuals identified as early backers to 9,425 campaigns run on the Ulule platform between July 2010 and September 2014. The results of this study underline the importance of the presence of strong preference ties between early backers and other platform users for the success of campaigns. They also corroborate the theory of the strength of weak ties. Later in the campaign, the intervention of backers with less specific preferences, in the position of intermediaries, positively influences the future outcome by accelerating the fundraising speed at the beginning of the campaign.

**Keywords:** *Social network; Social capital; Reward crowdfunding; Early backers; Revealed preferences; Graph theory*

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Mongin (2000) defines revealed preferences (Houthakker, 1950; Samuelson, 1938, 1948) as those that explain the choices made by agents. They take shape in the commitments made (Moureau & Vidal, 2009). Observing them helps us to understand the match between the supply and demand. Based on a scale of constant preferences,<sup>1</sup> we examine how they can be mobilised to fluidify transactions on a market that suffers from problems of overabundant and

asymmetric information. The study focuses on the knowledge that an agent may acquire through sharing certain preferences with others. We consider the different forms of articulation on the market and observe the associated equilibria. These forms of articulation act as aggregating filters for the signals (Spence, 1973) sent out by agents who make commitments, and they determine the reduction of information problems, such as those relating to the difficult-to-observe quality of the elements being negotiated (Connelly et al., 2011) and the intentions of the other parties to fulfil their obligations (Stiglitz, 2000). This is established in a context in which the involuntary nature of the shared preferences and the low stakes that agents' commitments may represent reduce the inclination to lie, thus making the signals emitted all the more credible (Vasudeva et al., 2018).

<sup>1</sup> Consistent, exogenous (do not need to be revised based on the preferences of other individuals) and stable.

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Our enquiry was conducted in the field of crowdfunding.<sup>2</sup> This activity<sup>3</sup> relies on platforms where project initiators looking for financing establish ties with willing backers at a low cost (Kim et al., 2016). Its simplicity has led to a profusion of offers among which it can be difficult to sort the good from the bad (Sanders & Boivie, 2004). The result is that mutually beneficial transactions are not taking place because they are not identified as such. Congestion limits the efficiency of the process (Halaburda et al., 2018). We seek to determine how the different possible combinations of shared preferences among backers affect the way campaigns unfold. The idea is to identify those that can effectively orient the attention of backers and make them aware of the signals emitted by their counterparts. To accomplish this, we model the presence of shared preferences in the form of a network, in which a link is established as soon as two individuals have, at least once in the past, contributed to the same campaign. This enables us to characterise the relationship between the preferences of early backers and those of other users on the platform, and to measure the effects of that characterisation on the campaign's success. Early backers play a role as pioneers (Croidieu & Rüling, 2017), thus paving the way for others with the trust they show in the project. We use a classification based on 'strong ties' and 'weak ties' proposed by Granovetter (1973, 1983) to portray the relationships between their preferences. The presence of strong ties between the preferences of backers is established when they share intricate links, forming cliques. This indicates the existence of communities with clear shared preferences. The presence of weak ties between preferences is established by a weak concentration of links. The individuals concerned can be seen as intermediaries between communities.

This research study builds on the literature on the determining factors in the success of crowdfunding campaigns (see Kuppuswamy and Bayus [2017] and Short et al. [2017] for a literature review). It adds to our understanding of the decisive mechanisms put in place at the beginning of campaigns (Agrawal et al., 2014; Ordanini et al., 2011). These depend, in particular, on the project initiator's mobilisation of social capital. Colombo, Franzoni and Rossi-Lamastra (2015) found that past contributions by project initiators can be used to generate actions of reciprocity on the part of other project initiators

<sup>2</sup> Crowdfunding allows projects, start-ups or companies to raise funds from a 'crowd' of backers via online platforms (Bruton et al., 2015). Funds are allocated with or without consideration in exchange (Belleflamme et al., 2014). There are different types of crowdfunding: reward crowdfunding, which offers more or less symbolic compensation depending on the size of the contribution; lending crowdfunding, which is based on loans with or without interest; and equity crowdfunding, which allows investors to take a share in the capital of the business being financed.

<sup>3</sup> The global crowdfunding market had an estimated value of \$10.2 billion in 2018 and is expected to reach \$28.8 billion by 2025 (Statista, 2019, <https://www.statista.com/statistics/1078273/global-crowdfunding-market-size/>).

previously financed, who intervene early in the fundraising campaign and act as certifiers, providing a form of peer recognition (Shymko & Roulet, 2017). Buttice, Colombo and Wright (2017) complemented this analysis by looking at regular backers of campaigns. Their early mobilisation, beyond the sums contributed, increases the chances of success in the campaign, provided the time elapsed between two contributions is limited.

This research study was conducted using data made available by the reward crowdfunding platform Ulule.<sup>4</sup> These data cover 9,425 campaigns run between July 2010 and September 2014. For each month, it allows us to draw up the network of shared preferences between users and to infer from the overlap between these preferences the prevalence of strong or weak ties among early backers. This is done using measurements borrowed from the graph theory (Jackson, 2008).

The findings of this study confirm the importance of early campaign dynamics in explaining their success or failure. The speed with which funds are raised during this period proves to be an important predictor of the final outcome. The intensity of the presence of backers who have strong preference ties with the rest of the users (who belong to cliques) is found to positively affect the probability (achieving the target) and intensity (exceeding the target) of the campaign's success, regardless of the duration of the period considered as the beginning of the campaign. The intensity of the presence of backers who have weak preference ties is found to have positive effects for longer periods considered as the beginning of the campaign (one-sixth of the entire campaign duration or more). This, therefore, points to a form of sequence when it comes to the key agents to mobilise during a crowdfunding campaign. All of this opens up new questions, both theoretical and practical, which the tools developed and implemented here can help to clarify in future research: How are communities of preferences constructed? Which mechanisms lead to their mobilisation in the context of a campaign? How can platforms encourage them and make them as efficient as possible, with the view of fluidifying exchanges and reducing problems of information and congestion phenomena?

## Literature and hypotheses

### Theoretical framework

Two types of information problems affect the smooth running of developed<sup>5</sup> crowdfunding platforms: congestion and

<sup>4</sup> Ulule is a platform based on the 'all or nothing' principle. In other words, on this platform, the funds raised are only handed over to the project initiator if the target sum identified at the beginning of the campaign is reached. Otherwise, the money is returned to the project backers.

<sup>5</sup> One that has a large number of users, that is, project initiators and potential backers.

information asymmetry. The first is the result of the abundance of offers made possible by the low cost of posting them online (Kim et al., 2016). Backers potentially interested in some projects must first manage to identify them, which can be costly in terms of the time and level of attention needed. Some campaigns are, therefore, deprived of support because they are not included by users among their possible choices. The second is linked to the fact that backers have no guarantee that the project funded has a chance of being successfully implemented by its initiator; either because from the outset it exceeds his or her capacities or because insufficient efforts are made.

Added to this is the uncertainty of what will happen to contributions under the 'all or nothing' mechanism adopted by many platforms to discourage poor-quality project initiators (Cumming et al., 2020). Only those campaigns that reach their initial target will receive the funds promised; otherwise, the money is reimbursed. Each potential backer must, therefore, before deciding whether to offer support weigh up the future of the campaign.

Project initiators endeavour to overcome these difficulties by communicating both in relation to what they intend to do with the funds raised and in relation to the campaign's progress (Connelly et al., 2011). Potential backers can complement and cross-check this information with publicly available information. The process nonetheless remains costly for them and subject to possible optimism bias (Kim et al., 2016). Only the most motivated among them will seek to reduce information asymmetries (Sanders & Boivie, 2004), with a view of making an informed decision. They are likely to act early in the campaign. Their financial support can then be interpreted by other potential backers who share some of their preferences as a signal of quality and positive prospects regarding the campaign outcome (Connelly et al., 2011; Spence, 1973).

Given that the preferences of backers cannot be directly observed, they are inferred from their behaviour. This is the revealed preferences approach introduced by Samuelson (1948) and operationalised by Afriat (1967), which has then undergone many developments (for a review, see Crawford & De Rock, 2014; Varian, 2006). Revealed preferences are defined as the only ones that can explain the choices made.<sup>6</sup> They are used to establish ties (Chiong, 2015; De Paula, et al., 2018; Moureau & Vidal, 2009), which are, in turn, used in recommender systems based on relationship filtering (Medo, 2013; Moureau & Vidal, 2009; Yu et al., 2016). These ties form a network whose structure reflects that of the shared preferences between backers. We use the information taken from

<sup>6</sup> As noted by Beshears et al. (2008), there can be a disparity between revealed preferences and those that correspond to optimal choices, that is, normative preferences. We, therefore, make no particular assumption on the way in which backers make their choices other than that they opt for what seems preferable to them at a given point in time in light of the options available to them.

the network analysis using the same approach as in networks of citations (De Solla Price, 1965) or academic collaboration (Dubois & Walsch, 2017), allowing us to qualify the relationship between early backers and other platform users. Their position within the network is a marker of their importance (Allmayer & Winkler, 2013; Pinski & Narin, 1976), the intensity of the differences between them (Bommarito II et al., 2010) or even the absence of any common bond (Newman, 2001a, b). Similar to an article frequently cited in a particular field or one that draws a connection between several fields, a backer's position within the network marks the possibility for the campaign that has attracted that backer to benefit from the 'inspiration effects' or 'information effects' associated with that position.

In order to operationalise this distinction, we draw on the notions of 'strong ties' and 'weak ties' developed by Granovetter (1973, 1983) to assess the social capital of individuals (Lin, 2001). This takes the form of a network of personal relationships<sup>7</sup> that are more or less stable and lasting, in which the parties voluntarily share resources and information (Dominguez et al., 2017; Ferrary, 2001). The individuals concerned displayed degrees of reciprocal commitment ranging from family ties or friendship to mere acquaintances. The first type of tie is described as strong insofar as it is easy to mobilise when it comes to accessing resources (Uzzi, 1997). In contrast, the second tie is described as weak since these individuals are very unlikely to share resources. Weak ties are nonetheless important to the extent that they provide access to original information not available from one's close contacts (Dominguez et al., 2017; Granovetter, 1995; Mayer, 2012; for a critique see Gee et al., 2017). Granovetter (1995) referred to this as the strength of weak ties. His reasoning is backed up with techniques that can be used to qualify the nature of ties between individuals based on the geometric shape of their connections within their social networks. Strong ties are characterized by dense connections and underpin communities, in which each individual is linked. The 'forbidden triad' mechanism ensures this attachment. If one person is friends with two others, it is rare that these two friends do not end up frequenting one another, and thus, ultimately establishing a friendship themselves (Heider, 1946). Weak ties are described as channels between communities (Vasudeva et al., 2018). They are located in more sparsely populated sectors within the network, and their presence is generally revealed by the observation of structural holes in the canvas of relationships (Burt, 1980, 1992, 2004).

<sup>7</sup> Dominguez et al. (2017) define a network as 'a set of ties built by and among individuals and/or organizations'. They distinguish between 'social' networks, which are based on 'trust, mutual obligations and the satisfying of their members' social expectations', and 'calculative' networks, which are governed by the satisfying of their members' economic expectations'.

We transpose this distinction between strong and weak ties to the overlap between the preferences of backers on the crowdfunding platform so we can qualify the ties between early backers and other users in an effort to better understand the conditions underpinning the success of a campaign.

### **Success in reward crowdfunding**

Previous studies on crowdfunding identify four main types of factors that contribute to the success of campaigns: establishing a climate of trust, the involvement of backers, the signals sent out by the project initiator and certification by backers.

Any exchange, before it can be undertaken, at least requires the parties to believe in their reciprocal intentions to keep their promises. The legal framework, standardisation and the pricing system further reinforce and facilitate the system, allowing the parties to move beyond their personal relationship in their apprehension of uncertainty. In the context of crowdfunding, the existing level of knowledge between early backers and other users is limited. Yet, this level of knowledge remains central to the match between supply and demand (De Larquier, 1997; Roth & Sotomayor, 1992). Project backers base their support more on affinity than pricing. Altruism (Allison et al., 2015; Cholakova & Clarysse, 2015) and homophily (Greenberg & Mollick, 2017) emerge as crucial factors in this domain.

This personal dimension can be reinforced if the project initiator puts in place mechanisms designed to encourage backers to help to finalise the project. Bœuf, Darveau and Legoux (2014) noted the effectiveness of this approach in the context of theatrical projects. Belleflamme et al. (2014) showed that when the campaign involves presales, a communication approach targeting the involvement of backers gives them a sense that they belong to a group of privileged clients, which results in more contribution to the campaign's promotion.

When choosing the right configuration for their campaign, project initiators may opt for certain methods that make it more difficult to secure funds so as to stand out from less credible campaigns. Cumming et al. (2020) showed that by choosing the 'all or nothing' system, which makes the availability of the financial contributions dependent on the goal being reached, the best-performing project initiators can stand out from the rest. Hakenes and Schlegel (2014) pointed out that for this type of campaign, setting a high target is perceived by backers as a marker of the project's quality.

Beyond this mechanism, observing the behaviour of other platform users with regard to the campaign serves as a reference for potential backers trying to decide whether to contribute. If their behaviour is positive, it effectively certifies the quality of the project. Mobilising the project initiator's social capital at the beginning of the campaign is of fundamental importance (Agrawal et al., 2015; Ordanini et al., 2011).

The intervention of loved ones, friends and family members (Agrawal et al., 2014, 2015), as well as online (Mollick, 2014; Ordanini et al., 2011) and *in vivo* contacts (Zheng et al., 2014), demonstrates the trust they have in the project initiator. Ties developed on the platform through contributions made to campaigns launched by others is also a source of early contributions, thus, signalling that the project is worthy of interest. This generates peer recognition (Shymko & Roulet, 2017) in the form of reciprocal actions (Colombo et al., 2015).

Whatever the circumstances, it appears to be crucial for a campaign to mobilise quickly so it can trigger a dynamic. Kuppuswamy and Bayus (2017) noted that contributions are more likely to be made as the total funds raised approach the target. It then becomes clear to backers that their actions count.

### **Research hypotheses**

We study as a determining factor in the success of campaigns the early mobilisation of backers whose preferences overlap with those of other users in a particular way, with either strong or weak preference ties. These ties serve as markers of the appeal that the campaign may generate on the platform, and therefore, its capacity to attract attention. This appears to be crucial in order for potential backers to interpret the signal sent out by the trust that early backers placed on the project. In this way, with any uncertainties regarding the project and the fundraising now attenuated, these potential backers are more likely to support the campaign, which, in turn, improves its chances of success. Before we go any further, it should be pointed out that this success is understood in two ways: firstly, we consider whether the fundraising target has been met. Secondly, we look at the amount of money collected in relation to that target. This second measurement serves to enrich the analysis insofar as it provides an idea of the intensity of a campaign's success or failure. It should be remembered that the amount raised may significantly exceed the target (Du et al., 2019; Kuppuswamy & Bayus, 2017; Petitjean, 2018). The presence of strong preference ties seems more likely to positively affect campaigns to the extent that they mark the inclusion of early backers in communities who are probably more interested in what the project initiator is proposing. The members of these groups with significant shared preferences are more likely to promote the project being funded and to see the selection process undertaken by its early backers as being credible. These assumptions lead to our first set of hypotheses:

H1a: The more early backers have strong preference ties with other users, the greater the probability that the campaign will be successful.

H1b: The more early backers have strong preference ties with other users, the greater the intensity of the campaign's success.

The presence of weak preference ties between early backers and other platform users does not have the same effect. It indicates less specificity in the benefits that the project being funded offers its potential backers, who at best will notice that a marginal member of their community, that is, a vague acquaintance, has supported the campaign. This is unlikely to focus their attention on the campaign and does not allow them to judge the pertinence of the signal sent out by the support of other backers, as it is difficult to put themselves in their shoes. For these potentially interested parties, the commitment made by early backers is at best one piece of information among many. These assumptions lead to our second set of hypotheses:

H2a: The more early backers have weak preference ties with other users, the lesser the probability that the campaign will be successful.

H2b: The more early backers have weak preference ties with other users, the lesser the intensity of the campaign's success.

The level of commitment by early backers can vary, thereby reflecting their interest in the project being funded. If the funds raised are significant in relation to the target at the beginning of the campaign (the speed of fundraising over the duration considered as the beginning), this is a sign of great enthusiasm for the project, while a low amount indicates little enthusiasm. The extent to which a backer is attracted to a project depends on its capacity to satisfy their preferences. The attraction is greater if what is on offer specifically matches the backer's needs, and therefore, targets a particular community rather than proposing a standard service. And so, it is greater if the project backers have strong preference ties with other users, leading us to our next hypothesis:

H3: The more early backers have strong preference ties with other users, the faster the fundraising at the beginning of the campaign.

The flipside of this reasoning is that campaigns that attract early backers with more weak preference ties have less specific offerings, and therefore, a lower motivational capacity. There are more possible substitutes for the project that could satisfy backers' needs. This leads us to our fourth hypothesis:

H4: The more early backers have weak preference ties with other users, the slower the fundraising at the beginning of the campaign.

Empirical studies have highlighted the importance of the speed of early fundraising for the success of a campaign. Therefore, we should consider the indirect impact of the prevalence of one type of preference tie or the other on this success via the mediating effect of fundraising speed. The presence of strong ties can, in fact, favour campaign's success both directly and indirectly by accelerating fundraising efforts. The following two hypotheses take this into account:

H5a: The faster the early fundraising, the greater the probability of success.

H5b: The faster the early fundraising, the greater the intensity of success.

Figure 1 summarises all of the anticipated effects, as well as our hypotheses.

## Methodology of empirical study

### Sample

We use a set of data from the Ulule<sup>8</sup> website covering 9,425 campaigns<sup>9</sup> that were launched between July 2010 and

<sup>8</sup> Ulule's model is close to that of Kickstarter, the American platform, whose data are most often used in studies on reward crowdfunding. The website can be accessed at <https://fr.ulule.com/>.

<sup>9</sup> See Appendix 1 for the detailed phases that led to the final sample.

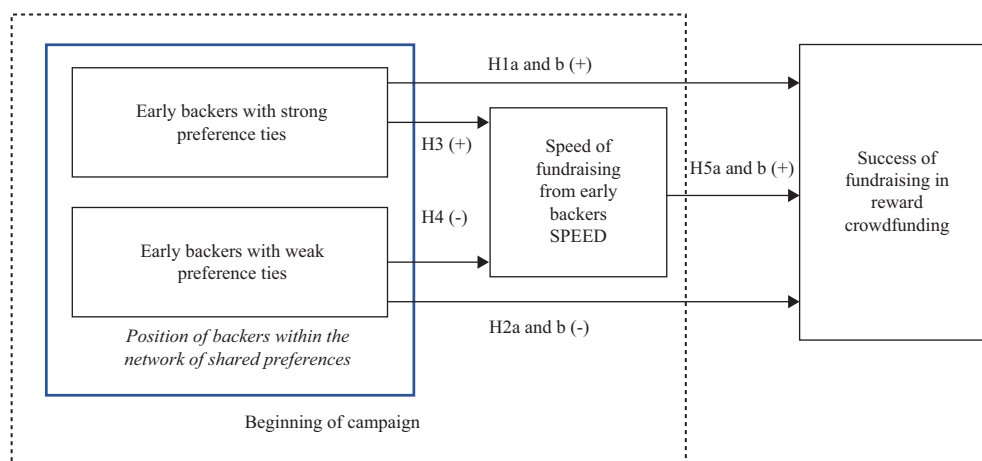
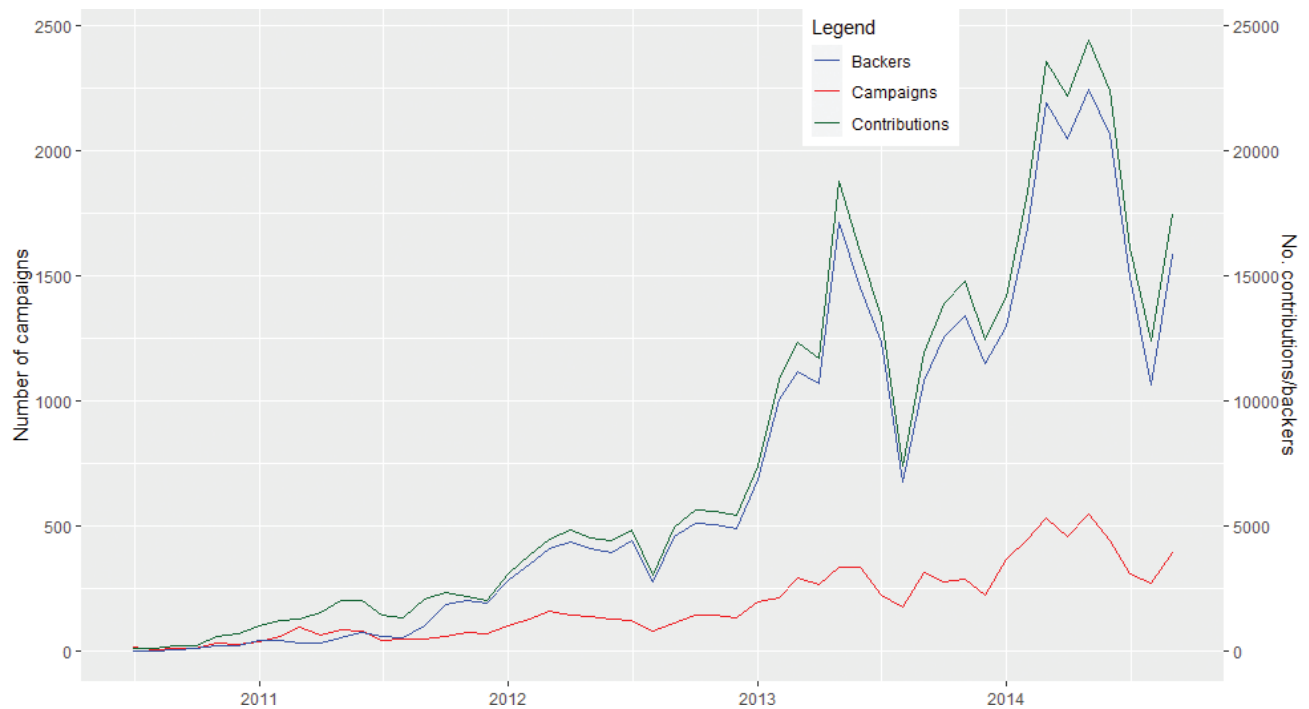


Figure 1. Anticipated relationships



**Figure 2.** Growth of Ulule's activities

September 2014 (52 months of activity). This includes the platform's pre-launch phase (July–October 2010). As shown in Figure 2, Ulule experienced strong growth in terms of the number of campaigns launched, the contributions made and the number of backers mobilised. A total of €19 million was raised.

The users of Ulule have access to information on backers, 'early birds' and their profile (present and past contributions). Some of them can flag themselves as fans of specific projects. For each campaign, a gauge symbol indicates the level of funds raised and the remaining amount before the target is reached. Information is also provided on the project initiator's participation in other campaigns. Finally, each project initiator communicates in relation to the campaign via a 'news' section or by email.

## Variables

### Fundraising success and speed

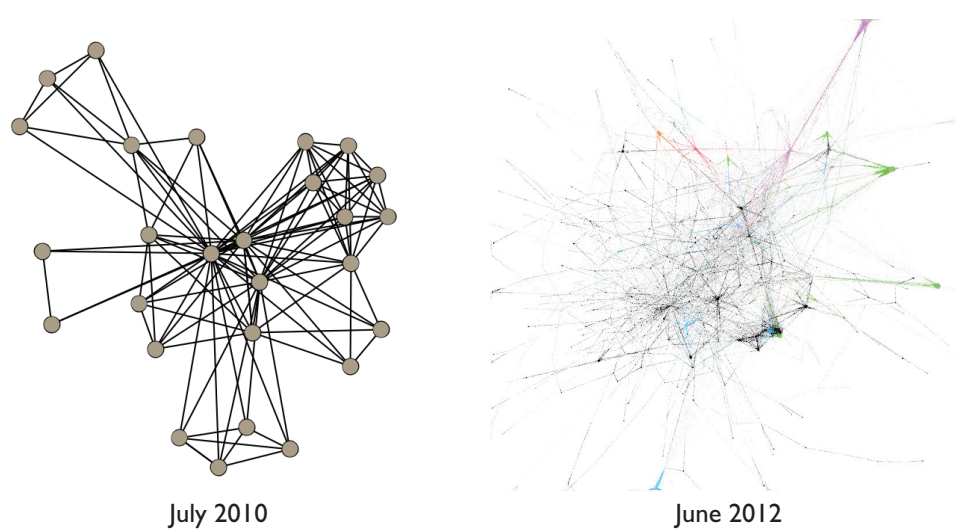
We chose two measures of success frequently used in the literature as our dependent variables (Du et al., 2019; Kuppuswamy & Bayus, 2017; Petitjean, 2018). The first, SUCCESS, has a value of 1 if the final amount raised is greater than the target set at the beginning of the campaign, and 0 otherwise. The second, DELTA, is the amount of money raised as a percentage of the target.

The variable SPEED acts as a mediator of the effect of our explanatory variables on the success of campaigns. We measure it as the ratio of the total amount of funds raised to the target in the period considered as the beginning of the campaign. It is obtained for four durations: the first 24 h, 1/10, 1/6 and 1/3 of the total campaign duration.

### The presence of strong and weak preference ties

As indicated above, the configuration of an individual's contacts within a network of relationships can be inferred, as well as the type of ties they have with their neighbours. Strong ties are characterized by the density of connections with and around the individual. This density indicates membership in a community. Weak ties are identified by the presence of structural holes. They enable different communities to connect. We apply this reasoning to our network of preferences, which is constructed based on the past contributions to the same campaigns. A connection between two individuals is established, provided they have both funded the same campaign in the last 9 months.<sup>10</sup> The network is constructed for each month in the study period (making 52 networks) with a sliding window so

<sup>10</sup> This choice is the result of a compromise. It corresponds to the maximum size we were able to manage, given the calculation capacities at our disposal.



**Figure 3.** Images of the giant component of the network of backers

the connections can be corrected and enriched. Figure 3 presents the giant component (the largest connected part of the network) of backers in July 2010 and June 2012. The visual is generated using Hu's (2006) algorithm, which moves the most connected sets closer to one another and removes them from the rest.

To appreciate the importance of the existing strong and weak preference ties between early backers and other users, we use synthetic indicators to reveal the form their connections take. These measures are established from the network's configuration 1 month before the campaign's launch. This precaution allows us to exclude links established at the time of the launch, thus making the causality clearer. We used four topological measures<sup>11</sup>: normalised degree, clustering, betweenness and eigenvalue centrality. The average for early backers is calculated for each one, giving us the variables *DEGREE*, *CLUSTERING*, *BETWEENNESS* and *EIGENVALUE*. These are then obtained for the four durations (24 h, 1/10, 1/6 and 1/3) of the overall campaign duration.

The normalised degree corresponds to the number of an individual's connections as a ratio of the total number of connections in the network. Clustering measures the transitivity of ties and corresponds to the number of cliques (closed triangles) whose apex is the reference backer, as a ratio of the total number of possible cliques. These two indicators are positively correlated with the presence of strong preference ties to the extent that they reflect the density of relationships with and around the backer in question.

<sup>11</sup> Appendix 2 presents in more detail the four topological measures chosen for this study.

Betweenness corresponds to the number of times the individual is located along the shortest path between two others as a ratio of the total number of shortest paths in the network. Eigenvalue centrality is an equivalent that weighs the fact that the backer is connected to other backers with a high degree. These two indicators are positively correlated with the presence of weak preference ties to the extent that they reflect the importance of the individual in question as an intermediary within the network. Table 1 provides a summary of the anticipated effects in relation to our hypotheses.

### Control variables

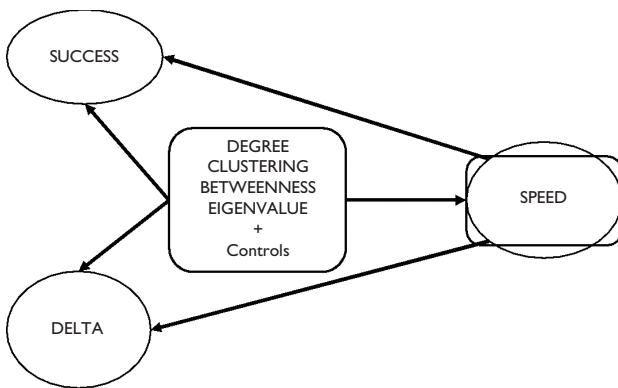
We used two types of control variables: continuous and discrete. The former only relate to the campaign, that is, the variables *AMOUNT*, which corresponds to the fundraising target in euros, *DURATION*, which corresponds to the number of days the campaign ran, and *INFO*, which corresponds to the number of information exchanges made between the project initiator and users during this period, whether in the form of news posted on the campaign page or comments. The discrete variables relate to the project initiator and the relevant sector. They take the form of two series of indicator (dichotomous) variables relating to the type of project initiator (association, company or private individual) and the type of activity being funded (15 different sectors).

### Test specifications

We used a multivariate regression analysis. A maximum likelihood estimation logit model was used for *SUCCESS*, while a

**Table 1.** Summary of hypotheses and anticipated effects on dependent variables

Hypotheses	Explanatory variables	Anticipated effects on SUCCESS	Anticipated effects on DELTA	Anticipated effects on SPEED
H1a, H1b and H3	DEGREE	+	+	+
	CLUSTERING	+	+	+
H2a, H2b and H4	BETWEENNESS	-	-	-
	EIGENVALUE	-	-	-
H5a, H5b	SPEED	+	+	



**Figure 4.** Test specification

linear log–log model was used for DELTA and the mediator variable SPEED. In order to ensure homogeneity of the elements in these models, we logged the values for the continuous variables.<sup>12</sup> The estimations were made on the subsamples of campaigns that received at least one contribution during the period considered as the beginning of the campaign. They are provided for those that raised funds during the first 24 h (67.4% of campaigns) and the one-tenth (89.1%), one-sixth (89.4%) and one-third (95.1%) of the entire fundraising duration. Figure 4 summarises the modelling carried out. Each oval represents one dependent variable, and rectangles indicate the explanatory and control variables. The arrows indicate the direction of assumed influence.

**Results**

**Descriptive statistics**

Table 2 presents a series of descriptive statistics that provide an overview of the campaigns. It shows that 61.88% of the campaigns were run by private individuals, 31.12% of them by associations and 6.99% by companies. The average fundraising target was €2,712.38 over a duration of approximately 45 days (44.74). Associations are more often successful in reaching

<sup>12</sup> We began by adding one to these variables in order to eliminate values of 0, for which the logarithm is not set up.

their target: 74.68% of them succeeded compared with an overall success rate of 66%. Successful campaigns exceeded their target by an average of 25.3%, having mobilised just over 54 backers and attracted 60 contributions. Campaigns that failed only reach an average of 15% of their target, having mobilised an average of 11.45 backers and attracted just 12.48 contributions.

The table presents a series of descriptive items from the sample, distinguishing between the different types of project initiators: association, company or private individual. It also indicates the number of campaigns (as a proportion), the average (median) amount of their fundraising target, their duration, success rate, the number of backers mobilised, as well as the average number of contributions made.

The campaigns related to 15 different sectors, from film and video to heritage conservation initiatives<sup>13</sup> and from fundraising for sports events to the development of technologies. In order to provide a clearer image of this diversity, we divided the different activities into four main categories: the arts, entrepreneurship, solidarity and residual category, intended for the remaining campaigns that were difficult to classify. Table 3 presents the breakdown of sample into main categories. Among the 5,017 campaigns, artistic projects are the numerous (53,23% of the all projects). They are also the most successful with the highest success rate of 71.2%, followed by solidarity projects (67.34%) and entrepreneurial projects (56.30%). Artistic projects made up 56.65% of campaigns run by private individuals, 49.49% of those run by associations and 39.61% of those run by companies. Entrepreneurial projects made up only 24.94% of the sample. They were mainly run by private individuals (1,510 out of 2,350 projects – 64.26%) but represent the biggest proportion of campaigns run by companies (49.17%). Solidarity projects constituted 20% of the sample and were mainly run by associations, which were most successful in reaching their fundraising target (74.09%).

The table provides the breakdown of the projects in the sample into four main categories: the arts, entrepreneurship,

<sup>13</sup> The 15 areas are as follows: arts and photography, citizens and charity, childhood and education, comic books, craft goods and food, fashion and design, film and video, games, heritage, music, other projects, publishing and newspapers, sport, theatre, and technology.



**Table 2.** Sample description

Variables	Type of project initiators			
	Association	Company	Private individual	Total
No. of campaigns	2,934	659	5,832	9,425
%	31.12	6.99	61.88	100
Average amount (in euros)	2,476.58	6,469.91	2,406.42	2,712.38
median	2,000	3,500	1,500	1,900
Average duration (in days)	45.6	50.97	43.6	44.74
% of successes	74.68	68.13	61.39	65.99
<b>Fundraising surplus (%)</b>	95.03	101.81	82.72	87.88
Success	121.75	141.99	125.39	125.3
Failure	16.26	15.89	14.88	15.26
<b>Average no. of backers</b>	42.8	100.11	31.46	39.79
Success	53.09	139.13	44.56	54.39
Failure	12.46	16.66	10.64	11.45
<b>Average no. of contributions</b>	47.46	111.44	35.02	44.24
Success	58.9	155.24	49.77	60.6
Failure	13.7	17.81	11.58	12.48

**Table 3.** Breakdown of sample into main categories

Variables	Type of project initiators			
	Association	Company	Private individual	Total
<b>Arts</b>	1,452 (49.49)	261 (39.61)	3,307 (56.65)	5,017 (53.23)
Success	1,122 (77.27)	202 (77.39)	2,248 (68.04)	3,572 (71.20)
Failure	330 (22.73)	59 (22.61)	1,056 (31.96)	1,445 (28.80)
<b>Entrepreneurships</b>	516 (17.59)	324 (49.17)	1,510 (25.89)	2,350 (24.94)
Success	359 (69.57)	209 (64.51)	755 (50.00)	1,323 (56.30)
Failure	157 (30.43)	115 (35.49)	755 (50.00)	1,027 (43.70)
<b>Solidarity</b>	930 (31.70)	51 (7.74)	905 (15.52)	1,886 (20.01)
Success	689 (74.09)	31 (60.78)	550 (60.77)	1,270 (67.34)
Failure	241 (25.91)	20 (39.22)	355 (39.23)	616 (32.66)
<b>Other</b>	36 (1.23)	23 (3.49)	113 (1.94)	172 (1.82)
Success	21 (58.33)	7 (30.43)	27 (23.89)	55 (31.98)
Failure	15 (41.67)	16 (69.57)	86 (76.11)	117 (68.02)

solidarity and a residual category. We also indicate each project's outcome, success or failure, as well as the type of project initiator: association, company or private individual. The figures presented are the number of projects in each category and, in parenthesis, the percentage that number represents for each type of project initiator.

Table 4 provides an overview of the different forms of speed (position in relation to the target, the final amount raised, the final number of backers and the total number of contributions) for the different periods considered. On average for the sample as a whole, 18.15% of the campaign target was reached after just 10% of the total campaign duration. This favourable figure, nonetheless, hides significant disparities between the campaigns that went on to succeed, which over the same period raised 24.86% of their target, and those destined to fail, which raised only 5.14%. The ultimately successful campaigns raised funds much more quickly than the rest, with reaching 50% of their target in a little less than a third of the campaign duration. They had raised half of the final amount collected midway through the campaign, mobilised half of their backers in a little over one-third of the planned campaign duration and raised half of their contributions in 40% of the same duration. Campaigns that are a failure rapidly reached their limit and have a much slower fundraising speed: they collect less than the objective at the beginning of the campaign. Midway through the campaign, they raised 81.54% of their promised funds, and mobilised around 83% of their backers and contributions (only 8–9).

For each sub-period of the fundraising duration, in regular 10% increments of the initial planned duration (from 10 to

**Table 4.** Fundraising speed

Position in relation to Duration	Target			Amount raised			Number of backers			Number of contributions		
	Total	S	F	Total	S	F	Total	S	F	Total	S	F
10	18.15	24.86	5.14	27.00	18.85	42.82	31.71	24.24	46.19	29.95	22.21	44.96
20	27.87	38.38	7.46	39.38	29.17	59.19	45.43	36.47	62.82	43.35	33.92	61.65
30	35.25	48.73	9.09	48.11	37.17	69.33	54.66	45.45	72.52	52.49	42.68	71.52
40	41.41	57.46	10.26	54.98	43.93	76.42	61.68	52.78	78.96	59.55	49.95	78.19
50	47.22	65.80	11.15	61.10	50.56	81.54	67.82	59.62	83.74	65.77	56.84	83.11
60	52.50	73.39	11.97	66.63	56.68	85.94	73.26	65.82	87.69	71.38	63.22	87.20
70	58.20	81.63	12.75	72.44	63.41	89.96	78.73	72.26	91.27	77.04	69.89	90.90
80	64.50	90.79	13.48	78.61	70.97	93.43	84.28	79.10	94.33	82.91	77.14	94.10
90	72.36	102.28	14.28	85.94	80.48	96.55	90.58	87.23	97.09	89.58	85.80	96.93
100	87.88	125.30	15.26	100	100	100	100	100	100	100	100	100
24 h	6.40	8.69	1.95	10.21	6.55	17.31	12.25	8.80	18.94	11.40	7.88	18.24
1/6	25.01	34.37	6.83	35.88	26.07	54.91	41.67	32.97	58.57	39.66	30.52	57.41
1/3	37.38	51.73	9.52	50.53	39.52	71.89	57.15	48.04	74.81	54.97	45.22	73.90

100%), the table indicates the average proportion of funds raised in relation to the initial target, the amount raised in relation to the total amount raised, the number of contributions as of date considered in relation to the final number of contributions, and the number of backers mobilised as of that date in relation to the final number of backers. These various figures are presented for the total sample, as well as for the subsamples of successful (S) and failed (F) campaigns.

**Regression analysis**

We now turn to multivariate analysis. Table 5 presents the estimations of the explanatory logit model for the success of campaigns. The results obtained are in line with our hypotheses, with the exception of *DEGREE*, which is found to be non-significant. At the beginning of a campaign, attracting backers with high *CLUSTERING* increases the likelihood of success, whereas attracting backers with high *BETWEENNESS* and *EIGENVALUE* decreases it. These effects are more marked if the period used to define the beginning of the campaign is 24 h or 1/10. A one unit increase in the *CLUSTERING* logarithm raises the probability of success by 0.198 points in the case of campaigns that receive contributions in the first 24 h. The presence of strong preference ties between early backers and other users favours successful fundraising, corroborating H1a.

The same change in the *BETWEENNESS* logarithm decreases the chances of success by 2.4 points in the case of contributions received during the first one-tenth of the campaign, while the same increase in the *EIGENVALUE* logarithm decreases the chances of success by 0.215 points in the case of contributions received during the first 24 h of the campaign. The presence of weak preference ties between the early

backers and other users does not favour successful fundraising, corroborating H2a.

Fundraising speed during the beginning of the campaign increases the probability of success for each point in the logarithm by 0.106 points for the first 24 h and by 0.194 points for the one-third of the total fundraising duration. This supports H5a.

The results relating to our control variables reveal that the lower the targets, the greater the chances of campaign success. This is also true for the campaign duration: the shorter it is, the greater the chances of success. Communication also increases the likelihood of success. As noted in the descriptive statistics section, campaigns run by companies or private individuals succeed less frequently. Some sectors favour campaign success, such as citizens and charity, film and video, music and theatre,<sup>14</sup> whereas comic books, craft goods and food, fashion and design, games, technology and the residual category reduce the likelihood of campaign success.

As shown in Table 6, the results are less conclusive for *DELTA*. Although in relation to the impact of the presence of strong preference ties, we find the same type of relationship as for *SUCCESS*, the impact of markers of weak preference ties is generally non-significant. *CLUSTERING* appears to influence it positively, supporting H1b. *BETWEENNESS* has a negative influence, corroborating H2b, but only for one-tenth. As with *SUCCESS*, a higher *SPEED* value is associated with a higher *DELTA* value, corroborating H5b.

Part of the effect of our explanatory variables comes from *SPEED*, which acts as a mediator. Table 7 presents the estimations of the effect of our explanatory variables on *SPEED*, which is then the dependent variable for regressions.

<sup>14</sup>. This result can be interpreted, in line with Shymko and Roulet (2017), as a form of peer recognition.

**Table 5.** Fundraising success (Logit model – SUCCESS)

VARIABLE	(1)	(2)	(3)	(4)	(5)
		24 h	One-tenth	One-sixth	One-third
<i>DEGREE</i>		1.398 (7.895)	0.497 (3.301)	0.609 (4.502)	0.320 (2.587)
<i>CLUSTERING</i>		0.198*** (0.209)	0.109*** (0.194)	0.075*** (0.208)	0.042** (0.238)
<i>BETWEENNESS</i>		-1.126 (9.429)	-2.377*** (6.657)	-1.595*** (5.886)	-0.749** (4.055)
<i>EIGENVALUE</i>		-0.215** (0.862)	-0.246** (0.991)	-0.260** (1.073)	-0.179* (1.232)
<i>SPEED</i>		0.106*** (0.0455)	0.156*** (0.0445)	0.176*** (0.0509)	0.194*** (0.0627)
<i>AMOUNT</i>	-0.136*** (0.0392)	-0.089*** (0.0570)	-0.057*** (0.0536)	-0.042*** (0.0558)	-0.025*** (0.0598)
<i>INFO</i>	0.201*** (0.0310)	0.148*** (0.0425)	0.113*** (0.0378)	0.095*** (0.0388)	0.068*** (0.0416)
<i>DURATION</i>	-0.044*** (0.0774)	0.019 (0.107)	-0.058*** (0.106)	-0.047*** (0.105)	-0.026*** (0.113)
Company	-0.018 (0.121)	-0.039** (0.169)	-0.036** (0.156)	-0.030** (0.160)	-0.030** (0.169)
Private individual	-0.116*** (0.0645)	-0.098*** (0.0891)	-0.099*** (0.0815)	-0.091*** (0.0846)	-0.078*** (0.0891)
Citizens and charity	0.036* (0.126)	0.063*** (0.177)	0.049*** (0.154)	0.049*** (0.158)	0.029* (0.170)
Childhood and education	-0.015 (0.203)	-0.020 (0.273)	0.0004 (0.251)	0.001 (0.254)	0.006 (0.291)
Comic books	-0.151*** (0.231)	-0.126*** (0.325)	-0.100*** (0.270)	-0.087*** (0.275)	-0.085*** (0.291)
Craft goods and food	-0.097*** (0.166)	-0.093*** (0.220)	-0.062** (0.204)	-0.049** (0.215)	-0.042* (0.241)
Fashion and design	-0.154*** (0.176)	-0.104*** (0.228)	-0.089*** (0.219)	-0.088*** (0.226)	-0.083*** (0.258)
Film and video	0.097*** (0.123)	0.100*** (0.170)	0.098*** (0.147)	0.087*** (0.150)	0.063*** (0.162)
Games	-0.251*** (0.196)	-0.223*** (0.275)	-0.165*** (0.256)	-0.145*** (0.265)	-0.129*** (0.297)
Heritage	0.101* (0.364)	0.016 (0.434)	0.052 (0.522)	0.032 (0.542)	0.016 (0.568)
Music	0.077*** (0.130)	0.066*** (0.178)	0.072*** (0.156)	0.067*** (0.161)	0.046*** (0.174)
Other projects	-0.220*** (0.243)	-0.165*** (0.311)	-0.135*** (0.279)	-0.119*** (0.291)	-0.091*** (0.332)
Publishing and newspapers	-0.034 (0.159)	0.016 (0.215)	0.011 (0.199)	0.003 (0.205)	-0.001 (0.219)
Sports	0.025 (0.151)	-0.010 (0.208)	0.024 (0.189)	0.024 (0.190)	0.017 (0.204)
Theatre	0.068*** (0.144)	0.101*** (0.206)	0.099*** (0.176)	0.088*** (0.180)	0.0596*** (0.194)

Table 5 continues on the next page →

**Table 5 (Continued).** Fundraising success (Logit model – SUCCESS)

VARIABLE	(1)	(2)	(3)	(4)	(5)
		24 h	One-tenth	One-sixth	One-third
Technology	-0.146*** (0.206)	-0.082** (0.282)	-0.043 (0.248)	-0.056** (0.249)	-0.056** (0.276)
Observations	9,382	6,324	8,364	8,688	8,923
Wald $\chi^2$	2,173.43***	1,509***	2,113***	2,193***	2,057***
Pseudo $R^2$	0.282	0.362	0.450	0.500	0.573
Mean VIF	1.79	1.90	1.90	1.93	1.94

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ ; robust standard error in parenthesis.

VIF, Variance Inflation Factor.

Contrary to our expectations, *DEGREE* is found to have a negative impact on *SPEED* (for the periods 1/6 and 1/3), which does not support H3, while *CLUSTERING* displayed a positive effect, affirming H3. This offers greater precision in our analysis: what allows for rapid mobilisation is not independently sharing preferences with many people but rather sharing them with individuals who belong to communities with homogeneous preferences.

*BETWEENNESS* and *EIGENVALUE* have a positive effect on *SPEED* when temporalities are taken into account and the beginning of the campaign is defined as longer (1/6 and 1/3). Attracting more backers who have weak preference ties with other users increases the speed of fundraising at the beginning of the campaign. This finding does not support H4. These are striking observations and encourage more in-depth analysis.

Table 8 displays the overall effect of our explanatory variables on *SUCCESS* and *DELTA*. The values presented correspond to the sum of their direct and indirect effects (via *SPEED*). For example, the first value +0.279 corresponds to a direct effect of +0.198 of *CLUSTERING* on *SUCCESS* and an indirect effect of +0.081 (effect of +0.106 of *SPEED* on *SUCCESS*, multiplied by the effect of +0.763 of *CLUSTERING* on *SPEED*). For this variable, the positive effect is confirmed.

Where the beginning of the campaign is set as 1/6 or 1/3, the *DEGREE* of early backers is ultimately associated with a lower final amount raised and with less chance of exceeding the target. The same dynamic – contrary to our hypotheses – is observed for these longest periods (1/6 and 1/3) for *BETWEENNESS* and *EIGENVALUE*. These increase fundraising success by increasing the fundraising speed at the beginning of the campaign. Mechanisms are beginning to emerge. Table 9 summarises the results and their implications for our hypotheses.

### Analysis of robustness tests

In order to ensure the reliability of our conclusions, we conducted a series of robustness tests. The first tests related to

fundraising speed at the beginning of the campaign, the importance of which we have seen for the final outcome. This speed can be high both due to a large number of backers and contributions or a high average amount of these contributions over the period considered. Therefore, we replaced our mediator variable with the values for these three items and replicated the analysis. Table 10 presents the estimations of the overall effects of our explanatory variables recalculated based on modified speeds. The values presented in bold correspond to cases where the effect described was primarily generated via the mediator variable. Those presented in italics correspond to cases where the effect described is mainly due to the direct effect of the explanatory variable.

The same broad trends are found in relation to *SPEED*. It appears to be more beneficial to target backers with high *CLUSTERING* and low *DEGREE*. The results from weak preference ties are more contrasted. Attracting backers in intermediary positions, and therefore with high *BETWEENNESS*, improves fundraising during the one-third of the campaign. The presence of backers linked to others with high *DEGREE* values (i.e., high *EIGENVALUE*) negatively affects the beginning of the campaign but has beneficial effects when the early period is defined as longer (1/6 and 1/3).

Our second series of robustness tests related to the fact that the position of early backers within the network is based on their previous campaign contributions. This means that the highlighted effects of associations may be due to more number of campaigns supported than the way in which these previous contributions overlap with those of other users. In order to test this assertion, for each campaign we calculated the total number of contributions made in the past to other campaigns by early backers. We then divided our sample into tertiles and replicated our tests on the first (the smallest values) and third (the largest values). Table 11 displays the overall effects of our explanatory variables based on these estimations. The results reveal that the variables primarily have an impact on campaigns, which early on attract people who have

**Table 6.** Position in relation to the targets set (log-log Ordinary Least Squares (OLS) model) – DELTA

Variables	(1)	(2)	(3)	(4)	(5)
		24 h	One-tenth	One-sixth	One-third
<i>DEGREE</i>		1.438 (1.626)	0.263 (0.739)	-0.183 (0.752)	-0.657 (0.608)
<i>CLUSTERING</i>		1.250*** (0.0879)	0.892*** (0.0639)	0.725*** (0.0573)	0.461*** (0.0466)
<i>BETWEENNESS</i>		-0.514 (3.158)	-3.630** (1.537)	-1.101 (1.081)	0.891 (0.759)
<i>EIGENVALUE</i>		-0.487 (0.389)	-0.432 (0.276)	-0.337 (0.270)	-0.203 (0.245)
<i>SPEED</i>		0.344*** (0.0118)	0.589*** (0.0111)	0.703*** (0.0108)	0.842*** (0.00921)
<i>AMOUNT</i>	-0.484*** (0.0141)	-0.322*** (0.0154)	-0.204*** (0.0125)	-0.147*** (0.0116)	-0.0706*** (0.00977)
<i>INFO</i>	0.671*** (0.0104)	0.471*** (0.0112)	0.357*** (0.00903)	0.298*** (0.00850)	0.202*** (0.00744)
<i>DURATION</i>	-0.118*** (0.0318)	0.103*** (0.0320)	-0.145*** (0.0265)	-0.0985*** (0.0238)	-0.0245 (0.0192)
Company	-0.0410 (0.0456)	-0.0340 (0.0447)	-0.103*** (0.0371)	-0.0988*** (0.0339)	-0.0944*** (0.0290)
Private individual	-0.332*** (0.0243)	-0.254*** (0.0242)	-0.279*** (0.0198)	-0.256*** (0.0184)	-0.208*** (0.0159)
Citizens and charity	0.114** (0.0526)	0.199*** (0.0514)	0.151*** (0.0400)	0.144*** (0.0369)	0.0682** (0.0318)
Childhood and education	-0.0310 (0.0848)	-0.0485 (0.0866)	-0.0180 (0.0684)	0.00563 (0.0619)	0.0187 (0.0536)
Comic books	-0.335*** (0.0907)	-0.231*** (0.0829)	-0.215*** (0.0646)	-0.205*** (0.0551)	-0.196*** (0.0452)
Craft goods and food	-0.239*** (0.0696)	-0.192*** (0.0688)	-0.112** (0.0547)	-0.0841* (0.0488)	-0.0857** (0.0423)
Fashion and design	-0.380*** (0.0788)	-0.226*** (0.0784)	-0.189*** (0.0579)	-0.170*** (0.0508)	-0.146*** (0.0434)
Film and video	0.241*** (0.0499)	0.231*** (0.0485)	0.237*** (0.0372)	0.214*** (0.0341)	0.141*** (0.0296)
Games	-0.648*** (0.0794)	-0.452*** (0.0767)	-0.400*** (0.0601)	-0.343*** (0.0546)	-0.275*** (0.0455)
Heritage	0.523*** (0.147)	0.209 (0.130)	0.280** (0.110)	0.218** (0.0981)	0.163** (0.0827)
Music	0.176*** (0.0532)	0.172*** (0.0510)	0.136*** (0.0395)	0.111*** (0.0362)	0.0557* (0.0314)
Other projects	-0.540*** (0.109)	-0.450*** (0.121)	-0.315*** (0.0848)	-0.283*** (0.0746)	-0.241*** (0.0618)
Publishing and newspapers	-0.117* (0.0664)	0.0440 (0.0625)	0.000273 (0.0485)	-0.00811 (0.0447)	-0.0348 (0.0381)
Sports	0.0974 (0.0661)	-0.0395 (0.0658)	0.0603 (0.0519)	0.0649 (0.0469)	0.0241 (0.0396)
Theatre	0.184***	0.259***	0.283***	0.266***	0.171***

Table 6 continues on the next page →

**Table 6 (Continued).** Position in relation to the targets set (log-log OLS model) – DELTA

Variables	(1)	(2)	(3)	(4)	(5)
		24 h	One-tenth	One-sixth	One-third
Technology	(0.0587) −0.442***	(0.0591) −0.298***	(0.0457) −0.199***	(0.0423) −0.206***	(0.0371) −0.174***
Constant	(0.0866) 6.902***	(0.0888) 3.930***	(0.0707) 3.494***	(0.0623) 2.593***	(0.0513) 1.387***
Observations	(0.120) 9,382	(0.148) 6,324	(0.116) 8,364	(0.110) 8,688	(0.0960) 8,923
Adjusted R <sup>2</sup>	0.376	0.483	0.606	0.670	0.761
Fisher	290.64***	183.22***	428.03***	609.4***	1,075***
Mean VIF	1.79	1.90	1.90	1.93	1.94

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ ; robust standard error in parenthesis.

VIF, Variance Inflator Factor.

made few contributions in the past. The findings are more often statistically significant for the sample in the first tertile than in the third.

## Discussion

### Contributions

These results build on the literature on the determining factors underpinning the success of crowdfunding campaigns. They move beyond the configuration of fundraising appeals and specify, following on from Colombo et al. (2015), the conditions for establishing the virtuous dynamic that is typical of those who successfully reach their target. They reveal the existence of a particular interplay between the shared preferences of early backers and other platform users that can render effective the signal sent out by the support offered. The presence of strong preference ties, characteristic of involvement in communities, appears to be crucial when it comes to attracting the attention of users in a position in order to evaluate the appeal and relevance of the project being funded. This observation is valid regardless of the duration considered to mark the beginning of the campaign. The presence of weak preference ties, characteristic of an intermediary position between communities, also appears to be important for campaign success, but at a later stage and via an indirect mechanism that leads to an increase in the early fundraising speed. These ties attract the attention of other users – more numerous albeit less motivated – who rely on their predecessors when assessing the appeal of the project.

We are talking about a precursor or follower-type mechanism comparable with that described in models for the diffusion of innovative products inspired by Bass (1969). Early backers are like pioneers. They are highly motivated by the success of the project and provide both moral and financial

support (Ellis, 2011; Dominguez et al., 2017). If they hold a central position in the area in question, their visibility, status and resources (Croidieu & Rüling, 2017) make their commitment inspirational for a class of users who are less invested but greater in number. It is these users who establish the bridge between the pioneers and the mass of other potential backers (Vasudeva et al., 2018).

This study also contributes to our understanding of the way in which the involvement of the project initiator's friends and family (Cordova et al., 2015; Mollick, 2014; Mollick & Nanda, 2015), and that of users who regularly support campaigns on the platform (Butticè et al., 2017), can produce a bandwagon effect. These key individuals share positive orientations in favour of the values supported by the campaign (Calic & Mosakowski, 2016), which can be described as strong shared preferences established on an effective basis or through shared interests.

We also propose a series of tools that can be used to describe the relationships between current and potential backers without the knowledge of anything other than their past behaviour on the platform. We use these to infer the importance of the strong or weak preference ties between them and observe their effects on campaign success. This is done via modelling that takes the form of a network and indicators, representing the topology of the network based on individuals identified as important, that is, early backers. We use the mean values for clustering and betweenness in the *de facto* group to obtain a measure of the impact of typical configurations of shared preferences and their interplay on the platform with a view of explaining the success of campaigns.

### Implications

In theoretical terms, the results of this study open up new perspectives in the study of the mechanisms associated with

**Table 7.** Fundraising speed at the beginning of the campaign (log-log OLS model – SPEED)

Variables	(1)	(2)	(3)	(4)
	24 h	One tenth	One sixth	One third
<i>DEGREE</i>	-0.378 (1.607)	-1.322 (1.110)	-3.470*** (0.948)	-3.432*** (0.802)
<i>CLUSTERING</i>	0.763*** (0.0538)	1.262*** (0.0488)	1.423*** (0.0503)	1.607*** (0.0533)
<i>BETWEENNESS</i>	1.807 (3.321)	0.283 (1.721)	2.411* (1.344)	4.747*** (1.187)
<i>EIGENVALUE</i>	0.508 (0.435)	0.695 (0.493)	0.913** (0.382)	0.544 (0.368)
AMOUNT	-0.444*** (0.0151)	-0.479*** (0.0134)	-0.497*** (0.0128)	-0.514*** (0.0125)
INFO	0.227*** (0.0107)	0.373*** (0.00938)	0.405*** (0.00904)	0.455*** (0.00884)
DURATION	-0.335*** (0.0369)	0.105*** (0.0304)	0.0727** (0.0285)	-0.00460 (0.0269)
Company	0.196*** (0.0476)	0.181*** (0.0422)	0.150*** (0.0414)	0.123*** (0.0393)
Private individual	-0.00655 (0.0255)	-0.0184 (0.0221)	-0.0519** (0.0213)	-0.113*** (0.0208)
Citizens and charity	-0.193*** (0.0542)	-0.0793* (0.0478)	-0.0316 (0.0459)	0.0268 (0.0446)
Childhood and education	-0.242*** (0.0843)	-0.153** (0.0754)	-0.133* (0.0721)	-0.179** (0.0739)
Comic books	0.0906 (0.0914)	-0.0387 (0.0830)	-0.0411 (0.0803)	-0.0825 (0.0779)
Craft goods and food	-0.188*** (0.0703)	-0.207*** (0.0612)	-0.175*** (0.0596)	-0.180*** (0.0596)
Fashion and design	-0.125 (0.0772)	-0.132* (0.0684)	-0.148** (0.0650)	-0.172*** (0.0642)
Film and video	-0.0738 (0.0511)	-0.00589 (0.0453)	0.0357 (0.0435)	0.0801* (0.0423)
Games	-0.0285 (0.0821)	-0.201*** (0.0728)	-0.262*** (0.0707)	-0.344*** (0.0684)
Heritage	0.0293 (0.214)	0.330* (0.187)	0.364** (0.168)	0.325** (0.148)
Music	-0.0366 (0.0547)	0.0400 (0.0483)	0.0783* (0.0462)	0.0864* (0.0451)
Other projects	-0.375*** (0.0824)	-0.336*** (0.0825)	-0.328*** (0.0815)	-0.373*** (0.0871)
Publishing and newspapers	-0.151** (0.0644)	-0.0166 (0.0594)	-0.0291 (0.0579)	-0.0448 (0.0569)
Sports	0.185*** (0.0676)	0.0689 (0.0577)	0.0587 (0.0554)	0.0527 (0.0548)
Theatre	-0.192*** (0.0606)	-0.120** (0.0530)	-0.0676 (0.0511)	0.00537 (0.0498)
Technology	-0.273*** (0.0951)	-0.231*** (0.0829)	-0.180** (0.0752)	-0.196*** (0.0726)

Table 7 continues on the next page →

**Table 7 (Continued).** Fundraising speed at the beginning of the campaign (log-log OLS model – SPEED)

Variables	(1)	(2)	(3)	(4)
	24 h	One tenth	One sixth	One third
Constant	5.495*** (0.133)	4.260*** (0.116)	4.635*** (0.111)	5.240*** (0.108)
Observations	6,324	8,364	8,688	8,923
Adjusted R <sup>2</sup>	0.254	0.311	0.354	0.407
Fisher	99.22***	180.7***	222.8***	276.0***
Mean VIF	1.90	1.89	1.91	1.91

\*\*\**p* < 0.01, \*\**p* < 0.05, \**p* < 0.1; robust standard error in parenthesis.

VIF, Variance Inflator Factor.

**Table 8.** Overall effects of explanatory variables

Variables	First part of campaign duration							
	24 h		One-tenth		One-sixth		One-third	
	SUCCESS	DELTA	SUCCESS	DELTA	SUCCESS	DELTA	SUCCESS	DELTA
<i>DEGREE</i>	NS	NS	NS	NS	-0.002	-2.256	-0.346	-2.233
<i>CLUSTERING</i>	0.279	1.512	0.306	1.635	0.325	1.725	0.354	1.814
<i>BETWEENNESS</i>	NS	NS	-2.333	-3.463	-1.171	0.594	0.172	4.888
<i>EIGENVALUE</i>	-0.161	NS	-0.138	NS	-0.099	0.979	-0.073	NS

**Table 9.** Summary of hypotheses and test results

Hypotheses	Explanatory variables	Anticipated effects and results for SUCCESS	Anticipated effects and results for DELTA	Anticipated effects and results for SPEED
H1a, H1b and H3	<i>DEGREE</i> <i>CLUSTERING</i>	+ Non-significant + Corroborated	+ Non-significant + Corroborated	+ Not corroborated for 1/6 or 1/3 + Corroborated
H2a, H2b and H4	<i>BETWEENNESS</i> <i>EIGENVALUE</i>	- Corroborated - Corroborated	- Corroborated for 1/10 - Non-significant	- Not corroborated for 1/6 or 1/3 - Not corroborated for 1/6 or 1/3
H5a and H5b	<i>SPEED</i>	+ Corroborated	+ Corroborated	

crowdfunding, but also more broadly the markets on which the interpersonal dimension is important for establishing exchanges, namely, matching markets. They offer a new angle to consider studies that have highlighted the bandwagon effect generated at the beginning of a successful campaign. Research studies on establishing forms of solidarity and reciprocity between project initiators that studies the internal social capital on the platform (Colombo et al., 2015), as well as on the involvement of backers that regularly support campaigns (Butticé et al., 2017), shed light on how the desired dynamic is triggered. These studies can be read in terms of groups of individuals linked by strong shared preferences. Users launch campaigns and mainly support those in areas of interest to them, in other words, those for which they have preferences. Project initiators, therefore, share preferences with other project initiators they have supported in the past, just as they share preferences with others who have supported the same campaigns.

Individuals who regularly contribute to campaigns also share preferences with the project initiators being funded and with other backers committed to the same campaigns.

The results of this study also open up new questions that need to be addressed. By emphasising the role of groups of individuals with strong preference ties, that is, communities of preferences, they point to the need for a better understanding of the composition of these communities and of the ways in which they are formed, activated and mobilised to serve a campaign's purpose. What role is played by those close to project initiators? Are some individuals more important than others within the community? What about the role of serial backers? Furthermore, we have shown that when considering early campaign periods longer than 1/10 (1/6 and 1/3), the presence of weak preference ties also favours campaign's success (indirectly via fundraising speed). A kind of sequence is, therefore, established, and it would be interesting to better



**Table 10.** Overall effects of explanatory variables

Variables	First part of campaign duration							
	24 h		One tenth		One sixth		One third	
	SUCCESS	DELTA	SUCCESS	DELTA	SUCCESS	DELTA	SUCCESS	DELTA
<i>Number of backers</i>								
DEGREE	NS	NS	NS	NS	-0,457	-1,446	-0,627	-3,548
CLUSTERING	0.276	1.512	0.310	1.634	0.332	1.725	0.355	1.814
BETWEENNESS	NS	NS	-2.429	-1.752	<b>-1.054</b>	NS	NS	<b>-0.636</b>
EIGENVALUE	-0.127	0.259	-0.043	-0.023	0.034	0.850	0.260	0.255
<i>Number of contributions</i>								
DEGREE	NS	NS	0.214	-1.206	-0.817	-2.549	-0.491	-3.837
CLUSTERING	0.274	1.624	0.299	1.634	0.294	1.725	0.316	1.814
BETWEENNESS	NS	NS	-2.408	-1.151	<b>-1.333</b>	NS	0.068	4.890
EIGENVALUE	-0.118	0.314	-0.042	-0.023	0.020	0.304	0.037	0.225
<i>Average contributions</i>								
DEGREE	-0.227	-0.946	-0.245	-1.026	-0.399	-1.690	-0.393	-3.548
CLUSTERING	0.285	1.512	0.342	1.634	0.366	1.725	0.401	1.814
BETWEENNESS	0.498	2.068	-2.029	-3.463	-0.916	2.594	0.843	3.564
EIGENVALUE	<b>-0.219</b>	NS	-0.082	-0.342	NS	NS	-0.073	-0.311

The values presented in bold correspond to cases where the effect described was primarily generated via the mediator variable. Those presented in italics correspond to cases where the effect described is mainly due to the direct effect of the explanatory variable.

**Table 11.** Overall effects of explanatory variables

Variables	First part of campaign duration							
	24 h		One-tenth		One-sixth		One-third	
	SUCCESS	DELTA	SUCCESS	DELTA	SUCCESS	DELTA	SUCCESS	DELTA
<i>First tertile</i>								
DEGREE	1.650	14.522	<b>1.601</b>	<b>2.655</b>	1.827	-1.001	-0.410	-0.891
CLUSTERING	0.300	1.586	0.272	1.332	0.262	1.333	0.254	1.323
BETWEENNESS	NS	NS	-2.799	-2.179	-3.174	-0.826	1.222	5.417
EIGENVALUE	-1.810	-0.668	-0.760	-1.638	<b>-0.910</b>	NS	NS	NS
<i>3<sup>rd</sup> tertile</i>								
DEGREE	NS	NS	NS	NS	NS	<b>-2.228</b>	NS	NS
CLUSTERING	0.173	1.203	0.031	0.118	0.029	0.129	NS	NS
BETWEENNESS	NS	NS	NS	NS	NS	NS	NS	NS
EIGENVALUE	<b>-0.191</b>	NS	0.170	0.650	0.121	0.528	-0.073	0.406

The values presented in bold correspond to cases where the effect described was primarily generated via the mediator variable. Those presented in italics correspond to cases where the effect described is mainly due to the direct effect of the explanatory variable.

understand the mechanics behind it and above all its temporality. After what time lapse does it become beneficial to attract backers with weak preference ties?

From a general perspective, the method developed herein opens up new possibilities for the study of matching markets. On these markets, prices – when they exist – are no more than secondary elements in establishing transactions. It is difficult to infer from them agents' preferences, which more than ever are unobservable. However, as we have done, it is

possible to work on the basis of signals that are characteristics of shared preferences. By identifying the way in which preference sharing is organised between individuals, we can obtain empirical information that helps us to better understand the equilibria that form on a market. So, for example, it would be possible to identify which groups to prioritise, those who most frequently see their preferences satisfied, or the least attractive groups, those who struggle to find adequate recompense to satisfy their preferences. In the absence of information

asymmetry, the Gale–Shapley allocation algorithm shows that those who are prioritised are the most solicited, and that, regardless of how market sequences begin, the same individuals are always left by the wayside. These predictions could be evaluated on more complex markets, such as crowdfunding.

This research study also offers several pieces of advice for the managers of platforms, as well as project initiators. For the former, it is recommended to make campaigns more visible to users who share strong preference ties with the very earliest backers before expanding their communication. This facilitates the conclusion of transactions and, therefore, reduces congestion problems. The result is greater efficiency in the allocation of resources through the intermediary of the platform. More mutually profitable transactions can likely be generated through a system of recommendations and/or simply by displaying the campaign more clearly on the page. The aim should be to prioritise, at the very beginning of the campaign, backers with strong shared preferences who are involved in communities (with high clustering) marked by transitive relations rather than simply a high number of individuals. Then, once the campaign moves beyond one-tenth of the total fundraising period, it is advantageous to reorient communication with a view of mobilising those with weak preference ties (high betweenness), who serve as intermediaries between communities. We can see, therefore, that there is a progression over the duration of the campaign in terms of the potential backers to convince, beginning with those who have knowledge of the area, followed by those with eclectic preferences and, finally, the 'wider public' (the 'crowd' of potentially interested backers).

### Limitations

This research study, nonetheless, includes certain limitations. Firstly, it studies a single platform, Ulule, which has its own operating rules and targets a particular audience. Its campaigns are based on the 'all or nothing' principle and they nearly all target and are run by people in France, and relate to a limited range of activities (primarily with a creative dimension). It could be useful to replicate our tests on other platforms and/or in other crowdfunding sectors. Are strong preference ties at the beginning of a campaign as important if the personal dimension of the matches generated is more or less important? On equity crowdfunding or lending crowdfunding platforms, where campaigns involve more standard rewards (prospect of capital gains or future dividends, payment of interest, etc.) and where the parties' motivations are less altruistic, the structure of the network may be different. Weak preference ties of early backers that allow a greater number of users to be reached may be more important in ensuring the success of such campaigns. Conversely, it is likely that on platforms more oriented towards donations (or interest-free loans), strong preference ties play an even more crucial role.

Another limitation relates to the calculation intensity of the methods adopted. As the network of shared preferences between users increases, and therefore, as the platform develops, the number of calculations needed to obtain the indicators used to group together the types of ties established also increases and does so exponentially. We faced what mathematicians call the 'curse of dimensionality'. We resolved this difficulty by limiting the sliding window for determining the ties established to 9 months. This time lapse is sufficient to take into account any short-term fad that might affect both supply (type of campaigns) and demand (expectations of potential backers) on the platform but without saturating our data-processing capacities. While we believe that this choice was an acceptable compromise that in no way undermined the reliability of our conclusions, it may be useful in more restricted sectors to observe how a longer or shorter time lapse would affect the creation of strong or weak ties, or even to monitor an emerging area on a platform to see how they are established gradually. The question of the disappearance of these ties also merits significant attention. How can it be characterized? After how much time does it come about? What are its effects? And setting these questions could help better calibrate the method for characterising strong or weak preference ties and limit the difficulties associated with the amount of information to be processed.

### Conclusion

This research study looks at the determining factors of the success of crowdfunding campaigns. It tests the impact of the way in which the shared preferences of early backers and other platform users interact with a view of explaining campaign success. In so doing, we show that the more this interaction takes the form of strong preference ties, the more campaigns succeed. The presence of weak preference ties also has a positive effect, but indirectly and only when longer periods are considered as the beginning of the campaign (1/6 and 1/3 of the overall duration). It is associated with an increase in fundraising speed at the beginning of the campaign, which, in turn, contributes to a favourable final outcome.

The research study was conducted based on data from the first 52 months' activities on the Ulule platform, affording a sizable sample of 9,415 campaigns. On a monthly basis, we graphed the network of shared preferences between backers, whereby a link was considered to have been established between two individuals when they had both taken part in the same campaign. For each active user over the last 9 months, this allowed us to establish a series of measures that shed light on the interplay between that user's preferences and those of others. These series include two types: the first, degree and clustering, account for local entanglement and, therefore, indicate the presence of strong preference ties; the second,

betweenness and eigenvalue centrality, account for an intermediate position occupied by the backers concerned and, therefore, indicate the presence of weak preference ties. For the group defined as early campaign backers, the means of their respective values 1 month before the campaign launch constitute our explanatory variables.

As a whole, the results of this study point to future research avenues in terms of both understanding how crowdfunding works and, more generally, markets that operate with a significant interpersonal dimension (matching markets). The method developed herein offers a new approach to the preferences of those on the demand side (which can be transposed to those on the supply side of markets who choose their own clients). By deciding not to make inferences from commitments made individually and, instead, to focus on shared commitments in groups of agents, this method invites the observer to take into account social interactions in the study of allocation processes. This allows us to better understand their role in the coming together of supply and demand, particularly in the context of negotiations for new goods and services in markets that suffer from problems of information asymmetry, as well as those with congestion problems. Preference ties are useful conceptual instruments that shed light on the bandwagon and commitment phenomena among groups of individuals on markets where preferences are not limited simply to value for money and where the personality of stakeholders plays an important role. It would, therefore, be useful to replicate the type of analysis that we have just presented in the context, in which the importance of this interpersonal dimension differs from that of reward crowdfunding (equity crowdfunding, lending crowdfunding or donation crowdfunding) or over periods during which the importance of this dimension varies for exogenous reasons (after a crisis that makes users more sensitive towards others or following the launch of more standard types of contribution).

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## References

- Afriat, S. (1967). The construction of a utility function from expenditure data. *International Economic Review*, 8(1), 67–77. doi: 10.2307/2525382
- Agrawal, A., Catalini, C. & Goldfarb, A. (2014). Some simple economics of crowdfunding. *Innovation Policy and the Economy*, 14(1), 63–97. doi: 10.1086/674021
- Agrawal, A., Catalini, C. & Goldfarb, A. (2015). Crowdfunding: Geography, social networks, and the timing of investment decisions. *Journal of Economics and Management Strategy*, 24(2), 253–274. doi: 10.1111/jems.12093
- Allison, T., Davis, B., Short, J. & Webb, J. (2015). Crowdfunding in a prosocial microlending environment: Examining the role of intrinsic versus extrinsic cues. *Entrepreneurship Theory and Practice*, 39(1), 53–73. doi: 10.1111/etap.12108
- Allmayer, S. & Winkler, H. (2013). Interface management research in supplier-customer relationships: Findings from a citation analysis of international literature. *Journal of Business Economics*, 83(9), 1015–1061. doi: 10.1007/s11573-013-0685-1
- Bass, F. (1969). A new product growth model for consumer durables. *Management Science*, 15(5), 215–227. doi: 10.1287/mnsc.15.5.215
- Belleflamme, P., Lambert, T. & Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, 29(5), 585–609. doi: 10.1016/j.jbusvent.2013.07.003
- Beshears, J., Choi, J., Laibson, D. & Madrian, B. (2008). How are preferences revealed? *Journal of Public Economics*, 92(8–9), 1787–1794. doi: 10.1016/j.jpubeco.2008.04.010
- Bœuf, B., Darveau, J. & Legoux, R. (2014). Financing creativity: Crowdfunding as a new approach for theatre projects. *International Journal of Arts Management*, 16(3), 33–48.
- Bommarito II, M., Katz, D., Zelner, J. & Fowler, H. (2010). Distance measures for dynamic citation networks. *Physica A: Statistical Mechanics and its Applications*, 389(19), 4201–4208. doi: 10.1016/j.physa.2010.06.003
- Bruton, G., Khavul, S., Siegel, D. & Wright, M. (2015). New financial alternatives in seeding entrepreneurship: Microfinance, crowdfunding, and peer-to-peer innovations. *Entrepreneurship Theory and Practice*, 39(1), 9–26. doi: 10.1111/etap.12143
- Burt, R. (1980). Models of network structure. *Annual Reviews of Sociology*, 6(1), 79–141. doi: 10.1146/annurev.so.06.080180.000455
- Burt, R. (1992). *Structural holes: The structure of social capital competition*. Cambridge Harvard University Press.
- Burt, R. (2004). Structural holes and good ideas. *American Journal of Sociology*, 110(2), 349–399. doi: 10.1086/421787
- Butticè, V., Colombo, G. M. & Wright, M. (2017). Serial crowdfunding, social capital, and project success. *Entrepreneurship Theory and Practice*, 41(2), 183–207. doi: 10.1111/etap.12271
- Calic, G. & Mosakowski, E. (2016). Kicking off social entrepreneurship: How a sustainability orientation influences crowdfunding success. *Journal of Management Studies*, 53(5), 738–767. doi: 10.1111/joms.12201
- Chiong, K. (2015). *Essays in social and economic network*. Dissertation thesis. Caltech University.
- Cholakova, M. & Clarysse, B. (2015). Does the possibility to make equity investments in crowdfunding projects crowd out reward-based investments? *Entrepreneurship Theory and Practice*, 39(1), 145–172. doi: 10.1111/etap.12139
- Colombo, M., 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. doi: 10.1111/etap.12118
- Connelly, B. L., Certo, S. T., Ireland, R. D. & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, 37, 39–67. doi: 10.1177/0149206310388419
- Cordova, A., Dolci, J. & Gianfrate, G. (2015). The determinants of crowdfunding success: Evidence from technology projects. *Procedia – Social and Behavioral Sciences*, 181, 115–124. doi: 10.1016/j.sbspro.2015.04.872
- Crawford, I. & De Rock, B. (2014). Empirical revealed preference. *Annual Review of Economics*, 6, 503–524. doi: 10.1146/annurev-economics-080213-041238

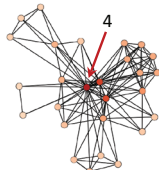
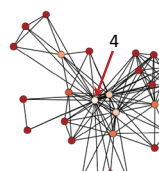
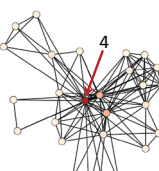
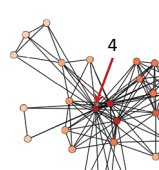
- Croidieu, G. & Rüling, C. C. (2017). Complex field-positions and non-imitation: Pioneers, strangers, and insulars in Australian fine-wine. *M@n@gement*, 20(2), 129–165. doi: 10.3917/mana.202.0129
- Cumming, D., Leboeuf, G. & Schwienbacher, A. (2020). Crowdfunding models: Keep-it-all vs all-or-nothing. *Financial Management*, 49(2), 331–360. doi: 10.1111/fima.12262
- De Larquier, G. (1997). Principes des marchés régis par appariement. *Revue Economique*, 48(6), 1409–1438. doi: 10.3406/reco.1997.409947
- De Paula, A., Richards-Shubik, S. & Tamer, E. (2018). Identifying preferences in networks with bounded degree. *Econometrica*, 86(1), 263–288. doi: 10.3982/ECTA13564
- De Solla Price, D. (1965). Networks of scientific papers. *Science*, 149, 510–515. doi: 10.1126/science.149.3683.510
- Dominguez, N., Mayrhofer, U. & Obadia, C. (2017). The antecedents of information exchange in export business networks. *M@n@gement*, 20(5), 463–491. doi: 10.3917/mana.205.0463
- Du, Z., Li, M. & Wang, K. (2019). The more options, the better? Investigating the impact of the number of options on backers' decisions in reward-based crowdfunding projects. *Information & Management*, 56, 429–444. doi: 10.1016/j.im.2018.08.003
- Dubois, S. & Walsh, I. (2017). The globalization of research highlighted through the research networks of management education institutions: The case of French business schools. *M@n@gement*, 20(5), 435–462. doi: 10.3917/mana.205.0435
- Ellis, P. D. (2011). Social ties and international entrepreneurship: Opportunities and constraints affecting firm internationalization. *Journal of International Business Studies*, 42(1), 99–127. doi: 10.1057/jibs.2010.20
- Ferrary, M. (2001). Pour une théorie de l'échange dans les réseaux sociaux. *Cahiers Internationaux de Sociologie*, 2, 261–290. doi: 10.3917/cis.111.0261
- Gee, L., Jones, J., Fariss, C., Burke, M. & Fowler, J. (2017). The paradox of weak ties in 55 countries. *Journal of Economic Behavior & Organization*, 133(1), 362–372. doi: 10.1016/j.jebo.2016.12.004
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360–1380. doi: 10.1086/225469
- Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *American Sociological Theory*, 1(6), 201–233. doi: 10.2307/202051
- Granovetter, M. (1995). *Getting a job: A study of contacts and careers*. The University of Chicago Press Book.
- Greenberg, J. & Mollick, E. (2017). Activist choice homophily and crowdfunding of female founders. *Administrative Science Quarterly*, 62(2), 341–374. doi: 10.1177/0001839216678847
- Hakenes, H. & Schlegel, F. (2014). *Exploiting the financial wisdom of the crowd – Crowdfunding as a tool to aggregate vague information*. Working Paper, SSRN. Retrieved from <https://ssrn.com/abstract=2475025>
- Halaburda, H., Piskorski, M. & Yildirim, P. (2018). Competing by restricting choice: The case of search platforms. *Management Science*, 64(8), 3574–3594. doi: 10.1287/mnsc.2017.2797
- Heider, F. (1946). Attitudes and cognitive organization. *The Journal of Psychology*, 21(1), 107–112. doi: 10.1080/00223980.1946.9917275
- Houthakker, H. S. (1950). Revealed preference and the utility function. *Economica*, 17, 159–174. doi: 10.2307/2549382
- Hu, Y. (2006). Efficient and high-quality force-directed graph drawing. *The Mathematics Journal*, 10(1), 37–71.
- Jackson, M. (2008). *Social and economic networks*. Princeton Press.
- Kim, P. H., Buffart, M. & Croidieu, G. (2016). TMI: Signaling credible claims in crowdfunding campaign narratives. *Group & Organization Management*, 41(6), 717–750. doi: 10.1177/1059601116651181
- Kuppaswamy, V. & Bayus, B. (2017). Does my contribution matter? An analysis of the kickstarter crowdfunding community. *Journal of Business Venturing*, 32(1), 72–89. doi: 10.1016/j.jbusvent.2016.10.004
- Lin, N. (2001). *Social capital: A theory of social structure and action*. Cambridge University Press.
- Mayer, A. (2012). The structure of social networks and labour market success. *Applied Economics Letters*, 19(13), 1271–1274. doi: 10.1080/13504851.2011.619484
- Medo, M. (2013). Network-based information: Itering algorithms ranking and recommendation. In A. Mukherjee et al. (Eds.), *Dynamics on and of complex networks* (Vol. 2, pp. 315–334). Birkhäuser.
- Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29(1), 1–16. doi: 10.1016/j.jbusvent.2013.06.005
- Mollick, E. & Nanda, R. (2015). Wisdom or madness? Comparing crowds with expert evaluation in funding the arts. *Management Science*, 62(6), 1533–1553. doi: 10.1287/mnsc.2015.2207
- Mongin, P. (2000). Les préférences révélées et la formation de la théorie du consommateur. *Revue Economique*, 51(5), 1125–1152. doi: 10.3406/reco.2000.410576
- Moureau, N. & Vidal, M. (2009). Quand préférences déclarées et révélées s'opposent : le téléspectateur, un cas paradoxal pour l'économiste. *Revue Française de Socio-Économie*, 2(4), 199–218. doi: 10.3917/rfse.004.0199
- Newman, M. (2001a). Scientific collaboration networks. I. Network construction and fundamental results. *Physical Review E*, 64(1), 016131, 1–8. doi: 10.1103/PhysRevE.64.016131
- Newman, M. (2001b). Scientific collaboration networks. II. Shortest paths, weighted networks and centrality. *Physical Review E*, 64(1), 016132, 1–7. doi: 10.1103/PhysRevE.64.016132
- Ordanini, A., Miceli, L., Pizzetti, M. & Parasuraman, A. (2011). Crowdfunding: Transforming customers into investors through innovative service platforms. *Journal of Service Management*, 22(4), 443–470. doi: 10.1108/09564231111155079
- Petitjean, M. (2018). What explains the success of reward-based crowdfunding campaigns as they unfold? Evidence from the French crowdfunding platform KissKissBankBank. *Finance Research Letters*, 26, 9–14. doi: 10.1016/j.frl.2017.11.005
- Pinski, G. & Narin, F. (1976). Citation influence of journal aggregates of scientific publications: Theory, with application to the literature of physics. *Information Processing and Management*, 12(5), 297–312. doi: 10.1016/0306-4573(76)90048-0
- Roth, A. & Sotomayor, M. (1992). Two-sided matching. In R. Aumann & S. Hart (Eds.), *Handbook of game theory* (Vol. 1, pp. 485–541). Elsevier.
- Statista (2019). Market size of crowdfunding worldwide in 2019 and 2026 (in billion U.S. dollars). *Crowdfunding*.
- Samuelson, P. A. (1938). A note on the pure theory of consumer's behaviour. *Economica*, 5, 61–71. doi: 10.2307/2548836
- Samuelson, P. A. (1948). Consumption Theory in terms of revealed Preference. *Economica*, 15(60), 243–253. doi: 10.2307/2549561
- Sanders, W. G. & Boivie, S. (2004). Sorting things out: Valuation of new firms in uncertain markets. *Strategic Management Journal*, 25, 167–186. doi: 10.1002/smj.370
- Short, J. C., Ketchen, D. J., Jr., McKenny, A. F., Allison, T. H. et al. (2017). Research on crowdfunding: Reviewing the (very recent) past and celebrating the present. *Entrepreneurship Theory and Practice*, 41(2), 149–160. doi: 10.1111/etap.12270
- Shymko, Y. & Roulet, T. J. (2017). When does Medici hurt da Vinci? Mitigating the signaling effect of extraneous stakeholder relationships in the field of cultural production. *Academy of Management Journal*, 60(4), 1307–1338. doi: 10.5465/amj.2015.0464

- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87, 355–374. doi: 10.2307/1882010
- Stiglitz, J.E. (2000). The contributions of the economics of information to twentieth century economics. *Quarterly Journal of Economics*, 115, 1441–1478. doi: 10.1162/003355300555015
- Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42(1), 35–67. doi: 10.2307/2393808
- Varian, H. (2006). Revealed preference. In M. Szenberg, L. Ramrattan A. & A. Gottesman (Eds.), *Samuelsonian economics and the twenty-first century* (pp. 99–115). Oxford University Press.
- Vasudeva, G., Nachum, L. & Say, G. D. (2018). A signaling theory of institutional activism: How Norway's sovereign wealth fund investments affect firms' foreign acquisitions. *Academy of Management Journal*, 61(4), 1583–1611. doi: 10.5465/amj.2015.1141
- Yu, F., Zeng, A., Gillard, S. & Medo, M. (2016). Network-based recommendation algorithms: A review. *Physica A: Mechanics and its Applications*, 452(15), 192–208. doi: 10.1016/j.physa.2016.02.021
- Zheng, H., Li, D., Wu, J. & Xu, Y. (2014). The role of multidimensional social capital in crowdfunding: A comparative study in China and US. *Information & Management*, 51(4), 488–496. doi: 10.1016/j.im.2014.03.003

## Appendix 1. Selection of observations chosen for the study

Phase	Actions	Observations	Dates covered
1	The Ulule platform released a database containing detailed information on its campaigns (whether successful) and the contributions made	Projects: 37,464 Contributions: 1,041,178	July 2010–April 2016 (71 months)
2	Project database filtered: <ul style="list-style-type: none"> <li>campaigns put online</li> <li>campaigns completed</li> </ul>	Projects: 19,630	July 2010–April 2016 (71 months)
3	Contribution database filtered: <ul style="list-style-type: none"> <li>contributions with the amount provided</li> <li>contributions for which the backer's user name is available</li> </ul>	Contributions: 1,018,028	July 2010–April 2016 (71 months)
4	Calculating network variables: <ul style="list-style-type: none"> <li>The incidence matrices (backers or projects) became too large to be processed from August 2015 onwards</li> <li>The calculation time needed to determine the values of the variables resulted in the database being limited to September 2014</li> <li>The variables could not be calculated for month 1</li> </ul>	Projects: 10,439	July 2010–September 2014 (52 months)
5	Data cleaning: <ul style="list-style-type: none"> <li>Campaign target provided and different to 0</li> <li>List of contributions provided</li> <li>Sum of contributions equal to the amount raised</li> <li>Number of backers' prior contributions available</li> </ul>	Projects: 9,425	July 2010–September 2014 (52 months)

## Appendix 2. Topological measures used

Definition	Figures	Comments
<p><b>DEGREE</b></p> <p>Degree centrality: the number of direct ties established between a node and other nodes.</p> <p>Normalised degree centrality: degree centrality in relation to the total number of nodes in the network.</p>		<p>Here, one node stands out: user 4. He or she has at least once supported the same campaigns as 26 other users. Attracting his or her interest by satisfying his or her preferences generates a high likelihood that the preferences will also be satisfied of the 26 others who financed the same campaigns in the past.</p>
<p><b>CLUSTERING</b></p> <p>Clustering (CL) coefficient: the ratio between the number of triangles (group of three nodes linked two by two) whose apex is the node in question and the total number of triangles that could form around it.</p>		<p>We can see that it is the peripheral nodes belonging to cliques that present the highest values. User 4 this time has the lowest value. Attracting backers with high clustering and homogenous preferences in relation to those close to them should be a way to more easily motivate these contacts in order to support a campaign and can therefore be expected to constitute a success factor.</p>
<p><b>BETWEENNESS</b></p> <p>Intermediation centrality: the ratio between the number of times a node serves as a transition point along the shortest path between two other nodes and the total number of shortest paths in the network.</p> <p>Normalised intermediation centrality: intermediation centrality in relation to the total number of shortest paths in the entire network.</p>		<p>User 4 again emerges as the most central user: He or she is the link between the different groups, particularly those at the bottom and on the right. The nodes located on the periphery appear in white. They are rarely located along the shortest paths.</p>
<p><b>EIGENVALUE</b></p> <p>Eigenvector centrality (EC): each node is attributed a value that corresponds to the sum of its neighbours' degrees and is then again attributed the value obtained by the same neighbours and so on until the values stabilise. The whole figure is then divided by the largest eigenvector <math>\lambda</math> to solve the equation <math>AX = \lambda X</math>, where <math>A</math> is the graph's adjacency matrix and <math>X</math> is the vector that corresponds to the importance of each node's neighbours.</p>		<p>User 4 appears as the most important. He or she is tied to the largest number of other backers who themselves have ties with many others. We interpret a high EC value as an indicator of shared preferences with many individuals who themselves share preferences with others. Attracting such backers at the beginning of a campaign should therefore be a way to attract many others.</p>