

## Social identity and signalling success factors in online crowdfunding

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### Abstract

Online crowdfunding means relying on the Internet to seek financial support from the general public. In this paper we examine success factors in the social capital networks of the top 5000 most funded projects in Kickstarter.com at the time of this study. We first look at how fundraisers and backers identify themselves with the projects they support in their own social networks. This is modelled using Facebook friends, and Facebook shares, respectively, guided by social identity theory. Secondly, we use signalling theory to investigate crowdfunding success based on backers' and fundraisers' ability to engage in a forum, modelled using the number of comments between them, or with unilateral signals using the number of updates from the fundraiser. This study suggests that funders and backers who identify themselves with the projects in their own social networks are associated with greater pledge/backer ratio. We also find that projects where the fundraiser and its backers exchange more signals in a joint forum, but not signals delivered unilaterally by the fundraiser, have a greater pledge/backer ratio. These findings, based on a scalable quantitative study, highlight the importance of a multi-theory approach, advance social identity theory and signalling theory in the context of crowdfunding, and could be applied to online and normal entrepreneurship environments alike.

## **1. Introduction**

Crowdfunding is expected to reach approximately \$3.2 trillion by 2020, creating more than 2 million new jobs, following an increase by 9,900% in the last decade (Fundable and Empact, 2014; Tordera, 2014). In 2012 there were 452 crowdfunding platforms active worldwide, but mostly in North America and Western Europe, helping to raise almost \$1.5 billion, and funding more than one million campaigns in 2011 (Massolution, 2012). Based on data gathered for 1,250 funding platforms worldwide, Massolution (2015) predicted the global crowdfunding market to reach \$34.4B in 2015. Online crowdfunding allows entrepreneurs to raise finances for projects and start-ups from the general public using the Internet (Schwienbacher & Larralde, 2010). Initially online crowdfunding platforms influenced the communities around them by specifying the nature of exchange (Greenberg, Hui, & Gerber, 2013) and by specifying crowdfunding categories. Crowdfunding platforms also need to be responsive to the aggregate demands of the crowds (Danmayr, 2014). In this regard, the evolution of project-specific communities that are formed could be considered to update the crowdfunding platforms as well.

The literature on online crowdfunding is growing fast, and there are some attempts to examine and explain success factors. For example, a study of over 48,500 projects with combined funding of over \$237 Million concludes that personal networks, underlying project quality and geographic location are important for successful crowdfunding (Mollick, 2014). There are attempts also to use machine learning algorithms to predict success or failure of online crowdfunding projects in Kickstarter (Greenberg, Pardo, Hariharan, & Gerber, 2013). The machine learning algorithm is not made explicit in the study, so it is difficult to judge, but we find the idea of it relevant.

Zheng, Li, Wu and Xu (2014) use social capital theory (Nahapiet & Ghoshal, 1998) to determine that entrepreneur's social network relationships, obligations to fund other entrepreneurs, and the shared meaning of the project between the fundraisers and funders have significant effects on online reward-based crowdfunding performance in both China and the U.S. A qualitative study from Lehner, Grabmann & Ebbsgraber (2015) on four cases of information and communication technology firms suggests that non-financial implications such as the relationships formed with the crowd during crowdfunding are also important. These studies give valuable insights to understand online crowdfunding, but fail to relate social capital and networking factors with the bigger picture of geolocations, industries and time taken for crowdfunding. This study attempts to fill this gap by using a large dataset to explore these variables in more detail, and it expands the theoretical underpinnings of crowdfunding with views from the literature on social identity theory (Tajfel & Turner, 1979) and signalling theory (Ross, 1977; Spence, 1973).

We believe that the core idea of crowdfunding where rewards may be financial such as a rate of return on their investment, as well as non-financial such as a personalised model of a product, exclusive use of a service, or gratitude for assisting the project is deeply rooted in the social constructs of the crowds, fundraisers and platforms, so success cannot be translated as simply securing funding or not. At the same time, we are aware that entrepreneurship is contextual (Welter, 2011) and multidisciplinary not only because of its subjects of analysis, but also because most of the field's leading scholars come from a wide range of disciplines, each with their own approaches and convictions, yet all aspiring to be considered scientific. Many of them fall within the positivist tradition of empirical research (Carsrud, Brännback, & Harrison, 2014), and we intend to follow a similar path for consistency and comparability with previous works when answering our main research

question: What is the role of social identity and signalling in social capital networks of reward-based crowdfunded projects and entrepreneurship?

To answer the research question we examine the 5000 most funded projects in Kickstarter.com in April 2014, considering this as a starting point for what can be a determinant of success in entrepreneurial terms. We review some theoretical lenses to refine the definition of success in reward-based online crowd-funding. Findings are presented and we operationalise the multiple realities of success factors for decision-making by entrepreneurs.

The first contribution of our study is to review the multidisciplinary nature of crowdfunding which has previously been looked at from different perspectives. To do so we examine literature from entrepreneurship, economics, marketing and information systems journals. Our second contribution is to explore how social identity theory advances our understanding of crowdfunding and social capital structural success factors. We use fundraisers and backers identity in their own networks to help us understand crowdfunding. Our third contribution is to examine how signalling theory related to social capital cognitive success factors influences crowdfunding, as captured by backers and fundraisers' ability to convey information in a project. Finally, this is the first study on crowdfunding performing multivariate regression models which controls for the location of the crowdfunding project by country or state in the United States of America. In addition, we also control projects by industry using Standard Industrial Classification (SIC) codes, and the time they spend crowdfunding, something that other studies haven't done either. The scope is to explore and compare social capital success factors related to social identity and signalling not only within given projects, but considering also the geographic, industry or time dimensions they are part of. The findings of this study could be used to guide further research, help fundraisers and crowdfunding backers to make better strategic decisions, and inform policy in general for

assessing social capital and generating successful collaborative projects in entrepreneurship networks.

The paper is organised as follows. In the next section we draw upon the crowdfunding literature and theoretical frameworks to present the conceptual framework for the study and develop the hypotheses. The second section explains the data collection and analysis techniques adopted. This is followed by a presentation of the results and discussion of key findings. Lastly, the paper concludes with implications and suggestions for future research.

## **2. Theory and hypothesis development**

### *2.1 Research fields and the nature of crowdfunding*

Online crowdfunding or crowd-sourcing means relying on the Internet to directly seek financial support from the general public (Belleflamme, Lambert, & Schwienbacher, 2014; Geiger, Seedorf, Schulze, Nickerson, & Schader, 2011; Kleemann, Voß, & Rieder, 2008; Lambert & Schwienbacher, 2010; Mollick, 2014; Schwienbacher & Larralde, 2010; Voelker & McGlashan, 2013). This offers an alternative to traditional funding opportunities for innovative entrepreneurs that find it difficult to raise finances via traditional methods (Ordanini, Miceli, Pizzetti, & Parasuraman, 2011). Previous studies have suggested that small firms are less likely to receive funding, and as a result, more likely to fail (Cressy, 2012: 262; Yallapragada & Bhuiyan, 2011). This study challenges the long-standing view that small firms are constrained by the amount of internal finance (Butters & Lintner, 1945; Carpenter & Petersen, 2002). As a result, online crowdfunding as an opportunity beyond angel investors, venture capitalists or bank loans (Schwienbacher & Larralde, 2010) could challenge what we know about small firms and their access to finance.

Four models of crowdfunding can be broadly identified. The first is the donation-based where the funders usually support charity projects. An example of this is JustGiving in

UK. The second is investment crowdfunding. Here funders can buy into a project or business. Some examples could be Somolend in the US or Crowdcube in the UK. The third type is based on crowdsourcing and group lending, where funders expect a return of their donation, with or without interest. The best know example of this is Kiva. Finally, in the reward-based system funders can receive tangible or intangible items such as a personalised model of the product being developed by a project, or a simple 'Thank you' note for example, after the project is finalised. The flexibility of the fundraisers to propose individual reward schemes that suit their projects and the novelty in the transaction model combining both relational and financial elements makes this last crowdfunding type worth investigating in more detail. The complexity of reward-based online crowdfunding requires a multidisciplinary approach. Entrepreneurship studies look at the opportunities offered by online crowdfunding for financing start-ups and venture growth. Research shows that small businesses usually receive support from their local networks (Mason, 2007; Sohl, 1999; Sorenson & Stuart, 2005; Wong, 2002; Zook, 2002), so geographic distance does matter. Traditional knowledge on entrepreneurship suggests that this is especially true in high-tech, or research and development areas (Florida & Kenney, 1988; Powell, Koput, Bowie, & Smith-Doerr, 2002) where clustering of businesses, sources and funding and other resources can be noticed. In the case of online crowdfunding, entrepreneurs rely on a community that enjoys specific benefits and rewards from participation (Belleflamme et al., 2013). Successful online crowdfunding is often defined by the amount of money raised, influenced mainly by the nature of personal networks, project quality and geographic location (Mollick, 2014). Burtch, Ghose & Wattal (2013), on the other hand, propose dollar per unit of time as a new measure to assess online crowdfunding, suggesting that a key benefit of the model is its potential for attention-building around causes and ventures.

Research on the economic aspects and the geographic relevance of online

crowdfunded projects suggests that the distance frictions are diminished, but not because the entrepreneurs are not early stage, to the contrary (Agrawal, Catalini, & Goldfarb, 2011). Instead, Agrawal et al. (2011) argue that this happens thanks to the platform that provides an environment purposely designed for early stage entrepreneurs where they can showcase prototypes, present a business plan and interact directly with the crowd. Financing of early-stage ventures remains geographically centralised since funding decisions are often based on personal relationships and existing networks in response to risk, uncertainty, and information asymmetry (Agrawal, Catalini, & Goldfarb, 2013). However, in a study of Kiva, a peer-to-peer lending platform, Burtch, Ghose & Wattal (2014) conclude that as physical distance increases, the relevance of cultural distances decreases, a substitution effect important in such electronic markets. In this research both the geographic clustering argument and the dispersion argument are explored in the context of top successfully funded projects.

Online crowdfunding platforms could enable fundraisers to make use of consumers' project-screening capabilities and funds (Ordanini et al., 2011). Drawing from resource exchange theory, Greenberg, Hui & Gerber (2013: p. 83) argue that too much focus on the financial nature of crowdfunding has obscured the complex interpersonal interactions involving the exchange of other non-financial resources such as 'love, information, status, goods, and services through mediated, unmediated, and hybrid structures'. Co-creation with consumers is identified as the future of competition (Prahalad & Ramaswamy, 2013). Information, knowledge, and labour can enable consumers to become co-creators of value contributing to quality (Lengnick-Hall, 1996), innovativeness and marketing (Fang, 2008). Previous research also suggests that consumers that are more likely to engage in the co-creation process are innovation orientated (Ordanini et al., 2011), and can socially relate with the context of the projects, not to forget the expectation to receive a return for their contribution.

The dual identity of funders as supporters and co-creators in one hand, and that of entrepreneurs as fundraisers and network builders on the other, makes social capital, social identity and signalling some key elements to study and understand the dynamics of crowdfunding and related success factors.

## *2.2 Reward-based online crowdfunding in theoretical lenses*

The field of entrepreneurship has seen a dramatic increase in studies focusing on social capital, networks and relations (Jack, 2010). According to theories of social and organisational networks (George, McGahan, & Prabhu, 2012) firm performance is improved when entrepreneurs form relationships with actors who can provide capital, advice, access, and other valuable resources (Burt, 2009b; Kotha & George, 2012; Sorenson & Stuart, 2001).

Bourdieu (1983) lists social capital along economic and cultural capitals. In his work 'The forms of capital' first published in 1986 and reprinted in 2011, he defines it as 'the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition' (Bourdieu, 2011: p. 86).. He continues by stating that 'The profits which accrue from membership in a group are the basis of the solidarity which makes them possible' (ibid.). Coleman (1988) on the other hand categorises social capital in three forms using rational action theory: 1) obligations and expectations, 2) information channels, and 3) social norms. This is consistent with Putnam's (1995) work, showing a positive relationship between the density of associational membership in a society, trust and engagement. Burt (1997) on the other hand distinguishes between social capital as a quality created between people, and human capital as a quality of individuals. He adds that while social capital can enhance managers' ability to identify and develop opportunities, it helps them also to achieve higher returns on their human capital (ibid.). Lin, Cook & Burt (2001: p. 12) in this context



relate social capital to ‘resources embedded in a social structure which are accessed and/or mobilised in purposive action’. Finally, Adler & Kwon (2002) propose a general framework combining social capital sources, benefits, risks and contingencies.

Social capital in entrepreneurship (Kim & Aldrich, 2005) has often been related to economic development (Woolcock, 1998), knowledge sharing (Yli-Renko, Autio, & Sapienza, 2001), recognition of new opportunities (De Carolis & Saporito, 2006), social entrepreneurship (Mair & Marti, 2006), non-profit organisations (Bahmani, Galindo, & Méndez, 2012), or ethnic minorities (Dana, 2007). Inspired by the work of Bourdieu (1979; 1990; 1992), the concept of habitus is presented as the ‘modus operandi’ of entrepreneurs when they engage with each other to grow their ventures (Anderson, Dodd, & Jack, 2010).

A limited but increasing number of recent studies have investigated the role of social capital in the virtual environment, referring to it also as social media capital (Saxton & Guo, 2014), virtual business relationships (Townsend, Wallace, Smart, & Norman, 2014), online learning and identification of opportunities (Li, Chen, Liu, & Peng, 2014), or online crowdfunding (Beier & Wagner, 2014). Using Bourdieu’s four forms of cultural, social, economic and symbolic capital, in a qualitative study of 36 crowdfunded projects, Lehner (2014) shows that crowdfunding helps opportunity recognition, formation, and exploitation through the constant exchange of ideas between entrepreneurs and the crowd. Social capital in this case goes beyond strategic alliances for access to resources held by others (Davidsson & Honig, 2003; Ozcan & Eisenhardt, 2009; Slotte-Kock & Coviello, 2010). Giudici, Guerini & Rossi-Lamastra (2013) identify the positive effect of individual social capital (ISC) on crowdfunding success, but no relationship with territorial social capital (TSC). Colombo, Franzoni & Rossi-Lamastra (2015) consider also the time dimension, suggesting that success in online crowdfunding depends on the inherent and individual internal social capital of projects and their crowd mediating from the campaigns’ early stages.

Research recognises the dual structural and cognitive nature of social capital in entrepreneurship. Anderson (2002) states that social capital can act as ‘glue’ for bonding network structures, and as ‘lubricant’ for facilitating relationships. Burt (2009a) refers to closure as a mechanism for strengthening relationships through trust and alignment, and brokerage as a mechanism for building connections, associated with growth and innovation. Lin, Cook & Burt (2001: p. 8) elaborate on how groups evolve and maintain social capital as a collective asset. Zheng et al. (2014) use the structural, relational and cognitive dimensions suggested by Nahapiet & Ghoshal (1998) for studying social capital in crowdfunding networks. They summarise that social network ties, obligations of fundraisers to fund others, and the shared meaning of projects have significant effects on crowdfunding performance (Zheng et al., 2014). Although we believe that the duality of social capital is sufficient to include the overlapping structural, relational and cognitive dimensions, we find these findings useful. What we find more problematic in the study of Zheng et al. (2014) is the selection of measures for the independent variables. The number of Facebook friends or Weibo fans is selected for studying network ties, and the number of other projects fundraisers have funded is chosen for studying obligations; however, these measures are both external to the crowdfunded projects. The number of words in the project description used for analysing shared meaning on the other hand is passive and static, telling us little about the social capital dynamics and processes. What we propose is two complementing theoretical perspectives to social capital theory that can help us explain its duality of actor-network structures and cognitive processes: Social identity theory and signalling theory.

Social identity theory proposes that when people categorise themselves as members of a group, they act according to their social identity (Tajfel & Turner, 1979). Self-categorization theory expands this view by focusing on the nature, motives and consequences of self-categorization processes (Sindic & Condor, 2014). Jiang and Carrol (2009) theorise

that although the foundations of social capital theory and social identity theory are different, the first being a sociological perspective and the second investigating cognitive and psychological issues, they are related because shared social identities are based on shared interests that drive social ties and networks, leading social capital. Entrepreneurship research suggests that personal identities are value-expressive and affect goals entrepreneurs set for themselves and their ventures, both directly and indirectly (Conger, York, & Wry, 2012).

In crowdfunding, identity influences what people do and why they give (Gerber & Hui, 2013), supporting efforts that are consistent with their identity and aspirations (Aaker & Akutsu, 2009). Recruiting and clustering similar others to increase identity-based commitment is a relational mechanism that affect participation (Resnick & Kraut, 2011). However, the project crowds are not entirely homogenous. Research suggests that general funders consider the identity of prior funders, and potentially discount investments made by friends and family (Agrawal, Catalini, & Goldfarb, 2015). Gerber, Hui & Kuo (2012) argue that understanding identity is important for the ongoing engagement with the crowds. Muller, Geyer, Soule and Wafer (2014) use homophily theory and social identity theory to conclude that multiple identity facets of geography, formal corporate structure, working groups and the "superadditive" combination of these facets influence the likelihood of voluntary collaborations. Considering the uniqueness of crowdfunding projects and their crowds, it is implied that both the fundraisers and the funders identify themselves in them. To what extent the fundraisers' personal network in a social media like Facebook, and shares of the project outwardly lead to successful identification of funding crowds with the project and ultimately its success is what this study will try to find out.

Signalling theory suggests that the behaviour of individuals or organisations, when parties have access to different information, depends on how the sender communicates

(signals), and how the receiver chooses to interpret them (Connelly, Certo, Ireland, & Reutzel, 2011). The theory originates from the works of Spence (1973) and Ross (1977). Traditionally this has been related to signals traditional funders such as banks, angel investors or venture capital firms send about start-ups and companies they lend to or invest in. Crowdfunding research shows that early support from friends and family also generate positive signals for later funders through accumulated capital (Agrawal et al., 2013). Crowds' due diligence and reputation signalling are two possible mechanisms in crowdfunding that can reduce information-related market failures (ibid.). The very collaborative and unique nature of signals and communications between members in reward-based crowdfunding communications has not been fully captured by previous studies. Using signalling theory, this research will contribute in this direction by focusing on the communication between fundraisers and backers.

Empirical studies using signalling theory have been generally controversial. Some research shows that investment by existing investors confers a positive signal about the quality of young ventures, serving as an endorsement of value and commitment (Mohammadi, Shafizadeh, & Johan, 2014), although this doesn't seem to hold true in the long term (Busenitz, Fiet, & Moesel, 2005). Recent research on equity crowdfunding suggests that entrepreneurs' human capital expression in retaining equity and providing information about risks can be interpreted as an effective signal, but social capital and intellectual capital seem to have little or no impact on funding success (Ahlers, Cumming, Günther, & Schweizer, 2015). Also contrary to theory, franchising investors for example seem to make significant investments even when entrepreneurs refuse to disclose information (Michael, 2009). Using signalling theory, a study of 192 projects from a Chinese crowdfunding platform, demohour.com, suggests that the frequency of announcements by fundraisers and the amount of the highest bid have an impact on the success of crowdfunding

projects, although there are some differences between the high-tech and movie/music industries (Wu, Wang, & Li, 2015). We will contribute to this generally-unexplored and controversial area by looking at comments exchanged between funders and fundraisers, and one-way updates from fundraisers in reward based crowdfunding. By doing so we aim to identify relationships that we can feed back to signalling theory.

### *2.3 Hypotheses*

For our hypotheses, we propose a model based on a structural dimension informed by social identity theory, and a cognitive dimension informed by signalling theory as shown in Figure 1.

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Insert Figure 1 here

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Some research suggests that if entrepreneurs are able to use their social ties and capital effectively they can improve their commercial success and grow (Drakopoulou-Dodd, Jack, & Anderson, 2006). In early stages, the social embeddedness of entrepreneurial activities appears to be more important than their calculative management approach later (Hite & Hesterly, 2001). However, a later qualitative study shows that network structures can evolve also from calculative to affective ties (Jack, Moulton, Anderson, & Dodd, 2010). Social identity theory provides a good starting point for explaining this contradiction, suggesting a direct relationship between people's self-categorisation as members of a group and their actions (Tajfel & Turner, 1979). As individuals identify themselves with various groups, their identities are also being influenced in a complex way. In order to determine which one is

predominant, it might be necessary to look at mobilised social capital and resources jointly (Lin et al., 2001: p. 12). In this study we do this by analysing the size of the social network in the light of its capability to raise finances using the pledge/backer ratio as an indicator. This is calculated based on the total amount of USD pledged for a project, divided by the total number of backers for that project, taking the natural logarithm as explained in the methodology section.

According to social identity theory, identity influences what people do and why they give (Gerber & Hui, 2013). This means they support efforts that are consistent with their identity and aspirations (Aaker & Akutsu, 2009). The ability of fundraisers to demonstrate their identity within larger social network such as Facebook for example even before they communicate their desire for crowdfunding, could place them in a favourable position when they decide to do so. Indeed, in such a scenario the fundraiser would be expected to secure greater amounts of pledges and backing of the crowdfunded project. Previous studies show that the higher the number of Facebook friends, the more successful an online crowdfunded project could be in terms of amount of money raised (Mollick, 2014). It needs to be noted that crowdfunding may also facilitate legitimacy development for nascent ventures (Frydrych, Bock, Kinder & Koeck, 2014). As Reuber and Fischer (2011) note, venture's online reputation can support entrepreneurial activities which are Internet related, such as attracting investors. They argue the firm's reputation with customers is co-created with legitimacy in an online environment.

A counterargument could be that in large social networks, the bad news of poor funding, especially in early days of a crowdfunding project, could have a negative multiplier effect. Through our findings we intend to make a theoretical contribution by looking at how the social and economic networks are identified with each other. This hypothesis is expected to test how the fundraisers' ability to demonstrate their identity in larger social networks is

associated with success in terms of the pledge/backer ratio, a different measure of success compared to previous studies.

**Hypothesis H1:** The greater the extent of the social network where the fundraiser demonstrates his or her identity related to the project, the greater the pledge/backer ratio.

Social identity theory suggests that recruiting and clustering similar others from outside is a relational mechanism that affect participation to increase identity-based commitment (Resnick & Kraut, 2011). The first hypothesis relates to the fundraisers identity in their own social network. However, there is a need to also focus attention on the backers and supporters' identity in their own social network, and the relationship with crowdfunding. Developing the backers' identity and becoming part of the network is related to an organic process of sharing where no one could dominate, nor appear self-seeking, making the process iterative and mutual (Anderson & Jack, 2002). Building on this argument, the second hypothesis is expected to examine an interesting phenomenon that is not touched by empirical research on social capital networks in crowdfunding: the backers' and supporters' demonstration of their identity in their own social networks. This becomes even more relevant considering the large dataset we are examining.

Kickstarter allows a transmission mechanism whereby the backers and anyone else can exploit their identity by sharing the project in their own social network to help improve the amount of crowdfunding which is pledged. More shares mean more word-of-mouth online promotion for the project beyond the direct network circle of the fundraiser. The more backers and supporters identify themselves with the project in their social networks, the more

this could expand the number of potential new backers who could support the project. This could increase the pledge/backer ratio.

The counterargument could be that if those sharing have a strong identity in their own social network, this could overshadow that of the fundraisers' identity, or it. At the same time, it could create an expectation for more social response and further exchanging of information with the social circle before potential backers could contribute financially, which in turn could delay funding. This hypothesis is expected to test how the backers and supporters' identity in their own social network is associated with success in terms of the pledge/backer ratio.

**Hypothesis H2:** The greater the extent to which backers and supporters identify themselves with the crowdfunded project in their own social networks, the greater the pledge/backer ratio.

Signalling theory suggests that entrepreneurial activities are related to access to different information parties have, and how they communicate and interpret it (Connelly, Certo, Ireland, & Reutzel, 2011). Studies using signalling theory in general have been focused on the signals given via investments and movements of capital, rather on verbal, informal and social forms of communication. This gap is filled in this study by linking signalling theory and social capital theory.

Entrepreneurs should be able to listen to comments and turn them into opportunities (Jack, Drakopoulou-Dodd, & Anderson, 2008). The network environment in this hypothesis has shifted from the social identity addressed in H1 and H2, to the more calculative one of signalling. As mentioned earlier when explaining crowdfunding entrepreneurship from a marketing perspective (Ordanini et al., 2011), consumers can socially engage through



crowdfunding in the co-creation process and context of the project while expecting to receive a return for their contribution.

Internal but public signals from backers and the fundraiser in a forum are probably the most dynamic form of cognitive interaction in online crowdfunding. Backers can signal on what they like and what they don't like, suggest changes, promote, or critique. Fundraisers on the other hand can respond to backers' signalling with their own signals. Addressing backers' information which has been signalled should help the fundraiser recognise opportunities (Jack et al., 2008), but more importantly contribute proactively to the cognitive dimension of social capital in the network in a virtual environment. Ultimately, this interaction would make the project even more competitive, achieving a higher pledge/backer ratio value.

**Hypothesis H3:** The greater the extent to which backers and the fundraiser exchange signals with each other in a project's forum, the greater the pledge/backer ratio.

Signals by the fundraiser in the form of unilateral updates about progress in the project or information are another form of cognitive engagement in the crowdfunding network. Their purpose is to create momentum, share processes or celebrate success (Kickstarter, 2014a). Research using signalling theory shows that the frequency of announcements by fundraisers is important (Wu et al., 2015), so we decided to investigate more in-depth in this direction. The importance of harnessing social media for business is evidenced by previous studies, suggesting that this may have significant leverage also in crowdfunding (Ley & Weaven, 2011). In our study, the following hypothesis is intended to investigate this.

**Hypothesis H4:** The greater the extent to which the fundraiser conveys unilateral signals in the project, the greater the amount pledged/backed.

As a counterargument to both H3 and H4, signals could also be negative due to challenges after the campaign, such as delays in delivery and overspending (Mollick & Kuppuswamy, 2014). This could have a negative impact; however, we expect the positive impact of signals to be greater. In this context, to a certain extent, this hypothesis is expected to test also the quality of the network of backers and their signalling ability, besides its size and identity analysed by H1.

### **3. Data collected and research method**

#### *3.1 Sample and Data Collection*

In April 2014 detailed records of the 5000 most funded projects in Kickstarter were extracted. For each of them we captured specific information details available on the website, categorised for the purpose of this research to better understand the characteristics which explain the raising of finance. The literature on networking theory in entrepreneurship is mainly based on longitudinal qualitative studies of a few cases. This study cannot offer a longitudinal perspective of network changes because it captures only the final figures of online crowdfunding projects when the data was collected. However, what it can offer that the first approaches cannot is breadth across 5000 cases, multiple industries and countries to understand the nature of networks and social capital in measurable and specific terms.

Figure 1 and 2 show the geographical locations of the Kickstarter projects globally but excluding the United States, and then for the United States of America. Whilst figure 2 shows that Kickstarter has a reach across all continents it is apparent that the Kickstarter

projects are concentrated in a handful of English speaking countries. 4,265 of the Kickstarter projects are located in the United States of America and especially California (1,326), New York (623), Washington (235), Texas (212), Illinois (167), and Massachusetts (159). 733 of the Kickstarter projects are dispersed in other countries.

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Insert Figure 2 here

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Insert Figure 3 here

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The UK has 290 Kickstarter projects and it is the country with the second largest concentration of projects. Canada has 125 projects and is ranked third. Thereafter there is a large drop in the number of Kickstarter projects in Japan, and France with 20 and 18 projects, respectively.

### *3.2 Measures*

#### *3.2.1 Dependent variable*

In our main regression models the total amount pledged was divided by the total number of backers, and then a natural logarithm was taken (pledge/backer ratio). This is our main dependent variable and this indicator relates crowdfunding success (Pledges) to the network social capital (Backers), providing a better indicator than the pledge/goal measure used by previous studies (Lambert & Schwienbacher, 2010; Zheng et al., 2014). As a

sensitivity analysis a second dependent variable, a logarithm of the total amount pledged for each project (Total Pledge) was also used. Combining the number of backers and the amounts pledged makes them endogenous to the projects because social capital is both structural and relational (Anderson & Jack, 2002). Social capital, according to networking theory in entrepreneurship, is the source of our independent variables too.

Table 1 shows the key independent and control variables used in the analyses and indicates the manner of their construction. To test H1 we have used the number of friends of the founders on Facebook. The second independent variable is number of shares by backers of the project on personal Facebook pages, and this allows us to test H2. The third independent variable is the number of comments exchanged between backers and the fundraiser, and this allows us to test H3. The fourth independent variable is the number of updates which have been posted by the fundraiser, and this allows us to test hypothesis H4. Table 2 presents summary statistics and a correlation matrix. The variance inflation factors (VIF) ranged from 1.94 to 4.48 which is comfortably below the recommended upper limit of 5 suggested by Kutner et al. (2004).

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Insert Table 1 here

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## 4. Results

Ordinary least squares regression analysis was used to estimate the models (Greene, 1997). The models 1 and 2 relate to the pledge/backer ratio as the dependent variable (Table 3) whilst models 3 and 4 have Total Pledged as the dependent variable (Table 4). The control variables are included in Model 1. The four independent variables are added to the control variables in Model 2. Repeating the models with only one independent variable added to the control variables produced the same results. Model 1 has an  $R^2$  of 0.110 and an Adjusted  $R^2$  of 0.103. Model 2 has an  $R^2$  of 0.253 and an Adjusted  $R^2$  of 0.243. In Model 3 the control variables are included in the model of Total Pledged, and in Model 4 the independent variables are added to the control variables. Including one independent at a time with the control variables produced the same results. Model 3 has an  $R^2$  of 0.332 and an Adjusted  $R^2$  of 0.126. Model 4 has an  $R^2$  of 0.404 and an Adjusted  $R^2$  of 0.395. For all the models in Tables 3 and 4 the F test statistic is highly statistically significant and shows that taken together the variables included in the models do have a relationship with the dependent variables.

The number of friends the fundraiser has on his/her own Facebook page linked to the project page in Kickstarter (FRIENDS), and the number of comments that backers have posted on the project website (COMMENTS) are positively statistically significantly related to the amount pledged per backer at the 0.01 level. Thus, hypotheses 1 and 3 are strongly supported.

The number of visitors who have visited the project webpage and shared it with their own Facebook page (SHARES) is also positively statistically related to the amount pledged per backer but this is weakly significant at the 0.10 level. Thus, the results provide weak support for hypothesis 2.

The number of updates about the projects which have been posted during and after the fundraising period (UPDATES) appears with a positively signed coefficient but this is not

statistically significant at the 0.10 level, or better. Thus, the result does not support hypothesis 4.

Two of the location control dummy variables are statistically significant at the 0.01 level in model 2. Projects which were based in West South Central and the UK were more likely than projects based in the Pacific region to have a higher pledge/backer ratio. In model 2 several of the industry dummy variables are related to the pledge/backer ratio. Projects which are in SIC 1, SIC 10, SIC 17, SIC 25, SIC 28, SIC 47, SIC 58, SIC 59, SIC 60, SIC 74 and SIC 90 had a smaller pledge/backer ratio compared to projects in SIC 56. Projects which are in SIC 20, SIC 30, SIC 31, and SIC 72 had a larger pledge/backer ratio compared to the excluded comparison sector of SIC 56. The number of days that the project received funding (DAYS) is positively statistically significantly related to the amount pledged per backer at the 0.01 level.

As a form of sensitivity analysis we then ran models with the total amount pledged as the dependent variable. The results of the models with the total amount pledged produced similar results in terms of the relationships which are statistically significant, and the level of significance with regard to our four independent variables (See Table 4).

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Insert Table 3 here

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Insert Table 4 here

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## 5. Discussion

In our first hypothesis we focused on the first structural element: social network size and the fundraiser's ability to identify themselves with the project in it, by looking at the number of Facebook friends. Our study strongly confirms that the greater the number of fundraiser's Facebook friends (network size), the greater the pledge/backer ratio. In the light of social identity theory this confirms that when people categorise themselves as members of a group, they act according to their social identity (Tajfel & Turner, 1979). In our case the social and business networks of crowdfunding entrepreneurs are related, and members could identify themselves with both. Ultimately, in the context of social capital we can say that the size of the social network is related to its business efficiency. Both social and crowdfunding networks combined seem to increase the density of associational membership (Putnam, 1995), whereby trust and engagement are strengthened proportionally to the network size. Evidencing this for our top 5000 Kickstarter projects could suggest that the social network actors are not related only to the fundraiser, but potentially also to each other.

It is important to notice also that the larger social networks do not lose their efficiency due to potential higher breadth over depth of relationships. This study confirms that the bigger the social network size, the more successful a project could be in terms of amount of money raised (Mollick, 2014) or the pledge/goal measure (Lambert & Schwienbacher, 2010; Zheng et al., 2014). It also adds that this holds true when the pledge/backer ratio is used as a success indicator. This measure could be used to explain better in quantitative terms the relationship between social capital and resources mobilised in a purposive network action suggested by social capital theory (Lin et al., 2001: p. 12). Our study confirms the inherited characteristic of larger network to have a positive impact on entrepreneurship crowdfunding. Future research could investigate further if the fundraiser manages them actively, potentially considering a more hierarchical approach to micro-communities within them to deal with complexity.

The second hypothesis focused on the extent to which backers and supporters identified themselves with the project in their own social networks. This was tested using the number of shares of the project on personal pages. We employ the views from social identity theory that recruiting and clustering similar others affect participation (Resnick & Kraut, 2011), in which case people categorising themselves as members of a group share social identity features (Tajfel & Turner, 1979). Enrolment via shares in our study is considered not a centrally controlled process, but open. There are three groups that could share the project on their own Facebook sites: 1) existing backers who represent committed social network members; 2) uncommitted social network members who are fundraiser's social network friends, but not backers; 3) random visitors to the project online. The moderate support for this hypothesis that the greater the extent to which backers and supporters identify themselves with the project in their own social networks, the greater the pledge/backer ratio, shows that there might be some conflict between these groups that should be investigated further. The number of shares is used to test the second hypothesis but our aggregate number of shares does not allow us to differentiate between the three groups. Nevertheless, we find social identity theory and social capital theory useful for analysing similar environments where a) existing network members could enrol external members; b) external network members could enrol themselves; or c) external network members could enrol other external network members even without being enrolled themselves. Our contribution to the theories is showing that in such an environment shares could have a moderate positive impact on the success of entrepreneurial networks measured by crowdfunding pledge/backer ratio.

Our third hypothesis that was strongly supported confirms that the greater the extent to which the backers and the fundraiser exchange signals in a project's forum with each other, the greater the pledge/backer ratio. This concurs what previous research has identified that consumers in crowdfunding entrepreneurship can engage more as co-creators (Ordanini et al.



2011). To investigate this cognitive dimension in more depth we employ the view from signalling theory that entrepreneurial activities are related to access, distribution, and interpretation of messages between the parties involved (Connelly, Certo, Ireland, & Reutzel, 2011). The importance of comments revealed in our study contributes to signalling theory by adding that social communication and financial investment signals cannot be separated as previous research (Ahlers et al., 2015; Busenitz et al., 2005; Mohammadi et al., 2014) focusing more on the latter has done. The pledge/backer ratio we propose and utilise in this study is a good measure of entrepreneurship success that combines the two.

In our possible counterargument to the third hypothesis we considered that negative signals could have a negative impact on the projects, discouraging backers to follow. We used the number of comments to test the third hypothesis. Classifying and categorising such comments in order to see their impact on the pledge/backer ratio and the post-projects follow-up stage is beyond the scope of this study. This would require a more qualitative approach. However, the fact that the third hypothesis is strongly supported suggests that highly successful entrepreneurship network interactions such as crowdfunding projects are characterised by a high number of presumably positive comments. This finding builds on signalling theory by suggesting that the productivity of the networks, especially in online environments where direct interactions are limited, is associated with the ability, willingness and participation of its members.

The fourth hypothesis is that the greater the extent to which the fundraiser conveys signals in a project, the greater the pledge/backer ratio. The fourth hypothesis used the number of updates and it has been rejected. This does not allow us to confirm that there is a clear relationship between a higher number of updates posted by fundraisers and the pledge/backer ratio. This finding contradicts what previous research using signalling theory has found, confirming that the frequency of announcements by fundraisers is important (Wu

et al., 2015). Although updates were meant to create momentum, share processes or celebrate success (Kickstarter, 2014a), fundraisers and funders might have realised the higher effectiveness of forum signals between backers and the fundraisers in a project (H3) as a more direct form of communication in the virtual environment. Therefore, the rejection of this fourth hypothesis might indicate the highly adaptive and evolving nature of crowdfunding networks and the difficulties that backers face in trying to signal information in a project.

Through these findings we could confirm some of the points made by the social capital literature in entrepreneurship, suggesting that entrepreneurship social networks are complex and adaptive system. Connections and relatedness help explain their power to adapt to any change (Anderson & Jack, 2002). This holds true also in the case of online crowdfunding. The fact that updates do not play a significant role on the pledge/backer ratio, points towards the asynchronous nature of online crowdfunding networks compared to normal entrepreneurship networks in the light of social capital theory.

On a structural level, our findings from H1 support the argument that shared social identity for project network members (Tajfel & Turner, 1979) is displayed in the direct relationship between social capital resources (Lin et al., 2001: p. 12), adding that larger networks where the fundraiser is able to demonstrate their identity in their own social network have a more positive impact on entrepreneurship crowdfunding than smaller ones. Our findings from H2 generally support the argument that that recruiting and clustering similar others affects participation to increase identity-based commitment (Resnick & Kraut, 2011), specifying that shares in online social networks could have a moderate positive impact on the success of entrepreneurial crowdfunding.

On a cognitive level, our findings from H3 support that entrepreneurial activities are related to access to different information parties have, and how they signal and interpret it

(Connelly, Certo, Ireland, & Reutzel, 2011). The rejection of H4 on the fundraisers' ability to signal information in a project, as measured by updates, however, compared to the strong impact of forum signals between backers and the fundraiser in a project, as measured by comments confirmed by H3, helps classifying different types of signals used in entrepreneurship networks. These findings highlight the importance of more informal, direct and interactive ones such as comments in the case of crowdfunding.

By focusing on the extent to which the fundraiser demonstrates their identity in their own social network (H1), the extent to which backers and supporters identify themselves with the project in their own social networks (H2), signalling by the interactive forum between backers and the fundraiser (H3), and unilateral signalling by the fundraiser (H4) we build on social identity theory and signalling theory to inform our knowledge about crowdfunding. The original additions to the theories based on a scalable quantitative approach could be applied to online and normal environments and networks alike.

In our main models we also found that several of the control variables were linked to the success of crowdfunding. The number of days that each project accepted funding was systematically related to the amount of crowdfunding per backer. Research on networks and entrepreneurship shows that the strength of the bonds is based on trust and knowledge, supposedly developed over time and experience, although not necessarily based on frequent contacts (Jack, Drakopoulou-Dodd, & Anderson, 2004). Online crowdfunding presents a similar context, but a different time dimension for raising the money, based on days and not months and years like in the case of such previous research. In this case the network interaction for securing funding is more intense over a short period of time, during which trust, knowledge and experience have to be established, adjusted and possibly shared via an online platform. A different type of relationship happening via an electronic medium and

following a different time pattern enforced by the online platform presents a new reality of entrepreneurship networking.

We included a series of dummy variables in our model to capture the location of the crowdfunding projects. However, only two variables were found to be important. Crowdfunding projects in the West South Central and the UK received a greater amount of crowdfunding per backer compared to those located in the Pacific in the US. Whilst we are unable to include information on the location of the providers of the crowdfunding finance the results suggest that the geographical location of a crowdfunding project is only linked to success in a comparatively small proportion of instances. The finding may be explained by the nature of crowdfunding itself with investors being able to access the internet remotely from around the world and assess crowdfunding projects. In contrast, the industry that the crowdfunding project operates in is a much more important way of explaining the success of crowdfunding projects.

## **6. Conclusion and directions for future research**

Online crowdfunding means looking at opportunities beyond traditionally institutionalised practices of doing business and entrepreneurship networking. The multitude and continuous evolution of actors and interactions, requires a multidimensional approach that considers both structural and cognitive, micro and macro elements of networks. The entrepreneurship perspective adapted in this study seems to provide enough flexibility to deal with its complexity, but without compromising on theoretical depth. The online crowdfunding environment appears to be somehow different from the general entrepreneurship networks analysed in previous studies due to the role social capital plays in it.

On a structural level, feeding on social identity theory we present a dynamic model

where the fundraiser, backers and supporters demonstrate their identity in their own social networks. Social identity in this case emerges as an evolving mechanism rather than as an inherent and immutable feature of the funding crowds associated with the fundraisers' own social networks. The auto-enrolment and self-directed sharing of potentially anyone in Kickstarter reveals a possible detachment of social identity around the crowdfunder in one hand, and the project on the other. This has important implications for practice, suggesting that for successful crowdfunding both can and should be managed proactively. Fundraisers should not only attempt to increase the size social networks around their identities, but also be able to general projects that are able to auto-enrol crowds of backers unknown to the them through open sharing that identify themselves with the ideas of the initiatives.

On a cognitive level, feeding on signalling theory, the strong support for comments in the form of an interactive discourse between backers and the fundraiser, and the insignificance of updates as efficient signalling tools to show entrepreneurial responsiveness could suggest an evolution from formal company reports to more informal, interactive and personalised forms of communication in business in the future. This could have practical implications for many businesses, following the example of crowdfunding fundraisers who opt to give specific personalised replies to backers in the comments rather than through updates. This closer look at verbal signals in this study rather than investment signals investigated by many previous ones reveals more also about the highly adaptive and evolving nature of crowdfunding networks.

In common with previous research, our data is cross-sectional and we acknowledge that there is the possibility of reverse causation for our hypotheses. But, that is an issue which can be raised at virtually all studies on crowdfunding. A longitudinal study could be performed in the future. Also, a detailed qualitative analysis of interactions between funders

and fundraisers could have shared more light on the network dynamics. It was identified that many online crowd-funded projects use internet social media to disseminate their ideas and relate with their networks. How such interactions are influencing updates on the crowd-funded projects could be an interesting avenue for future research.

Table 1: The creation of the independent and control variables

<b>Variable Name</b>	<b>Description of how the variable is constructed</b>
<i>Independent variables</i>	
Updates	The logarithm of the number of updates about the projects which have been posted during and after the fundraising period. The updates are posted during and after the fundraising period by to create momentum, share processes or celebrate success (Kickstarter, 2014a).
Comments	The logarithm of the number of comments only backers can post on the project website to communicate with fundraisers, other backers or potential backers, but visible to any visitor.
Friends	A logarithm was applied to the number of friends the fundraiser has on his/her own Facebook page linked to the project page in Kickstarter.
Shares	Any visitor on the project website can share it on their own Facebook page during and after the fundraising period. This number is shown on the project page. A logarithm was applied.
<i>Control variables</i>	
Days	This is the logarithm of the number of days that each project accepted funding.
New England	The geographic location of each of the projects seeking finance is reported and this is categorised by country and in the case of the American projects the state. The American projects were categorised into the 9 divisions used by the United States Census Bureau (2014). Division 1 consists of New England and consists of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont).
Mid Atlantic	Division 2 consists of New Jersey, New York and Pennsylvania.
East North Central	Division 3 consists of Illinois, Indiana, Michigan, Ohio and Wisconsin.
West North Central	Division 4 consists of Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota.
South Atlantic	Division 5 consists of Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, Washington D.C. and West Virginia.
East South Central	Division 6 consists of Alabama, Kentucky, Mississippi and Tennessee.
West South Central	Division 7 consists of Arkansas, Louisiana, Oklahoma and Texas.
Mountain	Division 8 consists of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming.
Pacific	Division 9 consists of Alaska, California, Hawaii, Oregon and Washington. Excluded comparison category.
Canada	Projects from Canada.
UK	Projects from the UK.
Rest of World	Projects from the rest of the world.
SIC 1	The main activity of each crowdfunding project was coded into

	divisions of the 2007 UK SIC code (ONS 2009). Divisions 1, 3, 8, 41 and 43. Crop and animal production, hunting and related service activities, combined with Fishing and aquaculture, Other mining and quarrying, Construction of buildings, and Specialised construction activities.
SIC 10	10. Manufacture of food products
SIC 11	11. Manufacture of beverages
SIC 15	15, 13 and 14. Manufacture of leather and related products, combined with Manufacture of textiles, and Manufacture of wearing apparel
SIC 17	17, 16 and 18. Manufacture of paper and paper products, combined with Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials, and Printing and reproduction of recorded media.
SIC 20	20 and 22. Manufacture of chemicals and chemical products combined with Manufacture of rubber and plastic products.
SIC 25	25 and 23. Manufacture of fabricated metal products, except machinery and equipment, combined with Manufacture of other non-metallic mineral products.
SIC 26	26. Manufacture of computer, electronic and optical products
SIC 27	27. Manufacture of electrical equipment
SIC 28	28. Manufacture of machinery and equipment n.e.c.
SIC 30	30 and 29. Manufacture of other transport equipment combined with Manufacture of motor vehicles, trailers and semi-trailers
SIC 31	31. Manufacture of furniture
SIC 32	32. Other manufacturing
SIC 47	47 and 46. Retail trade, except of motor vehicles and motorcycles combined with Wholesale trade, except of motor vehicles and motorcycles
SIC 56	56. Food and beverage service activities. Excluded comparison category.
SIC 58	58. Publishing activities
SIC 59	59. Motion picture, video and television programme production, sound recording and music publishing activities
SIC 60	60. Programming and broadcasting activities
SIC 62	62. Computer programming, consultancy and related activities
SIC 74	74. Other professional, scientific and technical activities
SIC 90	90 and 91. Creative, arts and entertainment activities combined with Libraries, archives, museums and other cultural activities
SIC 94	94, 81, 85, 88, 91 and 96. Activities of membership organisations, combined with Services to buildings and landscape activities, Education, Social work activities without accommodation, Libraries, archives, museums and other cultural activities, and Other personal service activities

Note: The data was extracted on 10/4/2014



Table 2: Summary statistics and correlation matrix (n=4996)

	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Pledge/backer ratio	4.59	0.779	1.00									
2. Pledge	11.14	0.816	0.08 <sup>a</sup>	1.00								
3. Updates	2.803	0.821	-0.19 <sup>a</sup>	0.31 <sup>a</sup>	1.00							
4. Comments	4.265	2.013	-0.36 <sup>a</sup>	0.61 <sup>a</sup>	0.56 <sup>a</sup>	1.00						
5. Friends	6.440	1.119	-0.04 <sup>c</sup>	-0.06 <sup>a</sup>	-0.11 <sup>a</sup>	-0.18 <sup>a</sup>	1.00					
6. Shares	3.516	2.980	-0.07 <sup>a</sup>	0.22 <sup>a</sup>	-0.06 <sup>a</sup>	0.14 <sup>a</sup>	-0.01	1.00				
7. Days	3.533	0.269	0.10 <sup>a</sup>	0.02	0.05 <sup>a</sup>	-0.03 <sup>b</sup>	0.00	-0.05 <sup>a</sup>	1.00			
8. New England	0.046	0.209	-0.01	-0.02	0.03 <sup>b</sup>	-0.15 <sup>a</sup>	0.03	0.00	0.02	1.00		
9. Mid Atlantic	0.153	0.360	0.00	-0.06 <sup>a</sup>	-0.04 <sup>a</sup>	0.06 <sup>c</sup>	-0.02	0.00	-0.01	-0.09 <sup>a</sup>	1.00	
10. East North Central	0.068	0.251	-0.04 <sup>b</sup>	0.00	0.02	0.01	-0.03 <sup>c</sup>	-0.02	-0.01	-0.06 <sup>a</sup>	-0.11 <sup>a</sup>	1.00
11. West North Central	0.021	0.142	0.00	-0.01	0.01	0.03 <sup>c</sup>	0.07 <sup>a</sup>	-0.04 <sup>a</sup>	0.01	-0.03 <sup>b</sup>	-0.06 <sup>a</sup>	-0.04 <sup>a</sup>
12. South Atlantic	0.078	0.269	-0.02 <sup>c</sup>	-0.02	0.02	-0.02	0.03 <sup>c</sup>	-0.01	-0.01	-0.05 <sup>a</sup>	-0.12 <sup>a</sup>	-0.08 <sup>a</sup>
13. East South Central	0.022	0.148	-0.01	-0.05 <sup>a</sup>	0.01	-0.02	-0.01	0.01	-0.03 <sup>b</sup>	-0.06 <sup>a</sup>	-0.06 <sup>a</sup>	-0.04 <sup>a</sup>
14. West South Central	0.051	0.221	0.04 <sup>a</sup>	-0.01	0.02	0.01	0.03 <sup>c</sup>	-0.01	-0.01	-0.05 <sup>a</sup>	-0.10 <sup>a</sup>	-0.06 <sup>a</sup>
15. Mountain	0.070	0.255	-0.01	-0.01	0.01	0.04 <sup>a</sup>	-0.01	0.01	-0.03 <sup>b</sup>	-0.06 <sup>a</sup>	-0.12 <sup>a</sup>	-0.07 <sup>a</sup>
16. Pacific	0.343	0.475	0.01	0.04 <sup>a</sup>	-0.01	-0.02	0.01	-0.03 <sup>b</sup>	0.02	-0.16 <sup>a</sup>	-0.31 <sup>a</sup>	-0.20 <sup>a</sup>
17. Canada	0.025	0.156	-0.02	0.03 <sup>b</sup>	0.01	0.05 <sup>a</sup>	-0.04 <sup>b</sup>	0.04 <sup>a</sup>	-0.01	-0.04 <sup>b</sup>	-0.02 <sup>a</sup>	-0.04 <sup>a</sup>
18. UK	0.058	0.234	0.05 <sup>a</sup>	0.04 <sup>b</sup>	0.02	0.05 <sup>a</sup>	-0.11 <sup>a</sup>	0.05 <sup>a</sup>	-0.02	-0.05 <sup>a</sup>	-0.11 <sup>a</sup>	-0.07 <sup>a</sup>
19. Rest of World	0.066	0.248	-0.01	0.04 <sup>b</sup>	0.03 <sup>c</sup>	0.06 <sup>a</sup>	-0.03	0.07 <sup>a</sup>	0.03 <sup>b</sup>	-0.06 <sup>a</sup>	-0.11 <sup>a</sup>	-0.07 <sup>a</sup>

Notes: <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

Table 2 Cont.

	11.	12.	13.	14.	15.	16.	17.	18.	19.
11. West North Central	1.00								
12. South Atlantic	-0.04 <sup>a</sup>	1.00							
13. East South Central	-0.02	-0.04 <sup>a</sup>	1.00						
14. West South Central	-0.03 <sup>a</sup>	-0.07 <sup>a</sup>	-0.04 <sup>b</sup>	1.00					
15. Mountain	-0.04 <sup>a</sup>	-0.08 <sup>a</sup>	-0.04 <sup>a</sup>	-0.06 <sup>b</sup>	1.00				
16. Pacific	-0.11 <sup>a</sup>	-0.17 <sup>a</sup>	-0.11 <sup>a</sup>	-0.17 <sup>b</sup>	-0.20 <sup>a</sup>	1.00			
17. Canada	-0.02 <sup>c</sup>	-0.04 <sup>a</sup>	-0.02 <sup>a</sup>	-0.04 <sup>b</sup>	-0.04 <sup>a</sup>	-0.12 <sup>a</sup>	1.00		
18. UK	-0.04 <sup>b</sup>	-0.06 <sup>a</sup>	-0.04 <sup>a</sup>	-0.06 <sup>a</sup>	-0.07 <sup>a</sup>	-0.18 <sup>a</sup>	-0.04 <sup>a</sup>	1.00	
19. Rest of World	-0.04 <sup>a</sup>	-0.06 <sup>a</sup>	-0.04 <sup>a</sup>	0.06 <sup>a</sup>	-0.07 <sup>a</sup>	-0.19 <sup>a</sup>	-0.04 <sup>a</sup>	-0.07 <sup>a</sup>	1.00

Notes: <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.01

Table 3: The raising of finance for Kickstarter projects (logarithm of pledge/backer ratio)

	Pledged/backer	
	Model 1	Model 2
Constant	4.41 (0.16) <sup>a</sup>	4.82 (0.20) <sup>a</sup>
Days	0.26 (0.04) <sup>a</sup>	0.25 (0.05) <sup>a</sup>
New England	-0.02 (0.05)	-0.08 (0.06)
Mid Atlantic	-0.02 (0.03)	-0.05 (0.04)
East North Central	-0.05 (0.04)	-0.03 (0.05)
West North Central	-0.06 (0.08)	0.04 (0.09)
South Atlantic	-0.05 (0.04)	-0.07 (0.05)
East South Central	-0.04 (0.08)	0.06 (0.09)
West South Central	0.16 (0.05) <sup>a</sup>	0.20 (0.06) <sup>a</sup>
Mountain	-0.04 (0.05)	-0.07 (0.05)
Canada	-0.01 (0.07)	-0.02 (0.08)
UK	0.15 (0.05) <sup>a</sup>	0.22 (0.06) <sup>a</sup>
Rest of World	0.02 (0.05)	0.01 (0.06)
SIC 1	-0.44 (0.15) <sup>a</sup>	-0.28 (0.16) <sup>c</sup>
SIC 10	-0.39 (0.18) <sup>b</sup>	-0.34 (0.18) <sup>c</sup>
SIC 11	-0.14 (0.15)	-0.01 (0.16)
SIC 15	-0.10 (0.13)	-0.09 (0.14)
SIC 17	-0.65 (0.18) <sup>a</sup>	-0.61 (0.22) <sup>a</sup>
SIC 20	0.29 (0.14) <sup>b</sup>	0.44 (0.17) <sup>a</sup>
SIC 25	-0.30 (0.16) <sup>c</sup>	-0.28 (0.16) <sup>c</sup>
SIC 26	-0.18 (0.10)	-0.12 (0.11)
SIC 27	-0.09 (0.10)	-0.07 (0.10)
SIC 28	-0.33 (0.17) <sup>c</sup>	-0.30 (0.16) <sup>c</sup>
SIC 30	0.44 (0.14) <sup>a</sup>	0.40 (0.14) <sup>a</sup>
SIC 31	0.52 (0.22) <sup>b</sup>	0.51 (0.21) <sup>b</sup>
SIC 32	-0.06 (0.10)	-0.07 (0.10)
SIC 47	-0.33 (0.11) <sup>a</sup>	-0.25 (0.12) <sup>b</sup>
SIC 58	-0.57 (0.10) <sup>a</sup>	-0.52 (0.10) <sup>a</sup>
SIC 59	-0.23 (0.10) <sup>b</sup>	-0.22 (0.10) <sup>b</sup>
SIC 60	-0.79 (0.19) <sup>a</sup>	-0.78 (0.27) <sup>a</sup>
SIC 62	0.22 (0.21)	0.23 (0.27)
SIC 72	0.26 (0.10) <sup>b</sup>	0.27 (0.11) <sup>b</sup>
SIC 74	-0.26 (0.10) <sup>b</sup>	-0.17 (0.10) <sup>c</sup>
SIC 90	-0.33 (0.10) <sup>a</sup>	-0.31 (0.10) <sup>a</sup>
SIC 94	-0.03 (0.17)	-0.01 (0.19)
Updates	-----	0.02 (0.05)
Comments	-----	0.18 (0.01) <sup>a</sup>
Friends	-----	0.04 (0.01) <sup>a</sup>
Shares	-----	0.01 (0.00) <sup>c</sup>
F Test	17.96 <sup>a</sup>	24.92 <sup>a</sup>
R <sup>2</sup>	0.110	0.253
Adjusted R <sup>2</sup>	0.103	0.243

Notes: n=4996. The excluded comparison categories are Pacific division of the United States and SIC 56. <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.10

Table 4: The raising of finance for Kickstarter projects (logarithm of the total amount pledged)

	Pledged	
	Model 3	Model 4
Constant	10.49 (0.17) <sup>a</sup>	9.49 (0.18) <sup>a</sup>
Days	0.10 (0.04) <sup>b</sup>	0.13 (0.04) <sup>a</sup>
New England	-0.11 (0.05) <sup>b</sup>	-0.10 (0.06) <sup>c</sup>
Mid Atlantic	-0.06 (0.03) <sup>c</sup>	0.04 (0.03)
East North Central	-0.05 (0.05)	-0.08 (0.05) <sup>c</sup>
West North Central	-0.14 (0.08) <sup>c</sup>	-0.03 (0.08)
South Atlantic	-0.12 (0.04) <sup>a</sup>	-0.10 (0.04) <sup>b</sup>
East South Central	-0.18 (0.08) <sup>b</sup>	-0.29 (0.08) <sup>a</sup>
West South Central	-0.07 (0.05)	-0.01 (0.05)
Mountain	-0.13 (0.05) <sup>a</sup>	-0.15 (0.04) <sup>a</sup>
Canada	-0.01 (0.07)	-0.08 (0.07)
UK	0.02 (0.05)	0.04 (0.05)
Rest of World	-0.06 (0.05)	-0.14 (0.05) <sup>a</sup>
SIC 1	-0.14 (0.15)	-0.25 (0.14) <sup>c</sup>
SIC 10	-0.38 (0.17) <sup>b</sup>	-0.36 (0.16) <sup>b</sup>
SIC 11	-0.32 (0.15) <sup>b</sup>	-0.23 (0.14) <sup>c</sup>
SIC 15	-0.26 (0.12) <sup>b</sup>	-0.22 (0.12) <sup>c</sup>
SIC 17	-0.60 (0.19) <sup>a</sup>	-0.57 (0.19) <sup>a</sup>
SIC 20	0.34 (0.16) <sup>b</sup>	0.24 (0.14) <sup>c</sup>
SIC 25	-0.34 (0.16) <sup>b</sup>	-0.32 (0.14) <sup>b</sup>
SIC 26	-0.30 (0.10) <sup>a</sup>	-0.17 (0.09) <sup>c</sup>
SIC 27	-0.06 (0.10)	-0.03 (0.09)
SIC 28	-0.44 (0.14) <sup>a</sup>	-0.41 (0.14) <sup>a</sup>
SIC 30	-0.04 (0.14)	-0.01 (0.13)
SIC 31	0.16 (0.23)	0.13 (0.19)
SIC 32	-0.47 (0.10) <sup>a</sup>	-0.45 (0.09) <sup>a</sup>
SIC 47	-0.26 (0.12) <sup>b</sup>	-0.24 (0.10) <sup>b</sup>
SIC 58	-0.18 (0.10) <sup>c</sup>	-0.28 (0.09) <sup>a</sup>
SIC 59	-0.11 (0.10)	-0.05 (0.08)
SIC 60	-0.28 (0.22)	-0.21 (0.23)
SIC 62	0.20 (0.21)	0.19 (0.23)
SIC 72	0.16 (0.10)	0.10 (0.09)
SIC 74	-0.23 (0.11) <sup>b</sup>	-0.18 (0.09) <sup>b</sup>
SIC 90	-0.15 (0.11)	-0.17 (0.09) <sup>c</sup>
SIC 94	-0.16 (0.18)	-0.18 (0.16)
Updates	-----	0.00 (0.02)
Comments	-----	0.25 (0.01) <sup>a</sup>
Friends	-----	0.04 (0.01) <sup>a</sup>
Shares	-----	0.03 (0.00) <sup>a</sup>
F Test	22.20 <sup>a</sup>	49.81 <sup>a</sup>
R <sup>2</sup>	0.332	0.404
Adjusted R <sup>2</sup>	0.126	0.395

Notes: The excluded comparison categories are Pacific division of the United States and SIC 56. <sup>c</sup> p < 0.10; <sup>b</sup> p < 0.05; <sup>a</sup> p < 0.10

Figure 1: Research model for studying social capital in online crowdfunding

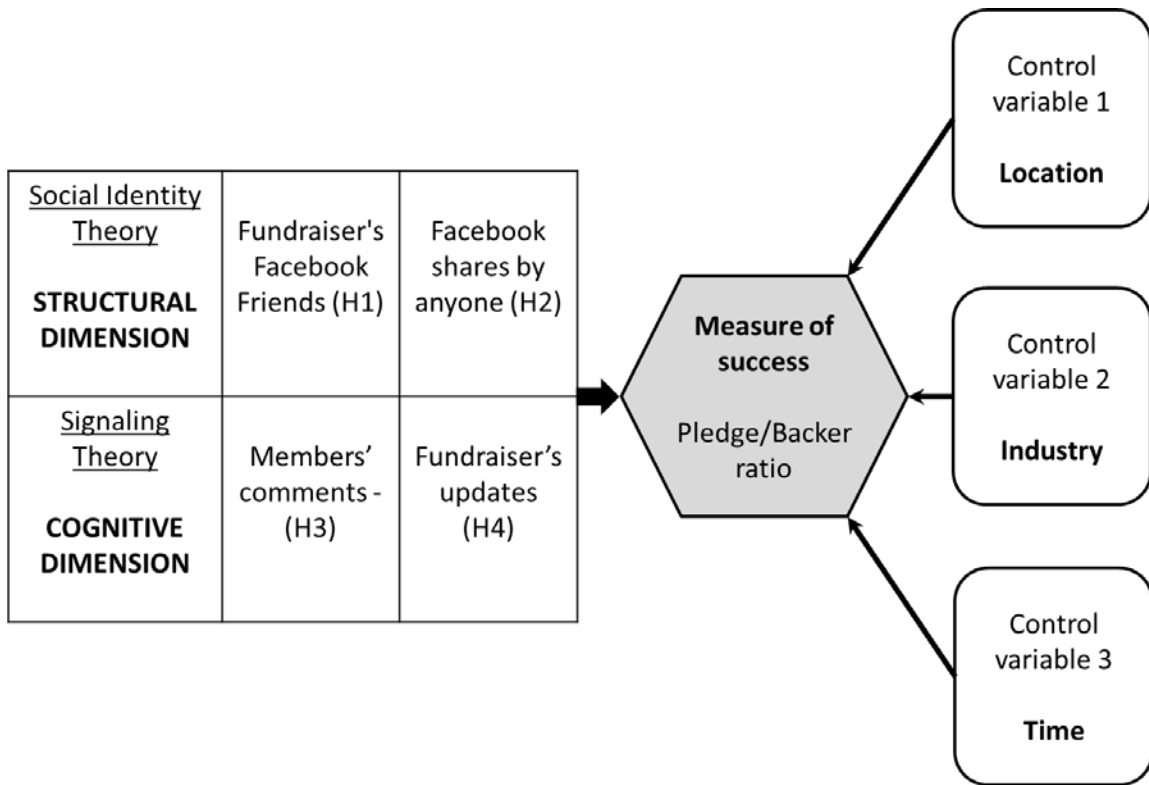


Figure 2: Global distribution of top 5000 crowdfunded projects excluding USA in Kickstarter (April 2014)

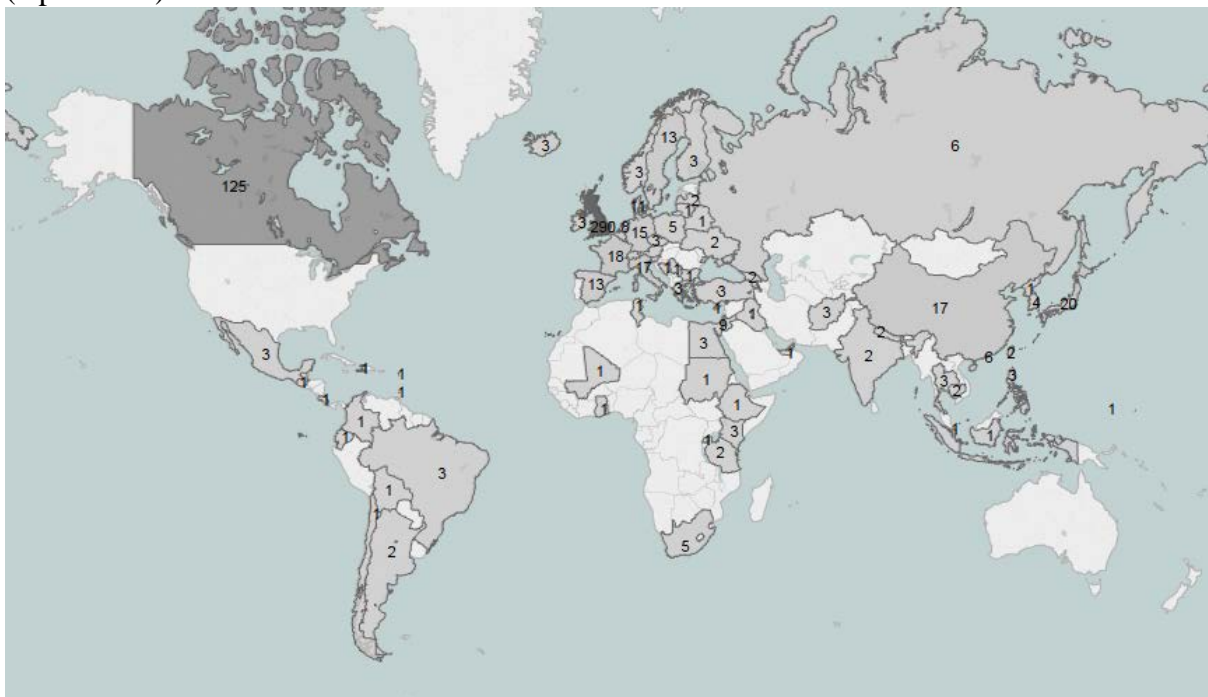
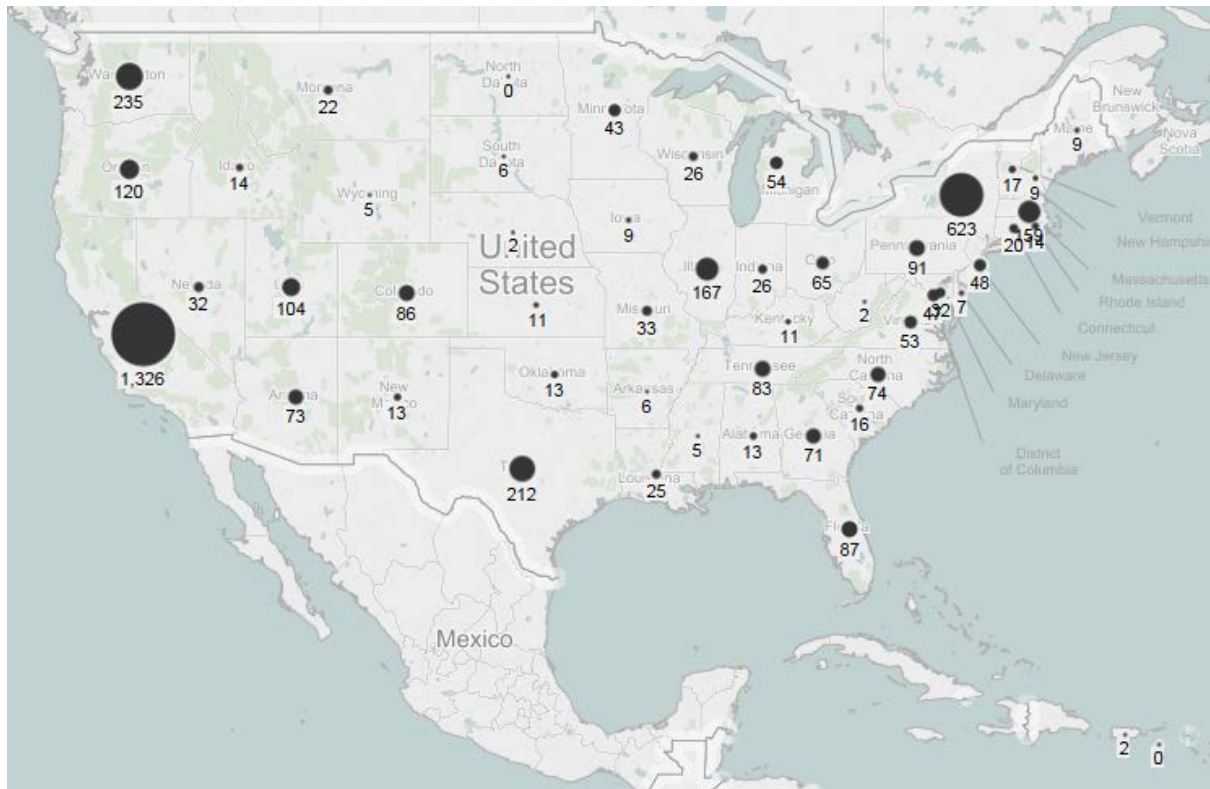


Figure 3: USA distribution of top funded projects in Kickstarter (April 2014)



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