# The influence of a social network and social interactions on the success of a crowdfunding campaign

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**Crowdfunding is a relatively new alternative technique of corporate financing. Entrepreneurs try to raise funds from a large audience (the so-called "crowd") via an Internet platform. Each individual can provide a small amount of investment (Belleflamme and Lambert, 2014). Scarcity of funding via traditional ways has spurred the growth of the crowdfunding phenomenon on a global level (Mitra, 2012). Despite the growing popularity of crowdfunding, little is known about the dynamics of successful crowdfunding (Mollick, 2014; Ahlers et al., 2015). Based on social capital theory and theory about social interactions, the research model of this study is developed. This research intends to analyse the relationship of social networks (number of Facebook friends or likes) and social interactions (number of comments, number of updates, and the (non-) existence of a project video) with the success of a crowdfunding campaign. This research focuses on European platforms, including Doorgaan, KissKissBankbank, Oneplanetcrowd and Voordekunst. The results suggest that there is no significant relationship between the social network size and the success of a crowdfunding campaign. The relationship between the social interactions about the crowdfunding campaign is significant positively related to the success of a crowdfunding campaign.**

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# 1. INTRODUCTION

Small investors are often the main target of crowdfunding campaigns (Belleflamme and Lambert, 2014). These small investors do not normally have the ability to extensively research and assess potential investment projects (Ahlers et al., 2015). Therefore, it is important for founders or entrepreneurs to find ways to clearly show the value of a certain crowdfunding project. On the one hand, crowdfunding projects have their own distinct unobservable quality. On the other hand, there are observable signals that founders may use in order to signal the projects' value to the potential funders. Connelly et al., (2011) argue that signaling theory functions to describe behavior when there are information asymmetries between two parties. However, little research exists on the signaling of start-ups and ventures towards small investors, meaning the practice of crowdfunding. In the case of crowdfunding, the entrepreneur, which is the sender, must decide upon whether and how to communicate information. The potential investor, which is the receiver, must choose how to interpret the communicated information. In the end this might impact the success of the crowdfunding campaign. There are many observable factors, which can influence the chance of a project to succeed. In this research, the observable factors that will be studied are the social network of the founder(s) or project itself as well as the social interactions about the project. "Different to conventional investors in venture capital firms, customers who have invested a project may also be likely to promote the project among his/her friends through online social networks" (Lu et al., p.573, 2014). "A social network is a set of socially-relevant members connected by one or more relations" (Marin & Wellman, 2009). Social interactions involve communications between participants in a certain context.

The research question of this paper is therefore: *What is the influence of a social network and social interactions on crowdfunding performance?*

The research that focuses on these factors in order to explain success of a crowdfunding campaign provides striking outcomes. On the one hand, some researchers argue for a positive effect on the success of a crowdfunding campaign. The research conducted by Mollick (2014) offers a description of the underlying dynamics of success and failure among crowdfunded ventures. It suggests that, amongst others, personal networks have the ability to influence the success to receive entrepreneurial finance. More concrete, this study suggests that a large number of friends on online social networks are associated with success. Besides, it was studied that social interactions, such as frequent updates are associated with greater success. Furthermore, Mollick (2014) considered producing a video as an indicator of a higher quality project as it signals at least minimum preparation. This study was based on data from the crowdfunding platform Kickstarter. Moreover, Hekman and Brussee (2013) also studied the influence of a social network and media activities on the success of a crowdfunding campaign at Kickstarter. Their results regarding the role of the social network suggest that successful initiators on Kickstarter have more friends but a sparser network, however the effect is small. The research conducted by Zheng et al., (2014) studied how an entrepreneur's social network has an influence on crowdfunding. This study was based on social capital theory and used data from the U.S. and China. Based on their study they suggest that an entrepreneur's social network ties had significant effects on crowdfunding performance in both countries. The data regarding the U.S. was again retrieved

from the platform Kickstarter, and the data regarding China was retrieved from the platform Demohour. The effects were stronger in China than in the U.S., which can explain the higher predictive overall power of this study, as the findings of the other U.S. focused studies were lower. On the other hand, the study conducted by Ahlers et al., (2015) examined the influence of social capital on fundraising success and concluded that it has little or no impact. This study used the ASSOB Australian platform as the source of their data sample. The differences in outcomes can result from the different platforms, which is important to realize when generalizations are made. This paper intends to add to the existing research in this field by analysing the relationship of a social network and social interactions on crowdfunding success amongst different crowdfunding platforms in Europe.

First, this paper will explain the phenomenon crowdfunding and its different models that determine the ways in which crowdfunding operates. Then the motives for both founders and funders will be discussed. After that the theory of social capital and its implications regarding crowdfunding will be discussed. The same will be done for social interactions regarding the crowdfunding campaign. The paper will proceed with a description of the nature of the crowdfunding data that is used for analyses. Thereafter, the paper will provide and analyse the data of the study. In the end, there will be a conclusion and discussion.

# 2. LITERATURE REVIEW

## 2.1. What is crowdfunding?

A definition of crowdfunding is: "an open call, mostly through the Internet, for the provision of financial resources either in the form of donation or in exchange for the future product or some form of reward to support initiatives for specific purposes" (Belleflamme, Lambert and Schwienbacher, 2014). The purpose of a crowdfunding campaign ranges from new venture and products development, the creation and production of cultural goods, to good causes such as charity and local government projects. In addition to approaching friends and family, anyone that is interested in the crowdfunding project belongs to the entrepreneur's target group (Hekman and Brussee, 2013). The crowdfunding platform acts as an intermediary who arranges the match between the investor and the entrepreneur (Burkett, 2011). There are different types of investment models that determines the way in which crowdfunding is manifested. First, the type of fundraising can be direct or indirect. With direct fundraising, the entrepreneur uses their own platform e.g. their website or their own crowdfunding platform, in order to find investors for their project. With indirect fundraising, the entrepreneur uses an external crowdfunding platform that acts as an intermediary for many more projects. The main difference between direct and indirect crowdfunding is the type of audience that is targeted. With direct crowdfunding the entrepreneur seeks funds from a more known public than with indirect crowdfunding. Secondly, the type of investment determines the nature of crowdfunding. With Ex post funding the project is already under construction and there is often an existing prototype or blueprint that specifies the project. With Ex ante funding the project has not been completed before the entrepreneur seeks funding. Thirdly, the different pay-out modes or business models differentiate crowdfunding projects. With the Keep it all model the entrepreneur receive all the money invested even if the crowdfunding project turned out unsuccessful. With the All or nothing model, the entrepreneur only receives the money invested when the crowdfunding project turned out to be successful. The Club model attempts to make investors club members in order to avoid regulations

while providing securities. The Holding model involves creating a subsidiary holding firm that acts as the single investor for the venture that needs to be financed. The holding firm then controls, allocates and distributes the funds raised from investors (Tomczak & Brem, 2013). Lastly, there are different types of investment models of crowdfunding. Each type of investment model is different by what the investor receives from the entrepreneur after funding a crowdfunding project. There are five categories, namely a donation, reward, lending and equity model. The donators or investors do not receive material rewards via the donations model; instead they receive immaterial, social rewarding in return for their contributions. This type of crowdfunding is mostly used for charities and non-profit institutions, whereas businesses rarely use this type of fundraising. The reward model includes both, material and immaterial rewarding. This form is very common. The investor receives some sort of "reward" other than interest or a percentage of profit. The lending model, in other words debt crowdfunding is also quite popular. Investors loan the entrepreneur money and expect repayment after a certain period, including or excluding interest. Lastly, the equity model allows investors to buy shares of the fundraised company. Thus, this form offers the investor a share of the profits of the company (Bouncken et al., 2015; Griffin, 2012).

## 2.2. Motivations and deterrents for founders
Costs of capital, control, trust and other opportunities are factors that act as motivations and deterrents for founders.

### 2.2.1. Costs of Capital
First, the cost of capital for an entrepreneur using crowdfunding involves the costs of using the platform (e.g. entrepreneurs at Doorgaan.nl need to pay a initial fee and a success fee). Second, the time and resources in order to manage the crowdfunding project add to the cost of capital. Third, the (monetary) reward to the investors is part of the cost of capital (Hollander, 2015). A reason for entrepreneurs to promote their project on a crowdfunding platform is the lower cost of capital. As Agrawal et al., (2011) found, with crowdfunding the access to capital is to a lesser extent influenced by the creator's location. Entrepreneurs can try to find potential investors on a global level. Gerber et al., (2012) found that entrepreneurs sometimes perceive raising $1 from a million people to be easier than raising $1,000,000 from one person or an organization. Besides, investors often value non-monetary rewards as recognition or happiness about the fact that they were able to help and part of the project. Furthermore, crowdfunding usually provides more information about the project and creator and this in turn increases the willingness for funders to pay, which can lower the cost of capital as well. Information can include interest from other investors, ideas for product modifications and extensions from potential users. However, when the information is negative, the adverse is also true (Agrawal et al., 2013).

### 2.2.2. Control
Crowdfunding gives entrepreneurs the chance to maintain more control over their project than when using other financing methods. The control is different for the varying crowdfunding methods. With equity crowdfunding, funders do have a share of the company and some control of the entrepreneurs will be transferred to the investors who will have a say regarding the direction and operations of the company. For the donation, reward and lending crowdfunding models entrepreneurs ask for funds without giving up project ownership (Gerber and Hui, 2013; Gerber et al., 2012; Hollander, 2015).

### 2.2.3. Trust
Entrepreneurs do consider trust issues with crowdfunding. Two types of trust issues do often play a role regarding crowdfunding. First, failure to raise funds can harm the projects or venture's image, since this indicates that the project or venture is not worthwhile. As a consequence, other forms of funding, such as bank loans and angel investors might be harder to achieve. Besides, many people of the entrepreneur's social network, which represents a large part of the investors, (mainly in the beginning of the funding period) are aware of the failure and this can result in a bad reputation for future projects. Secondly, crowdfunding attempts to reach many small investors and therefore, entrepreneurs need to disclosure information about the project in order to attract funders. This has the potential of competitors copying entrepreneur's ideas. Also, others who have funding available might launch failed projects, or build upon their ideas (Gerber and Hui, 2013; Hollander, 2015).

### 2.2.4. Opportunities
Other reasons to participate in crowdfunding include the opportunity to connect with others, gain approval, the advantages of market research, and the opportunity to learn and improve by using the wisdom of the crowd. The project will be pitched or explained to many investors looking for valuable products, services or ventures. Hereby, potential markets, product demand and feedback can be derived (Gerber and Hui, 2013; Hollander, 2015).

## 2.3. Motivations and deterrents for funders
(Financial) rewards, participation in community, supporter of ideas and trust issues are factors that act as motivations and deterrents for funders.

### 2.3.1. (Financial) rewards
Rewards can be a motivator for investors to choose for investing in a crowdfunding initiative. Rewards include products, services, interest, shares, and immaterial social rewarding such as a grateful "thank you". Often, investors that choose to invest their money via a crowdfunding platform do appreciate immaterial rewards more than financial returns. The rewards can also have a deterrent effect for investors to choose for a crowdfunding campaign. Research indicates that rewards are frequently offered with a delay (Mollick, 2014; Belleflamme and Lambert, 2014). For example, research by Mollick (2014) shows that for the Design and Technology category of Kickstarter projects, only 24.9% of projects delivered the associated rewards on time.

### 2.3.2. Participation in community
For some investors it is a motivation to invest money in a crowdfunding project, because they value the feeling of being part of a community. Most platforms display names of funders next to the project campaign. In this way, supporters can easily see who else has funded the same idea (Gerber and Hui, 2013).

### 2.3.3. Supporter of ideas
Not all investors are motivated by rewards. Intrinsic motivation can also persuade investors to fund a certain project. This is often related to the identity of the investor. Investors often support projects that are consistent with their (desired) identity. By supporting such a project, investors can express their beliefs, values and preferences (Gerber and Hui, 2013).

*2.3.4. Trust*
Fear of fraud is an issue related to crowdfunding. Many problems are associated with information asymmetry as well as conflicts of interest. Here, the agency theory comes into play. With crowdfunding, investors are afraid that entrepreneurs will misuse their funds (Thomson and Conyon, 2012; Hollander, 2015).

## 2.4. Social capital: the structural dimension of social network ties

Social capital is a multidimensional concept that consists of three dimensions, namely a structural, relational and cognitive dimension. The structural component means that social network ties are the basis for the development and utilization of social capital. The relational dimension suggests that the obligations, expectations and trustworthiness of the social network can work positive in reaping the benefits of social capital. The cognitive dimension refers to the capital derived from shared meaning made up of shared language and schema, as well as shared narratives. The concept of multidimensional social capital is often used to explain a member's motivations and behavior in online communities (Nahapiet & Ghoshal, 1998; Zheng et al., 2014). Social capital is inherent to the structure of relations between and among actors. The source of social capital is thus a social network wherein social capital is embedded (Coleman, 1988). "Social capital exists of resources embedded in one's social network, resources that can be accessed or mobilized through ties in the networks" (Lin, 2008). Regarding crowdfunding, those resources could be access to information, knowledge, finance, skills, and social legitimacy (Klyver & Hindle, 2007). This indicates that entrepreneurs with a strong social network can share information about their project much easier. According to Ahlers et al., (2015), networks and business linkages are important channels through which firms can access valuable information as well as financial resources. Regarding crowdfunding, two types of social networks do exist. On the one hand, there is the social network that an entrepreneur develops in social network communities next to the crowdfunding platform. For example, Facebook, Twitter and LinkedIn belong to this type of social networks. On the other hand, there is the social network as a result of the crowdfunding platform community where the entrepreneur is embedded in. Both types of social networks can help the entrepreneur in finding sponsors for their crowdfunding campaign (Nahapiet & Ghoshal, 1998; Zheng et al., 2014). Seghers (2012) suggests another benefit that entrepreneurs can reap from social capital. Entrepreneurs with a strong social network in the financial community have a greater knowledge of financial alternatives as crowdfunding, which enhances the probability of using crowdfunding in first instance. Based on the theory about social networks and social capital the following hypothesis will be tested:

*H1: The social network size of entrepreneurs is positively related to the success of the project.*

## 2.5. Social interaction

Gerber et al., (2012) identified the stages an entrepreneur needs to go through in order to launch, manage and finish a crowdfunding campaign successfully. It involves understanding the opportunities and responsibilities, preparing the campaign material, testing the campaign material and initial project prototypes, marketing the project, executing the project goals, and contributing knowledge back to the crowdfunding community. These steps recognize the importance of social interaction with the (potential) investors. Here, the marketing function comes into play. Crowdfunding platforms use social media (e.g. Facebook) and video sharing platforms (e.g. YouTube) to raise awareness. During the different stages identified by Gerber et al., (2012), social interaction manifests itself in different ways. When starting a crowdfunding campaign on an online platform, entrepreneurs need to create a project profile, including a title, project description, funding goal, campaign duration, rewards, and often a video or picture. Zheng et al., (2014) used the length of the description of a crowdfunding project as a measure of the shared meaning of a crowdfunding project. They saw it as an important narrative of a project that was shared with the sponsors. The shared meaning of a project can also be enhanced through the availability of a video. The project profile is the first interaction or communication about the project with the potential funders. After this preparation, the testing phase enters where entrepreneurs ask family and friends from their close social network how they can improve their initial project profile. Next, the project needs to be marketed. Entrepreneurs often start with reaching their personal network for initial support. Besides asking their personal network for funding, entrepreneurs ask their personal network to spread information about the (crowdfunding) project to others. Publicity efforts include reaching out to personal networks online via social media as Twitter and Facebook as well as reaching out to personal networks offline by for example worth-of-mouth marketing. Also, during the project campaign, entrepreneurs post comments and updates about the project in order to engage and motivate (new) funders to invest. By doing this, entrepreneurs can maintain supporter relations and create a reputation as a responsible and accessible entrepreneur. An example from practice is the case of TrackR Bravo team who placed their crowdfunding campaign on the platform Indiegogo.com. They provided the (potential) investors with informative, regular updates. Mainly because of this, they raised over $1.7 million for their tracking device ("TrackR bravo - The Thinnest Tracking Device. Ever.", 2016). In the phase of executing the project goals, rewards will be sent to the investors. After this, it is still important to communicate with the investors by contributing knowledge back to the community. For example, writing a blog to share advice on the crowdfunding experience (Gerber et al., 2012). Based on the literature about social interactions or communications, the following hypotheses will be tested:

*H2: The number of updates plus comments is positively related to the success of the project.*

Mollick (2014) considered producing a video as an indicator of a higher quality project as it signals at least minimum preparation. Zheng et al., (2014) indicated that the shared meaning of a crowdfunding project also has a positive influence on the success of the project. The shared meaning can be enhanced through a project video. Therefore the relation between the (non)-existence of a project video and the success of the crowdfunding project will be tested.

*H3: The availability of a project video is positively related to the success of the project.*

*Tips from the crowdfunding platforms under study!*

Crowdfunding platforms recognize the strength of social communications and a social network as important in order to

succeed. KissKissBankBank for example offers a guide for entrepreneurs on how to promote a crowdfunding project successfully. Their advice is to create excitement or stimulus amongst (potential) investors regularly and via the right tools. *"Being visible on KissKissBankBank is good, but the contributions will not drop from the sky"*. Reaching as much as possible (potential) investors is the main aim of the entrepreneur. The platform KissKissBankBank explains the entrepreneur's community as a circle with three different groups the entrepreneur aims to reach. First of all, the entrepreneur needs to reach their close friends and family. This is not only important to raise funds, but the social network of close friends and family will be important to reach other people, meaning friends of your friends. This group presents the second circle and is more numerous than the first one. Facebook is a right tool in order to reach the first and second circle. This can be in the form of a specific page dedicated to the crowdfunding project or by promoting the crowdfunding project via an organizational or personal Facebook page. The third circle covers the wider public. This group can be reach via media close to the project's interest. It is most effective to approach this group when the project campaign has already raised some funds. *"Success brings success!"* The higher the goal amount of money, the more important it often is to reach more than only your close friends and family ("Promoting your project efficiently — KissKissBankBank", 2016).

The crowdfunding platform Doorgaan also offers information about important factors that entrepreneurs need to consider during the preparation, the start and the campaign period. Social communications and social network are again mention as important. The platform stresses the importance of getting your whole network acquainted with the project campaign. Social media accounts included in the project campaign can be used for that. The Amserfoortse, a Dutch insurance organization owns Doorgaan and promotes the projects at Doorgaan via Facebook in order to help the entrepreneurs to increase the number of people they reach with their project. People can choose to invest by themselves or to like/and or share the project whereby the Amersfoortse invests a certain amount of money. Via this way, the Amersfoortse stimulates the project to reach a big audience (Alles over Doorgaan.nl, 2015).

Voordekunst also mentions the importance of getting attention for your project before, but also during the project campaign. Tips from Voordekunst are to be active on social media as well as talking to people in real life about the campaign ("voordekunst - Crowdfunding voor de creatieve sector", 2016).

Oneplanetcrowd not only motivates the entrepreneur to communicate to their social network, but also stresses the importance of investors to share the crowdfunding campaign with as many people as possible through e.g. Facebook to help increase the chance of success even more ("Together we fund the future", 2016).

## 3. RESEARCH METHOD
### 3.1. Data collection and Research model
I collected data from www.doorgaan.nl, www.oneplanetcrowd.nl and www.voordekunst.nl in The Netherlands. Besides, data from the France platform www.KissKissBankBank.nl was collected. Investors at Doorgaan.nl receive different non-financial rewards for different amounts of money invested. In this way, enhanced experiences or benefits to different groups of investors are offered. Doorgaan.nl is founded in 2014 and uses the non-financial reward model for starting and existing ventures. They do not charge their investors for investments made at the crowdfunding platform. However, entrepreneurs need to pay an initial fee and success fee. Oneplanetcrowd is a platform that focuses on innovation and sustainability. The platform is launched in 2012 and offers the investor the choice of a loan, equity, donations or reward investment model. The investors do not have to pay for their investments made. The entrepreneur needs to pay a contribution fee, transaction costs and a percentage over the goal amount of money. Investors at Voordekunst also receive non-financial rewards for different amounts of money invested. Voordekunst is founded in 2011 and uses the non-financial reward model for starting and existing ventures. Again, investors are not charged for investments made, while entrepreneur pay a contribution fee as well as a percentage over the amount of money raised for successful projects. Kisskissbankbank.com is founded in 2010 as a platform that facilitates the funding process for entrepreneurs with a great idea. Investors at Kisskissbankbank.com receive a non-financial reward that is defined by the entrepreneur. Entrepreneurs at Kisskissbankbank.com need to pay a fee percentage of the amount of funds raised as well as secured transactions costs. Investors do not have costs involved with funding. These platforms provide the data needed.

These platforms are chosen to study based on the availability of data as well as the similarities amongst these platforms. The differences in motivations of investors to choose for one of the platforms under study are mitigated as a consequence of the similar investment models the platforms apply. All four platforms act as intermediaries to accommodate indirect fundraising. Furthermore, ex post fundraising is guaranteed. KissKissBankBank for example requires the projects to be creative. They do not accept personal projects as holidays, weddings and birthdays. Doorgaan also checks the projects before they can be launched based on the viability of the project. Oneplanetcrowd carefully screens projects before approval, because they only want projects with high quality. Voordekunst does not mention a screening procedure, however approximately 80% of the projects on their website do succeed, indicating high quality as well. The pay-outmode that the four platforms do adopt is the all or nothing model. If the entrepreneur does not reach 100% of the goal and has been run out of time, the contributors do get refunded for the amount they have invested. Lastly, all four platforms do apply the non-financial reward investment model. At the platform oneplanetcrowd they do offer more investment models, including the loan and equity investment model. However, as I want to mitigate the differences between the platforms studied, only projects that offer non-financial rewards are included in the sample (Ambani, 2014; Doorgaan.nl, 2016; Voordekunst, 2016; KissKissBankBank, 2016; Oneplanetcrowd, 2016).

For data analysis this study tests whether a relation exists between the number of Facebook friends or likes and the success of the crowdfunding project. Furthermore, relationships between the number of updates plus the number of comments on the one hand and the success of the project on the other hand will be tested. In order to analyze the relation between the independent and dependent variables, a multiple linear regression analysis needs to be conducted.

**Descriptive Statistics**

| | N | | Mean | Median | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| | Valid | Missing | | | | | |
| Number of Backers | 137 | 5 | 59,47 | 47,00 | 46,701 | 2 | 221 |
| Money Pledged (€) | 140 | 2 | 9,804.13 | 3,842.00 | 17,117.635 | 20 | 119,450 |
| Success Ratio (%) | 137 | 5 | ,8733 | 1,0200 | ,43576 | ,01 | 1,81 |
| Comments&Updates | 133 | 9 | 20,48 | 13,00 | 20,829 | 1 | 107 |
| Social Network Size | 114 | 28 | 1143,37 | 391,00 | 3014,507 | 14 | 26098 |
| Money Goal (€) | 132 | 10 | 8,776.14 | 5,000.00 | 10,180.022 | 500 | 52,000 |

**Table 1 Descriptive Statistics**

**Correlations**

| | | Number of Backers | Money Pledged (€) | Success Ratio | Comments&Updates | Social Network Size | Money Goal (€) |
|---|---|---|---|---|---|---|---|
| Number of Backers | Pearson Correlation | 1 | | | | | |
| | Sig. (2-tailed) | | | | | | |
| | N | 137 | | | | | |
| Money Pledged (€) | Pearson Correlation | ,452** | 1 | | | | |
| | Sig. (2-tailed) | ,000 | | | | | |
| | N | 137 | 140 | 137 | | | |
| Success Ratio (%) | Pearson Correlation | ,517** | ,196* | 1 | | | |
| | Sig. (2-tailed) | ,000 | ,022 | | | | |
| | N | 134 | 137 | 137 | | | |
| Comments&Updates | Pearson Correlation | ,629** | ,399** | ,301** | 1 | | |
| | Sig. (2-tailed) | ,000 | ,000 | ,001 | | | |
| | N | 130 | 133 | 130 | 133 | | |
| Social Network Size | Pearson Correlation | ,033 | -,001 | ,053 | ,080 | 1 | |
| | Sig. (2-tailed) | ,733 | ,995 | ,584 | ,412 | | |
| | N | 112 | 114 | 111 | 107 | 114 | |
| Money Goal (€) | Pearson Correlation | ,237** | ,651** | -,260** | ,308** | -,075 | 1 |
| | Sig. (2-tailed) | ,007 | ,000 | ,003 | ,000 | ,443 | |
| | N | 129 | 132 | 129 | 125 | 106 | 132 |

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

**Table 2 Correlations**

The model that will be tested is:

Success of the crowdfunding project = $\alpha$ + $\beta1$*Number of Facebook Likes/Friends + $\beta2$*Number of Project Updates + Number of Project Comments + $\beta3$*Goal amount of money + $\varepsilon$

The control variable is the goal amount of money. The platform name was used as a dummy variable in order to see whether differences occurred between platforms. The research model is based on the literature of Zheng et al., (2014), Mollick (2014) and Hekman and Brussee (2013). The descriptive statistics of the data are shown in Table 1 and the correlations in Table 2.

The data set needs to be suitable for the regression analysis, meaning that all the conditions are met. First of all, the quantitative variables condition is met since the number of Facebook Likes/Friends, the number of project updates, the number of project comments all are variables in which the numbers act as numerical values. Secondly, the straight enough condition checks for a linear relationship. The relationships between the independent and dependent variables are tested through scatterplots. I assume a linear relationship between de independent and dependent variables, although some scatterplots show little linearity. For some of these relationships I re-expressed the data in order to make the form of the scatterplot straighter.

Still the models are not perfect, but re-expressing the data by taking the square root resulted in a more useful model. After this, the residuals plot for the independent and dependent variables will be checked. The more or less horizontal direction, shapeless form, and roughly equal scatter for all predicted values suggest the linear model to be appropriate. Thirdly, by checking the outlier condition the linearity increased as well. Points with large residuals or high leverage can influence the regression model significantly. By adding and removing them I checked the impact of the outliers on the regression model. Extreme values that resulted in a different regression model are omitted. Fourthly, the data shows homoscedasticity as there is no real pattern in the plot were the standardized residuals are regressed on to the standardized predicted value. Fifthly, I checked for multicollinearity to make sure that the independent variables are not highly correlated with each other. There seems to be no problem of multicollinearity as the VIFs for all the variables were less than 2. Lastly, I assume the variables to be normally distributed. For checking this, I also used the re-expression of the data by taking the square root and logs. This makes the distribution of the variables more symmetric and thus leads to a more useful regression model with the values for the Shapiro Wilk test being significant (De Veaux, Velleman, & Bock, 2013; "How to perform a Multiple Regression Analysis in SPSS Statistics | Laerd Statistics", 2016).

Next to this regression model, a two-sample t-test was conducted in order to see whether the mean of the performance measures are different between certain groups. Entrepreneurs

can chose whether or not to upload a project video at their project campaign. A t-test will test whether the mean of certain success criteria is higher for projects that have uploaded a video or not. The assumptions for this two-sample t-test are satisfied.

First, the independence assumption requires the data in each group to be independent of each other. This is accounted for, as the success of one project does not depend on the success of another project. Second, the randomness assumption is checked for as the data was collected with randomization. I did not selected projects based on the (non)-existence of a project video at their project campaign. Third, the nearly normal assumption is fulfilled as I believe both groups to be large enough based on the Central Limit Theorem (with a video N= 94 and without a video N=46) (De Veaux, Velleman, & Bock, 2013).

### 3.2. Measures
The data needed about a given project includes (1) name of the project, (2) category of the project, (3) funding period, (4) amount of money successfully raised, (5) the goal amount of money, (6) number of backers, (7) number of Facebook likes/friends, (8) number of updates, (9) the number of comments and (10) the availability of a project video.

The dependent variable will be the success of the project and will be measured by the amount of money raised as a percentage of the goal amount of money (Zheng et al., 2014; Belleflamme, Lambert and Schwienbacher, 2014). Next to this measurement of success, the total amount of money pledged as well as the number of backers will be used as success measurements. These different success indicators are not necessarily independent: a greater number of backers will likely lead to a greater amount pledged (Hekman and Brussee, 2013). The success indicators were retrieved directly from the project campaign. There can be some error in the number of backers as the investors can make more than one investment and this can lead to a higher number of backers then in reality. However, I assume this to happen at random. The independent variables will be (1) the number of Facebook friends/likes of entrepreneurs, (2) number of updates, (3) the number of comments and (4) the availability of a project video. When the project provided a link to a personal, project or organizational Facebook account or page, the number of likes or friends was retrieved (Hekman and Brussee, 2013). Only projects that ended in a time period of June 2015 till June 2016 are considered. The possibility of an increasing number of Facebook friends as a consequence of the success of a crowdfunding campaign or other causes is then likely to be reduced. Zheng et al., (2014) used the length of the description of a crowdfunding project as a measure of the shared meaning of a crowdfunding project. They saw it as an important narrative of a project that was shared with the sponsors. The shared meaning of a project can also be enhanced through the availability of a video. The number of information posts about the projects measures the updates. "Updates represent efforts by founders to reach out to current and potential funders, and to inform interested backers about developments in a project" (Mollick, 2014). The comments posted by funders or potential funders often express enthusiasm or displeasure about the project (Mollick, 2014). This can also act as a way of communication between entrepreneurs and funders as they often interact there by responding to certain comments. The number of updates and comments were retrieved directly from the project campaign. The number of updates and comments were only counted if it was placed before the end date of the project. The control variable, meaning the goal amount of money as well as the dummy variable of the platform name was directly retrieved from the project campaign.

### 3.3. Data analysis and results
The regression results are presented in Table 3. The results on the relationship between the social network size of the entrepreneur or project or organization did not turned out to have a significant effect on one of the performance criteria, since all p-values are >0.05. The results show that one's social network ties has no or a small negative effect on the success of a crowdfunding campaign, which is inconsistent with previous studies mentioned earlier. However, the result is not significant. Therefore, H1 was not supported.

The results confirmed the significant effect of the positive relationship between social interactions in the sense of updates and comments on crowdfunding performance. For the effect on the number of backers as performance criteria the p-value is <0.001 with b= 3.598. For the effect on the amount of money pledged as performance criteria the p-value is <0.001 with b= 0.493. For the effect on the success ratio as performance criteria the p-value is <0.001 with b= 0.518. Therefore, H2 was supported.

The predictive powers are also shown in Table 3. The predictive power for the effect on the number of backers as performance criteria the adjusted R square was 0.387. For the effect on the amount of money pledged as performance criteria the adjuested R square was 0.562. For the effect on the success ratio as performance criteria the adjusted R square was 0.302.

Based on these results, entrepreneurs can use social interactions in the form of posting updates and interacting via comments in order to increase the likelihood of succeeding. In this way, the social interactions increase the chance of success, where the unobservable subjective quality of a crowdfunding project lies its foundations.

Since the sample under study consists of different platforms, it is interesting to see whether the regression results do differ amongst the different platforms. The regression results of the independent variables of the number of comments and updates and social network size on the dependent variable the number of backers for the different platforms are shown in Table 4. For the platform Voordekunst there are not enough projects to be able to perform regression on that sample only. The results show that for the platforms Doorgaan en KissKissBankBank separately the number of comments and updates are significantly related to the number of backers, whereas the social network size for both platforms is not significantly related to the number of Backers. For the platform Oneplanetcrowd the results are not significant for both independent variables. This can indicate some differences, however the lower sample size can also play a role here.

| | | Regression results | | | |
|---|---|---|---|---|---|
| Model | Independent Variable | B | SE | Adjusted R square | N |
| 1 | Comments&Updates | 3.598*** | .555 | | |
| | Social Network Size | .008 | .011 | .387 | 102 |
| | Money Goal (€) | 1.366 | .589 | | |
| 2 | Comments&Updates | .493*** | .078 | | |
| | Social Network Size | -.002 | .002 | .562 | 99 |
| | Money Goal (€) | .598*** | .084 | | |
| 3 | Comments&Updates | .518*** | .097 | | |
| | Social Network Size | -.001 | .002 | 0.302 | 96 |
| | Money Goal (€) | -.512*** | .084 | | |

Model 1: Dependent variable: Number of Backers

Model 2: Dependent variable: Money Pledged (€)

Model 3: Dependent variable: Success Ratio (%)

** p<0.01

*** p<0.001

**Table 3 Regression results**

| | | Regression results for different platforms | | | |
|---|---|---|---|---|---|
| Crowdfunding Platform | Independent Variable | B | SE | Adjusted R Square | N |
| Doorgaan | Comments&Updates | 0.950*** | .095 | | |
| | Social Network Size | -.005 | .003 | .764 | 31 |
| | Money Goal (€) | -.355** | .118 | | |
| KissKissBankBank | Comments&Updates | .708*** | .142 | | |
| | Social Network Size | -.001 | .002 | .357 | 45 |
| | Money Goal (€) | -.580** | .179 | | |
| Oneplanetcrowd | Comments&Updates | .772 | .315 | | |
| | Social Network Size | .029 | .017 | .352 | 15 |
| | Money Goal (€) | -.41 | .410 | | |

**p<0.01

***p<0.001

One model with dependent variable Number of Backers

**Table 4 Regression results for different platforms**

| | | Two-sample t-test | | | |
|---|---|---|---|---|---|
| Model | (Non)-existence of a Video | N | Mean | SE Mean | F |
| 1 Video | | 92 | 67.87 | 5.082 | 6.589** |
| No Video | | 45 | 42.29 | 5.532 | |
| 2 Video | | 94 | 12,818.17 | 2,059.423 | 16.555*** |
| No Video | | 46 | 3,645.00 | 713.283 | |
| 3 Video | | 93 | .8769 | .04388 | 0.795 |
| No Video | | 44 | .8657 | .07029 | |

Model 1: Dependent variable: Number of Backers

Model 2: Dependent variable: Money Pledged (€)

Model 3: Dependent variable: Success Ratio (%)

**p<0.01

***p<0.001

**Table 5 Two-sample t-test**

The results of the two-sample t-test are shown in Table 5 for the dependent variables number of backers, amount of money pledged and success ratio respectively. The outcomes show that for the dependent variable of the number of backers the mean for the group of projects that have uploaded a project video next to their project campaign is higher than for the group that did not upload a project video. This difference was significant with a p-value of 0.01. For the dependent variable of the amount of money pledged the mean for the group of projects that have uploaded a project video next to their project campaign is again higher than for the group that did not upload a project video. This difference was significant with a p-value of 0.000. For the dependent variable of the success ratio the mean for the group of projects that have uploaded a project video next to their project campaign is slightly higher than for the group that did not upload a project video. However, the difference is not significant with a p –value of 0.374. Based on these outcomes the existence of a video seems to have a positive effect on the number of backers and the amount of money pledged as success indicators, while it does not seems to effect the success ratio significantly.

The results do somewhat differ from the results of other studies. Zheng et al., (2014) found a significant positive relationship between the social network ties (number of Facebook on crowdfunding performance. Also, Hekman and Brussee (2013) found a positive relationship between the success and the number of friends. However, the effect was small. Moreover, Mollick (2014) also found that large number of friends on online social networks was associated with success. These results do differ with the results of this study. This can be caused by different platforms that were studied. On the other hand, Mollick (2014) found that social interactions, such as frequent updates, comments as well as the existence of a project video were associated with greater success. This is verified by this study as this research also shows a significant positive relationship between the number of updates and comments on the one hand and the success of a crowdfunding campaign on the other hand. Also, the existence of a project video was associated with higher project success in this study.

## 4. DISCUSSION

### 4.1. Implications for practice
The outcomes of the research provide several practical implications. For crowdfunding platforms it is important to organize the platform in such a way that entrepreneurs can communicate well with the (potential) investors. As the outcomes of this research suggest, doing so will increase the likelihood of succeeding their crowdfunding campaign. Furthermore, entrepreneurs may get more insights on the importance of their social network and social interactions on the success of their project, which they can use to increase their ability to receive funds. As the outcomes suggest, entrepreneurs can increase the success of a crowdfunding campaign by interacting with their (potential) investors. However, the social network size does not seem to be significantly related to the success of a crowdfunding campaign.

### 4.2. Limitations
One of the limitations of this research is that social capital is measured via one of the three dimensions, namely the structural dimension consisting of the number of social network ties. The other two dimensions including the relational and cognitive dimension can result in social capital as well. The study only focused on the social network that an entrepreneur develops in social network communities next to the crowdfunding platform. The social network as a result of the crowdfunding platform community where the entrepreneur is embedded in is not considered. Hence, the degree of social network ties is only measured via the social media community Facebook. Other social networking communities such as LinkedIn are not considered, as they often were not linked to the project campaigns under study. Furthermore, unobservable and subjective possible moderating variables such as the uncertainty or the viability of the crowdfunding project are not considered. Also, This paper only focuses on reward-based and donation-based crowdfunding, while other forms of investment models are not taken into account. Therefore, one should be careful when making generalizations. Lastly, the sample size of 140 projects in total is was quite small.

## 5. ACKNOWLEDGEMENTS

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