

SUCCESS DRIVERS OF REWARD-BASED CROWDFUNDING CAMPAIGNS

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Abstract: *While the crowdfunding phenomenon has attracted considerable practitioner and scholarly attention, existing research does not allow us to fully understand the determinants of crowdfunding campaigns performance. This is a key question within crowdfunding research to date.*

Using the most popular crowdfunding platform in Portugal (PPL crowdfunding), we constructed a data set to capture campaign characteristics and funding outcomes. We focused on 347 PPL campaigns initiated and ended in 2017 to test our hypotheses. Data were compiled from campaign descriptions and final result appearing on the PPL platform. This platform uses a rewards-based model where founders receive tangible, nonmonetary rewards for their contributions, often in the form of products /services, or tokens of appreciation such as thank you notes.

Using a binary logistic regression model this paper investigates the factors driving a campaign's success. Such factors include project goal (euros), duration of campaign, facebook shares, geographic distance, project comments, communication quality, type of founders and number of backers. The dependent variable is a dichotomous variable (0/1) that indicates whether a project has received the full target amount. We use this success indicator to assess whether projects that received full funding generally differ significantly from projects that did not.

Our results highlight the importance of some variables related to the project and the role of social networks on funding success rewards-based crowdfunding. These conclusions offer new insights into the dynamics of rewards-based crowdfunding.

Key words: *crowdfunding; rewards-based crowdfunding; success prediction; entrepreneurial finance.*

1. INTRODUCTION

In the summer of 1885, the Statue of Liberty was in pieces in New York, with no funding to stand on a pedestal. So Joseph Pulitzer decided to launch a fundraising campaign in his newspaper The New York World. The campaign raised money from more than 160,000 donors with more than three quarters of the donations, totaling less than a dollar. In just five months, The New York World grossed \$ 101,091 - enough to cover the last \$ 100,000 to complete the pedestal. If launched today, the campaign would be a classic crowdfunding project, such as those run online by existing platforms around the world. He used the paper to raise money from a very large group of donors, each promising only a small money exchange. In a similar vein, artists, musicians, small entrepreneurs, and others have long relied upon funding from various backers to produce new works. Rewards-based crowdfunding enables funders to obtain financial resources from the general public, via internet-based platforms, in exchange for some level of non-financial reward (Davis et al.,



2017). While the crowdfunding phenomenon has attracted considerable practitioner and scholarly attention, existing research does not allow us to fully understand the determinants of crowdfunding campaigns performance. This is a key question within crowdfunding research to date (McKenny et al., 2017). Thus, relatively little is known with regard to what drives the funding success of reward-based crowdfunding campaigns. Specifically, we seek to examine the factors driving a rewards-based crowdfunding success. To answer this research question, we using the most popular crowdfunding platform in Portugal (PPL crowdfunding), we constructed a data set to capture campaign characteristics and funding outcomes. This platform uses a rewards-based model where founders receive tangible, nonmonetary rewards for their contributions, often in the form of products /services, or tokens of appreciation such as thank you notes. The paper is structured as follows: Section 2 provides a brief overview of the study context. Section 3 presents a review of literature and the hypotheses to be tested. The data used, the statistical model and measurements of the variables are detailed in Section 4. The univariate and multivariate results of our data analysis are presented in Section 5. Section 6 provides conclusions.

2. STUDY CONTEXT

Important steps have been taken to introduce regulation of crowdfunding into the Portuguese legal system. First, with the publication of Law no. 102/2015, of August 24, that defined the legal regime for crowdfunding (LRC). In this law, crowdfunding is referred to as the type of financing of entities (or their activities and projects) through which any natural or legal person, national or foreign, obtains investment from one or more individual investors, using a crowdfunding platform. In LRC four different modalities of crowdfunding were established and regulated, namely: (i) Donation-based crowdfunding (ii) Reward-based crowdfunding; (iii) Equity-based crowdfunding; (iv) Lending-based crowdfunding. Law no. 102/2015 was subsequently supplemented by Administrative Rule no. 344/2015, of October 12, which established the rules applicable to the prior notification procedure for the start of activity of crowdfunding platforms through the means of Donation and Reward. More recently, the Portuguese Securities Market Commission approved CMVM Regulation No. 1/2016 where it defined the regime applicable to Equity-based crowdfunding and Lending-based crowdfunding. Notwithstanding this progress in building the legal framework for crowdfunding, legal and regulatory provisions for Equity and Loan crowdfunding platforms continue to await the publication of penal system appropriate to these modalities of crowdfunding.

The most popular crowdfunding platform in Portugal is PPL crowdfunding. This platform was founded in 2011 in Lisbon by four MBA students of different nationalities. PPL crowdfunding uses a rewards-based model where funders receive tangible, nonmonetary rewards for their contributions, often in the form of products / services, or tokens of appreciation such as thank you notes. The terms of funding follow an All-or-Nothing model and its activity is accredited by Crowdsourcing.org, the benchmark in the Crowdsourcing and Crowdfunding industry, according to CAPS (Crowdfunding Accreditation for Platform Standards). PPL is a founding member of the European Crowdfunding Network, whose main objective is to join efforts to promote this new tool at European level. In March 2018 the PPL crowdfunding website stated that since its inception € 2 731 738 has been raised with 73 805 individual contributions (€ 37 average support). In 1 800 projects launched since its inception, 830 campaigns were funded in an average period of 49 days. The success rate in PPL is approximately 45%. On average, the projects financed raised € 2 818. Until March 2018, the categories of initiatives that had raised a greater volume of funding were Music and Social.

3. LITERATURE REVIEW AND HYPOTHESES DERIVATION

Project goal. Literature suggests that influence of funding target on crowdfunding campaign success differs with model of crowdfunding. In the case of reward-based crowdfunding most studies indicate that higher funding goals are negatively associated with success (Belleflamme et al., 2014, Cordova et al., 2015, Cumming et al., 2014, Kuppuswamy and Bayus, 2013; Mollick, 2014, Zheng et al., 2014). Although we may admit that high funding targets may provide a sense of security in some funders, we believe that this effect is very small. Thus, in line with the results of previous studies, we have the following hypothesis:

H1: Smaller crowdfunding projects are more likely to be successfully funded than larger projects.

Geographic distance. The theory predicts that investors in entrepreneurial ventures in the early stage will tend to be local, to compensate costs of collecting information and monitoring progress (Florida and Smith 1993, Lerner 1995, Mason 2007). Likewise crowdfunding backers tend to support campaigns that are geographically close to them (Lin and Viswanathan, 2015). Mollick (2014) concluded that early contributions from local investors (eg. family and friends) can determine the pattern of subsequent contributions by more distant funders. However some authors devalue the geographic variable because online mechanisms can reduce economic frictions associated with financing in early-stage projects over long distances (Agrawal et al., 2011, Vulkan et al., 2016). Due to the cultural proximity existing as ex-Portuguese colonies our sample has campaigns that are destined to some of these African countries. These remote campaigns can exacerbate the doubts of funders as they cannot easily follow the development of projects. This mechanism is expected to work in our sample and we hypothesize that:

H2: Crowdfunding projects developed in Portugal are more likely to be successfully funded than projects located in ex-Portuguese colonies.

Duration of campaign. The duration of crowdfunding campaigns is determined in advance. Typically long campaigns durations are associated with greater visibility of the project and consequently better performance. However also may argue that very long campaign duration may be perceived as lacking in trust of founders. Results of empirical studies give reason for these two currents. Zheng et al. (2014) found that the duration of the campaign is positive related to success in rewards-based campaigns in China, while no significant relationship was confirmed for the United States. Other studies also found that project duration increases the chances of success in reward-based campaigns (Cordova et al., 2015, Burtch et al., 2013). On the other hand, the duration of the campaign is negatively related to success in studies conducted by Cumming et al., (2014); Kuppuswamy and Bayus (2013); and Mollick (2014). Our expectation is that the "visibility" factor of a longer duration can overcome the "lack of trust of founders" factor. Thus, we propose the following hypothesis:

H3: Crowdfunding projects with a longer duration (i.e., open for more days) are more likely to be successfully funded than those with shorter duration.

Project comments. During the project campaign some projects receive comments on the platform that can stimulate (new) funders to invest (Mollick, 2014). Antonenko et al. (2014) refer that the number of comments or founders updates on the project matter and point out that intensive communication positively impacts successful projects. Based on these previous results the following hypotheses will be tested:

H4: Crowdfunding projects that received comments on the platform are more likely to be successfully funded than those who have not commented.



Number of backers. Kuppuswamy and Bayus (2013) argue that a greater number of backers in rewards-based crowdfunding may lead other potential backers to think that they may not contribute to a project that has already received abundant support because they assume that others will provide the necessary funding. However the results of the empirical studies do not seem to corroborate this argument. Hoobs et al. (2016) confirmed that successful campaigns seem to attract more backers than campaigns that do not reach their target funding. Vulkan et al. (2016) concluded that successful campaigns have average five times more backers than unsuccessful projects. Our expectation is in line with these results. Thus, we have the following hypothesis:

H5: Crowdfunding projects that receive the support of a larger number of backers are more likely to be successfully funded than projects that receive support from fewer backers.

Communication quality. When starting a crowdfunding campaign on platform the founders need to create project profile including a title, project description, target funding, campaign duration and rewards. Communication on the platform can be improved by inserting photos and video.

Theories of communication have often been employed to understand entrepreneurial fundraising (Ahlers et al., 2015; Plummer et al., 2015). In the case of crowdfunding producing a video as an indicator of a higher quality project as it signals at least minimum preparation (Mollick, 2014). 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 video project. Parhankangas and Renko (2017) consider that key part of any crowdfunding proposal is a video pitch, in which the entrepreneurs present the project to be funded. By communicating effectively, founders can convince funders about their legitimacy and potential (Lounsbury and Glynn, 2001). Thus, we propose the following hypothesis:

H6: Crowdfunding projects with superior communication quality are more likely to be successfully funded than projects that have had inferior communication quality.

Facebook shares. Networks are important channels through which can access financial resources (Ahlers et al., 2015). In relation to crowdfunding there is the social network as a result of community crowdfunding platform where the entrepreneur is embedded in .This social network can help entrepreneur to find sponsors for his crowdfunding (Nahapiet & Ghoshal, 1998; Zheng et al., 2014). Belleflamme et al. (2015) states that ‘social buzz’ or ‘eWOM (electronic word-of-mouth) in the form of support that a particular campaign would receive on social networks (e.g., shares on Facebook, or tweets on Twitter) may be critical for the campaign success. They consider que some funders put more weight on recommendations they receive from friends in a social network than on general information of campaign. According this author “social buzz” may supplement adequately the campaign description that a founder would give on a crowdfunding platform. Agrawal et al. (2014) suggest that the evolution of a fundraising campaign depends on founder social ties. Mollick (2014) shows that a fundraisers number of Facebook connections (taken as a proxy for the size of a founder’s social network) are a good predictor of successful fundraising. Thies et al. (2014) analyzed the effects of “social buzz” on the likelihood of success of crowdfunded campaigns. Their data set combines information about projects proposed on Indiegogo and number of shares and tweets that these campaigns received, respectively on Facebook and Twitter. Their results show that “social buzz” (especially Facebook shares) positively influences project backing. Others author’s also agrees on the importance of social networks to collecting funds in crowdfunding models (Agrawal et al., 2011; 2013; Kuppuswamy and Bayus, 2013; Lin et al., 2013). Consequently, we hypothesize that:

H7: Crowdfunding projects with largest number of facebook shares are more likely to be successfully funded than projects with fewest shares.

Type of founder. In an efficient market success of a founder depends on the quality of the campaign. Founders with the highest quality projects should receive funding. However, the quality is only imperfectly observable. Funders, therefore, rely on quality signals. Funders may condition their actions on how much they “trust” a founder (Belleflamme et al, 2015). Duarte et al. (2012) concluding that trusting a borrower plays an essential role in a lender’s willingness to lend. We admit that the same thing can occur with crowdfunding. Possibly, the characteristics of the founder (eg. private vs institution), even if not directly related to the quality of the project, may affect the decision of the funders. So, the institutions those promote crowdfunding campaigns may seem more trustworthy in the eyes of the backers than the individual founders. We believe that Institutions are more likely to succeed in a crowdfunding campaign, thus we propose the following hypothesis:

H8: Crowdfunding projects in which founders are institutions are more likely to be successfully funded than projects promoted by private ones.

4. DATA AND MODEL DESCRIPTION

Data for the analysis is derived from the most popular crowdfunding platform in Portugal (PPL crowdfunding). The final dataset contains information on 347 PPL campaigns initiated and ended in 2017. Data were compiled from initial campaign descriptions and result appearing on the PPL platform after expiration of campaign deadline. In the 347 campaigns 52.2% obtained the intended financing while 47.8% did not reach the goal project.

Using a binary logistic regression model this paper investigates the factors driving a campaign’s success. The dependent binary variable (1/0) is represented by the campaign crowdfunding status (success/failure). The classification of „success“ was assigned in cases where the intended financing was obtained (or passed on). They were classified as "failure" if the intended funding was not achieved. The independent variables used in this study are a mix of continuous and categorical variables. The definitions of the individual level model variables are given in Table 1.

Table 1: Definitions of individual variables

Variables		Description	
Dependent variable	Crowdfunding Campaign Status	Whether or not the project succeeded in getting the funding	= 1 denoting intended financing was obtained (or passed on); 0= stands not obtaining the intended financing
Independent variables	Project Goal	The amount that the founders seek using crowdfunding	= amount of the intended financing (€)
	Duration	Funding duration	= Number of months
	Backers	Funders supporting the project	= Number of Backers
	Facebook Shares	Project Facebook shares	= Number of project shares made via Facebook (Log10)
	Geographic Distance	Project region	= 0 ex-Portuguese colonies; 1= Portugal
	Project Comments	Comments about project	= 0 not receive comments; 1= receive comments
	Communication Quality		= 0 communication with just videos or photos; 1= communication with videos and photos
	Founders	Type of founder	= 0 Private; 1= Institution



The binary logistic regression model to test our hypotheses related to the factors driving a campaign’s success given by:

$$\text{Ln} \frac{p}{1 - p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

Where p stands for the campaign’s success probability; β_0 is the intercept and β_i is the regression coefficient. In logistic regression the coefficients derived from the model (e.g., β_1) indicate the change in the expected log odds relative to a one unit change in X_1 , holding all other predictors constant. The beta coefficients are estimated through the method of maximum-likelihood method. Version 23.0 of the Statistical Package for the Social Sciences (SPSS) was used to analyze the logistic regression.

5. RESULTS

5.1. DESCRIPTIVE STATISTICS

Table 2 shows some of the characteristics of the sample. In the 347 crowdfunding campaigns in the sample, 89.6% were located in Portugal, while a little more than 10% were intended to be carried out in the ex-Portuguese colonies of Africa. The campaigns originated in private founders (45%) and in diverse institutions (55%). The initiatives of private founders had more cases of failure than success (48.7% versus 51.3%). In the Institutions the situation found is different: 55% of the initiatives were successful and 45% failed to obtain the target funding. In terms of communication it is noted that about 2/3 of the campaigns on the platform were supported in images and videos. The use of only one of these means of communication is minority in the sample (38.6%). Campaigns that only used photos or video recorded a higher failure rate (53%) compared to campaigns that used a strategy of communication with videos and photos together (44.6%). Campaigns that received comments during the active period were on average more successful (73.9%) while those that did not receive comments only 34.2% achieved the amount of funding goal (Chi2=54.228 p=.000).

Table 2: Descriptive statistics of categorical independent variables

Variable	Value	Successful	Unsuccessful	Total	
		Percentage	Percentage	Percentage	Frequency
Geographic distance	Ex- Portuguese colonies	61.1	38.9	10.4	36
	Portugal	51.1	48.9	89.6	311
		Chi2=1.289 p=.169		100.0	347
Project Comments	Without Comments	34.2	65.8	54.8	190
	Receive comments	73.9	26.1	45.2	157
		Chi2=54.228 p=.000		100.0	347
Communication Quality	Video(s) or foto(s)	47.0	53.0	38.6	134
	Video(s)+foto(s)	55.4	44.6	61.4	213
		Chi2=2.317 p=.079		100.0	347
Founders	Private	48.7	51.3	45.0	156
	Institution	55.0	45.0	55.0	191
		Chi2=1.347 p=.146		100.0	347

Table 3 shows several continuous independent variables that potentially differentiate the campaigns with the highest probability of success. This is notably the case with network shares where we see that the most shared campaigns on facebook achieved, on average, greater success than those that were less shared (Anova F 34.433; Anova p = 0.000). Reward-based crowdfunding campaigns successfully had a greater number of backers than those who were classified as "unsuccessful" (Anova F 81.164; Anova p = 0.000). Unsuccessful campaigns had a longer duration and larger project goals. The average duration of successful campaigns was 1.55 months versus 1.67 months of unsuccessful campaigns. The project goal average of the successful campaigns was € 2902.5 against € 4550.

Table 3: Descriptive statistics of continuous independent variables

Value	Total	Successful	Unsuccessful	Successful	Unsuccessful	Anova-F	Anova-p
	Means	Means	Means	Std dev.	Std dev.		
Project Goal (€)	3690.8	2902.5	4550.4	8287.9	11351.5	3.448	.064
Duration (months)	1.61	1.55	1.67	0.62	0.57	3.473	.063
Backers (number)	45.0	77.5	9.6	96.3	12.3	81.164	.000
Facebook Shares (Number Log)	1.87	2.19	1.52	1.071	1.067	34.433	.000

5.2. MULTIVARIATE ANALYSIS

We obtained the matrix of correlations between the independent variables used in the model. Although some of the correlations are significant they are not high enough (none is higher than 0.5), to conduct to multicollinearity problems (Hair et al., 1998; Sharma, 1996).

The logistic regression analysis proved to be a statistically significant model (difference test/chi square = 327.065, df = 8, p = 0.000). The result of the Hosmer-Lemeshow test (chi square = 9,160; df = 8; p = 0.329) confirmed that the model fits the data. The classification table indicates that the model correctly classifies 87.0% of cases. According to the Nagelkerke R Square, the dependent variable variance explained by the model is 81.4%.

Analysis of Table 4 enables identification of the significant Wald coefficients in four variables (p<0.05): Project Goal (H1), Duration (H3), Backers (H5) and Facebook Shares (H7). These four variables are able to predict the success of reward-based crowdfunding campaigns.

Geographic Distance (H2), Project Comments (H4), Communication Quality (H6) and Founders (H8) also used in the model, are not significant determinants of the probability of the success of crowdfunding campaigns at the usual statistical significance (p<0.05).

**Table 4: Determinants of campaign's success**

Variable	Coefficient (B)	Wald Chi-Square	Exp(B)	p-value
Intercept	-.221	.049	.802	.824
Project Goal (euros)	-.001	29.916	.163	.000 (*)
Geographic Distance (Portugal)	-.088	.015	.915	.903
Duration (months)	-1.816	11.638	.163	.001(*)
Project Comments (yes)	.868	3.533	2.383	.060
Backers (number)	.166	54.240	1.180	.000(*)
Communication Quality (video+photo)	-.297	.435	.743	.509
Facebook Shares (Log number)	.467	4.614	1.594	.032(**)
Founders (Institution)	.434	.938	1.543	.333

(*) (p<0.01) (**) (p<0.05)

6. CONCLUSIONS

Previous studies investigated the success determinants of rewards-based crowdfunding campaigns were conducted mostly in the US and based on the world's largest crowdfunding reward platforms such as Kickstarter or Indiegogo. Our study was carried out in the different context and we have added some new potential drivers that can influence the success of the crowdfunding campaign. Our study focused on less studied context and used new variables complementing existing research on crowdfunding projects' success determinants.

Before presenting conclusions related to the hypotheses tested, it is important emphasize the high level of success found in the sample. More than half the campaigns have achieved the goal project.

We found that project's target amount is negatively correlated with its success. This finding is in line with the results of previous studies referred in literature review section. Indeed, and regardless of the context, smaller crowdfunding projects are more likely to be well funded than larger projects, confirming our first hypothesis.

Our study also found that duration of crowdfunding campaign is negatively correlated with its success. The long durations of the campaigns can give greater visibility of the project, but do not lead a better performance, and perhaps these long campaigns can be seen as lack of confidence of the founders. Contrary to our expectation the "visibility" factor did not prevail, leading the conclusion that crowdfunding projects with a longer duration (i.e., open for more days) are less likely to be successfully funded than those with shorter duration. This result is contrary to predicted in our third hypothesis.

In hypothesis 5 we tested that crowdfunding projects that receive the support of a larger number of backers are more likely to be successfully funded than projects that receive support from fewer backers. Our hypothesis has been confirmed. The result obtained revealed that successful campaigns seem to attract more backers than campaigns that do not reach their target funding.

Our analysis also confirms that the number of Facebook shares correlates with the success of the project. This allows us to conclude that projects can be driven to success through social network. According results social networks can adequately complement the description of the campaign that a founder would give on a crowdfunding platform. As

predicted in hypothesis 7 we have confirmed that crowdfunding projects with largest number of Facebook shares are more likely to be successfully funded than projects with lowest number of shares.

The quality indicator of the communication of the projects used in study (video and photos) are not correlated with the success of the funding in PPL crowdfunding, contrary to what is found in other studies mentioned in the literature. Also the type of promoter (private or institution) that we admit can predict the success of the campaign has not occurred. This indicates that more than a communication strand or promoter type, funders are sensitive to other characteristics. These results lead to the rejection of hypotheses 6 and 8. Our results found no correlation between geographic distance and successful financing. The crowdfunding campaigns for Portuguese ex-colonies do not seem to exacerbate funders' doubts, perhaps because the nature of the campaigns leads them to rely on the development of projects. The second hypothesis predicting crowdfunding projects developed in Portugal are more likely to be successfully funded than projects located in ex- Portuguese colonies, it was not confirmed.

Finally, we also looked at the 'comments' on the success of the campaign. Comments received on the platform seem to have some significance in the success of the crowdfunding campaign. However, the level of significance obtained ($p=0.06$) is slightly lower than fixed statistical significance ($p<0.05$).

Taking together insights from the related literature and our findings, we put forward two conjectures: 1) Smaller and shorter duration crowdfunding projects are instrumental for crowdfunding success; 2) The importance of social networking for fundraising suggests that funders need to build their networks before committing to campaigns.

More research is surely needed to assess the determinants of successful campaigns. We present two suggestions: First, how do characteristics of the individual launching the crowdfunding campaign influence crowdfunding outcomes? Second, Entrepreneurs generally broadcast crowdfunding appeals to potential investors using an online narrative. These narratives use a variety of media to encourage investment. How the content presented and media used interact to influence crowdfunding outcomes?

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