Crowdfunding:
An Empirical and Theoretical Model of Non-Profit Support

Andrew Read

March, 2013

Senior thesis submitted in partial fulfillment
of the requirements for a
Bachelor of Arts (or Science) degree in Economics
at the University of Puget Sound
Crowdfunding: An Empirical and Theoretical Model of Non-Profit Support

Crowdsourcing, the umbrella term that includes crowdfunding, was introduced as a method of outsourcing new solutions for corporate improvement by accessing the ideas of the ‘crowd’. Crowdsourcing relies upon open innovation using the intelligence of the collective and was first defined as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use.”\(^1\) Similarly, crowdfunding uses the crowd, but focuses on the ability to use a large quantity of individuals to generate capital needed to fund a variety of projects/organizations/businesses. Since the innovation of general web-based crowdfunding began in 2008, crowdfunding platforms have expanded from the small-scale to truly massive enterprises that have seen incredible annual growth. This has paralleled the crowdfunding platforms shift from a niche idea to a mainstream funding solution.

Currently, the non-profit sector must allocate a significant portion of its available resources to fundraising initiatives to maintain operations. Substantial amounts of time and effort are required to secure grants, court donors, and execute fundraising events. Fundamentally, one of the greater challenges for non-profits remains reaching a wide audience with their message and targeting relevant donors likely to agree with their cause. The introduction of crowdfunding platforms in 2009 has produced new ways for non-profits to approach funding that will change this outcome. Non-profits can approach crowdfunding as a

\(^1\) Scott E. Hartley. *Crowd-Sourced Microfinance and Cooperation in Group Lending*. 3.
new means to find funding from the crowd in an environment that facilitates large amounts of small giving. Crowdfunding is allowing non-profits to diversify their funding while also appealing to a multitude of possible donors, enhancing their funding potential.

However, despite all the hype surrounding this new means of fundraising, crowdfunding is not a cure-all funding solution when used as a funding tool. There are still growing doubts about the inability to effectively ensure quality control, enforce project deadlines, and operate transparently on crowdfunding platforms. These concerns have acted to dissuade many from utilizing and contributing through crowdfunding platforms. However, recent research put forward (Schweinbacher et al. 2010) suggests that non-profit status on individual projects provides a much higher success rate and overall funding amount than its for-profit counterparts on similar crowdfunding platforms. Individual projects convey that they do not have for-profit motives by signaling non-profit status and thereby establishing both trustworthiness and confidence in a project’s relative quality with platform contributors. Building on Schweinbacher’s research, this current study on crowdfunding platforms explains the theory behind the individual project factors that make non-profits more successful than their counterparts and uses an empirical evaluation of these factors to validate their effects.

II. Current Literature

Predictably, there is very little literature on crowdfunding, and, given the recent nature of its development, little has been written on non-profit involvement in crowdfunding.
platforms. In an earlier study by Wojchiechowski (2009), new methods for acquiring donations were advanced by tapping the popularity of social media. The author suggests that web-based services present a growing opportunity to identify groups of people who share in the company’s or organization’s mission or beliefs. Thereby using social media, non-profits are able to reach out to a greater audience and secure a larger base from which to draw donations.

Crowdfunding initiatives operate under similar conditions that Wojchiechowski identified as potentially conducive to a non-profit organization’s donative appeal. Gerber (2010) discusses the importance of non-profits in the emerging crowdfunding industry and concludes that the emphasis on being in a donative community is one of the major motivators for crowdfunding participation. Specifically, crowdfunding supporters of non-profits are encouraged by “sympathy and empathy towards the cause, feeling guilty for not giving, and strengthening identity and social status.” Crowdfunding participation offers the ability to browse for a cause that suits individual interests and provides altruistic fulfillment. Moreover, Gerber concludes firms can reduce time and transactions costs by becoming involved in crowdfunding. Under the umbrella of ‘web 2.0’, or the modern internet interaction, crowdfunding offers a safe and convenient way to foster ideas and is significantly easier for financial transactions via online payment methods. Similarly, Bons (2008) describes the benefits of the internet as a medium for exchange in Open Innovation: The Benefits of Crowdsourcing. The internet has tremendous value as a means of connecting with clientele and is both safe and easy to use. Her emphasis focuses on the reasons for how ideas are fostered on the medium

2 Metzler, Tobias. Venture Financing by Crowd Funding. (Norderstet: Bonn Publishing. 2011), 16
and how feedback within crowdfunding platforms can spark innovation. One of the values in crowdfunding is the ability to express views on the project that are visible on the crowdfunding site for both the creator and supporters.

The first empirical study on the crowdfunding industry by Schweinbacher et al. (2010) cemented the value of non-profit crowdfunding with the study’s conclusion that non-profit projects generally secure more funding than general for-profit projects. The study controls for individual project characteristics and concludes non-profit status by itself can induce greater participation. These characteristics range from the category of individual projects (e.g. art, film, product, education, etc.) to the investment form for the project returns (e.g. active investment, passive investment, or donation), as well as a few others. The empirical analysis pinpoints certain drivers of project success of crowdfunding platforms as it relates to what type of project or project’s industry characteristics produce the greatest benefits. The study finds that types of investment produce very little effect on incentives to participate and support a project. In most cases, people are more concerned with funding an idea with which they agree rather than receiving a return on their investment. This suggests that people view general crowdfunding as a donation based enterprise and might explain why non-profits do significantly better. The conclusion assesses that non-profits generally do better than other alternatives, yet the conclusion could be pushed farther in terms of why non-profits stand to do better on crowdfunding platforms. The emphasis of this study is to pick up where Schweinbacher’s study left off and determine non-profit donative components.
III. Theory

Crowdfunding represents the drivers of individual non-profit project success in line with general scholarship on the foundations of non-profit donative giving. Non-profits have long exemplified the notion that signaling their status makes it significantly easier to generate capital because their emphasis isn’t on the desire for profits. This important characteristic, as the Hansmann (1980) study concludes, is a general indicator of quality and is a form of contract failure. Consumers are unable to achieve perfect information in most markets and must make do with how they perceive certain companies and organizations. Predictably, companies that are profit-oriented tend to put disproportionate effort into achieving profits at the expense of the quality that consumers expect. Consumers will respond by attaching meaning to non-profit status and are more willing to fund projects that display this.

The corollary to signaling theory is the general donative theory that necessitates the motivations for why people give. The driving force behind non-profit giving on crowdfunding platforms can be explained both by non-profit signaling and the extra motivations that accompany a donation. Konow (2006) offers a theoretical understanding of donative giving that fits well here. The author determines that a combination of altruism and the “warm glow” of giving are responsible for donations. People will gain utility through the betterment of the recipient of the donation and this is the basis of altruism. This is expressed as a relationship between two individuals through the donor and the recipient. This relationship is stated as a combination of the utility the donor maintains from the portion of potential funds not given to the recipient, \((X)\), as well as a function of the endowment the recipient had prior to the
donation \( e \) and the amount the recipient gains \( x \). The “warm glow” argument further states that a donor might donate simply because the act of giving makes the person feel better and is simply a function of giving \( g(x) \). This could mean a person feels an inflated self-worth or a variety of other intangible benefits from the donation. Sometimes called impure altruism, the “warm glow” is noted as a boost in a person’s sense of selflessness or social responsibility, simply in the act of giving. Altruism and the “warm glow” effect combine to form the following:

\[ U = U(X) + f(e+x) + g(x) \]

Crowdfunding platforms utilize both the altruist motive and the “warm glow” motive when it comes to non-profit donations. People find that non-profit signaling produces trust that allows them to increase their utility for both the altruistic motive and the “warm glow” motive. The altruist will feel comfortable in the fact that the money was probably used wisely because of the lack of the for-profit motive. This means there is a greater chance the donor’s money produced a positive benefit that makes the donor feel better. Secondly, the donor is more likely to feel the “warm glow” effect because they have donated within a crowdfunding community and can take part in the act of donating online.

Given this theoretical basis, crowdfunding platforms potentially add an interesting element to the equation. Schweinbacher concludes that types of investment do not matter which led to the conclusion that crowdfunding supporters do not identify returns on their investment as the greatest motivator of participation. However, rewards do matter, as the empirical evidence will show. Many crowdfunding platforms instruct prospective projects to issue a reward for any form of funding. While a for-profit firm usually uses the reward as a
return for pledging funds and is mainly the funded final product, non-profit rewards usually comprise an organizational keepsake such as a note or video illustrating where donor funds went. The idea is certainly not new and certain non-profits have provided these returns to donors in the past. The token usually describes how the donation was used or simply thanks the donor. The design is to reinforce the altruist motive by describing exactly where the funds were used. Crowdfunding rewards work in a similar manner, yet the reward system is built into the major crowdfunding platforms. Almost every project uses rewards and the generally physical nature of the return is notable. For example, t-shirts, a common reward, are seen as a reward that can be worn to display the donor’s involvement in crowdfunding and act to enhance the donor’s social benefits. The non-profit rewards allow crowdfunding donors to feel involved in the process and become part of a community. Therefore, to the function of altruism and the “warm glow” will be added the rewards that a donor can expect to receive \(c(\text{rew})\).

Added to the equation this is represented further:

\[
U=U(X)+f(e+x)+g(x)+c(\text{rew})
\]

This provides another theoretical basis for why crowdfunding sites are increasingly popular and why non-profits should shift part of their funding efforts to crowdfunding platforms. The inclusion of a reward for donors acts as a small additional incentive and can convince participation in the platform.

Another interesting phenomenon that affects involvement on crowdfunding platforms is the use of social screening of projects to establish a type of quality control. Non-profits’ use of crowdfunding platforms affords supporters the assurance of a quality project through the use
of the “hive-mind”, as well as the interaction of the crowd. Crowdfunding sites operate differently from normal donor channels as trending projects appear more commonly to users on the web platform. Crowdfunding platforms usually suggest projects that have already generated a large amount of attention and this seems to be a method of project endorsement. Projects that have already drawn a large number of supporters generally have significant quality or a unique idea to generate such funds. Moreover, the trending mechanism on most major sites operates by identifying the number of backers as opposed to the amount the project has already raised. This acts to sponsor projects that have attained a great deal of enthusiasm and not projects overinflated by a couple large donors. Theoretically, the hive-mind of the crowd should then be responsible for certain increases above and beyond the general merits of the individual project.

V. Data and Methodology

The attempt of this empirical model will be to extract which variables can explain the funding patterns on crowdfunding platforms. In order to provide an analysis of Crowdfunding platforms, two data sets with over 14,000 observations were used to construct a plausible model. Surveys were sent out to a number of crowdfunding platforms and two of the largest platforms have provided extensive metrics on individual projects. Kickstarter, the most popular crowdfunding site, has provided 14,000 projects that contain data on a variety of interesting variables. Likewise, the platform Fundrazr has released a data set that should be useful. Fundrazr is notable especially because it deals with relatively heavy traffic from non-profit
projects. The combination of the two data sets is useful to determine the effects of the variables in a regression equation for both the non-profit and for-profit sectors and should give balanced estimates.

The sample used in the regression needed to be sorted for non-profit status from the large list of observations. Once this was completed, a random number generator was used to pick certain observations that would be included in the sample. To produce the regression output, projects were combined with 108 observations from for-profit projects and 108 observations from non-profits. The data was taken from a cross-section between the periods of March 2011 to March 2012 and had all concluded their maximum funding period. This means that funding had stopped for all observations and had equal periods to attain their funds.

IV. Model

The empirical model seeks to explain what causes increases in the dependent variable for total funds raised per project by individual project characteristics. The variables were put into the ordinary least squares model to determine their validity and ability to explain changes in the function. The variables that are expected to make a noticeable impact on the overall funding of a project are the following: the age of the creator group backing the launch of the project, whether the project is a startup that is using crowdfunding to generate initial funds, whether it was a non-profit organization, the number of project backers, and whether a reward was offered. The definition of relevant variables can be found in the appendix in Table
1. The general equation using these variables to determine the regression statistics were as follows:

\[ \text{RAISED} = f(\text{AGE}, \text{START}, \text{NON}, \text{BACKERS}, \text{REW}) \]

The variables used in this equation are hypothesized to explain the majority of the total funds raised in a given project. Three separate models were tested with a variety of the variables as shown in Table 4, but the current variables seem to provide the best overall modifiers of crowdfunding success.

The dummy variable START determines if the company or idea is completely new and has yet to become established. Table 4 indicates a negative correlation with funds raised, which is in line with the theory that new firms will tend to send unfavorable signals. Many startup projects commonly display their startup status on their crowdfunding description, which would act as a signal that should be detrimental to their ability to raise funds. The variable AGE was included as well, despite being multicollinear with START. Projects that have a positive value for AGE are not going to be start-ups, so the value will be skewed. The decision was made to leave AGE in the equation due to the perceived theoretical value of the positive indication that greater amounts of organizational experience signals to crowdfunding supporters.

The variable REW is a dummy variable that specifies if the project offers a reward or if no reward is offered. This variable is usually contingent on which crowdfunding site it was placed upon, as rewards are generally encouraged for acceptance on some sites while not offered on others. This produced a noticeable early challenge, considering that rewards are generally tied to a crowdfunding platform’s rewards policy. This translated to the regression as
differences in reward choices became multicollinear, as they are correlated to the
crowdfunding platform and not the reward choice. However, it seems the results were not
significantly affected when the data sets for Kickstarter, Fundrazr, and Razoo were compared
against each other, so multicollinearity was allowed within the regression. The variable REW
positively correlated to an increase in funds raised with ten percent significance. People should
be more eager to fund a project that offers a reward as a form of partial compensation for
giving up part of their endowment.

The variable NON is a dummy variable that indicates whether the project is a non-profit
or for-profit. This variable should theoretically be especially significant toward project success
rate and is expected to carry a positive coefficient. The presence of non-profit status in the
project description acts as a signal to supporters of the trustworthiness of the project creator.
This is consistent with the theory of contract failure and why consumers would support a non-
profit over a for-profit. The expectation is that non-profit crowdfunding projects will tend to
attract a larger percentage of funding and have a higher success rate because of this. After
consulting Table 3, it was noted that there is a significant correlation between non-profit status
and the age of the organization and start-up status. Almost no start-up non-profits had success
utilizing crowdfunding and the sector was instead dominated by larger and more established
organizations. It appears that start-up non-profits do significantly worse than start-up for-profit
firms. One possible explanation is the distinctive nature of many of the for-profit start-ups
while non-profits are perhaps too generic to catch the attention of crowdfunders. In a number
of cases, donors could simply seek out an older and more established non-profit and direct
their funds to a similar cause that they see as signaling better usefulness due simply to
organizational experience. The variable NON was confirmed in Table 4 as the most significant estimator of project funds raised.

The final two variables will seek to explain the changes in the funds raised by individual projects for every unit increase in the other variables, all things held constant. The variable BACKER represents the number of people who contributed. Some projects are able to hit their target easily and attain success, but this can happen with a few donors who take on the project personally. The attempt to measure the signaling that a large number of backers imparts on the desirability to donate to a project was measured in the regression. The expected sign of BACKERS should thus be positively related to the success of the project. Table 4 concludes that the number of backers was significant in explaining increases in the funds raised. The nature of crowdfunding encourages many smaller donations and it appears that supporters are more willing to donate when it has been accepted by other peers on the platform.

The model has a number of variables that were considered but ultimately dropped from the regression equation. One of the reasons to drop some of the variables considered was the potential overlap and multicollinearity numerous variables might involve. Larger numbers of variables were less effective in explaining individual changes due to multicollinearity and thus inflated the R squared disproportionately. The variables were thereafter slimmed down to the current number, attaining an R squared of 41%.

Indicated in Table 1, the variables that were considered were ultimately dropped due to poor fits in the equation. One notable variable considered was LNPER that sought to explain the percentage of success, defined as the percentage of funds raised against their funding goal for a
given project. One of the quirks of many larger crowdfunding platforms is the reliance on “all or none” funding, meaning that a project is required to meet their funding goal to receive any of the pledged funds. This is designed to create product control for the sites, as significant support will be needed, and thereby acts to require for-profit projects to return on their promises. Therefore, the expected sign on LNPER should be positive as a variable beneficial to supporter confidence and is defined as the unit increases in project funds raised for every percentage increase in the success of the project, all else held constant. However, although the variable was useful for explaining the “all or none” funding platform successes, it was of little use for the other platforms and individual regressions showed it would skew the results and disproportionately modify existing variables. LNPER was subsequently dropped from the equation.

The second notable specification dropped from the equation is the variable UPD, which relates to the amount of project interface updates that the creator had produced. Increased updates should signal that the creator is invested in interacting with the supporter base to produce a better product and/or take suggestions from the user base. This variable seems consistent with general signaling theory whereby a project that indicates more updates or was more in touch with its supporter base should indicate better quality. This, in theory, should produce better results in attracting donors to the cause. In the final regression, the variable was dropped due to the high correlation with the amount of backers. Crowdfunding utilizes the ability to interact with backers, so as the amount of backers increases, the project will usually add updates to tailor the project to the input of the backers. Therefore, it seems that this
variable, while theoretically effective, would be captured in the regression by BACKERS itself, so UPD was ultimately dropped.

VI. Analysis

The regression equation does a relatively good job of describing the factors that influence the amount of funding raised per project and the major implication is that the variables were generally statistically significant from zero and could satisfactorily explain the changes in project funding.

The value for REW seen in Table 4 belies the value of the offer to crowdfunding projects. People are motivated to participate when they have something to gain from the exchange and it gives them a sense of involvement in the process of development. Even in the situations where donations are considered, the rewards system seems valuable, as it inspires connection to the outcome amongst the supporters. Regressions run between Kickstarter, Fundrazr, and Razoo and their disparate rewards systems allowed the conclusion that rewards offers are almost universal project funding boosters.

Likewise, the statistical significance of the variable BACKERS belies the importance of the hive-mind and creator interaction for project funding. It is likely that interaction with supporters provides substantial signals that the project is well-planned and generally well-maintained. Crowdfunding users will be more likely to become project supporters when they have the reassurance that their funds will be used in an efficient manner that draws from their
desire for altruism. If their funds are used well, as increased planning and project maintenance would indicate, then their utility gained from altruism would be expected to increase accordingly.

The model did encounter a number of challenges that needed to be corrected before a final equation was reached. As occurs on many cross-sectional data sets, the presence of heteroskedasticity was a problem. In order to correct for this problem, the regression was run with White-test heteroskedasticity corrected standard errors to bring the data in line. The correction resulted in the reduction in the significance of a number of variables. However, the model seems well-suited to determinants of crowdfunding success and can be used with confidence.

VII. Conclusions

This study conducts one of the first known studies on the crowdfunding industry and the first known study specifically on non-profits’ role within them. As such, there are numerous policy implications that might exist given the regression explanations. Firstly, crowdfunding generally seems to be a benefit to projects and has many advantages that can be explained both theoretically and empirically. The policy recommendations to various projects on crowdfunding platforms are numerous. One of the most important policy implications from the regression is that non-profit status does matter in the presentation to supporters. The success of projects seems to be heavily related to the signals it sends out. The results of the regression
support the supposition that non-profits can take advantage of the process of market failure and the other motives for donating effectively on crowdfunding platforms.

One of the major challenges to the crowdfunding industry is supporter protection and quality control. There is simply little in the way of a project creator taking all the raised revenue and not producing a satisfactory final product. Crowdfunding supporters are in essence investors on for-profit projects and might see no return and have to endure high risks given that project quality is hard to measure as a crowdfunding supporter. It seems that non-profits can use a variety of signals to induce higher potential funding for their projects. Crowdfunding project creators can use a variety of means to signal to supporters that their crowdfunding product is superior.

Simply displaying non-profit status somewhere in the title or description is the foremost and easiest means for a non-profit to signal project quality. Notably, the non-profit status has to be easily visible, as most supporters spend a relatively small amount of time browsing projects. Secondly, creating physical rewards can produce greater benefits to crowdfunding projects than those that choose non-physical options, such as a “thank you” e-mail. Rewards are not viewed as returns on investment for non-profits as they usually are for for-profit projects and instead are used as a signal of trustworthiness. Supporters use crowdfunding in part for the feelings of social benefit the act of donating imparts and many would like to know that the money was well-used. Non-profits could do better by using physical rewards to express how the funds were allocated. Future empirical studies might be necessary to determine which types of rewards could most effectively reward project donors. Finally, non-profits can expect
to do substantially better when the project has been picked up by a critical mass of supporters. Non-profits that attract support by using the functions available on crowdfunding platforms like the social media function can attract significantly more support. The trending nature of projects that achieve many backers and not necessarily large amounts of capital can boost their funding potential.

Non-profits that seek to use crowdfunding platforms can use these signals for their benefit and generate substantially more funding than they otherwise would. Crowdfunding looks like a promising avenue for non-profit donor strategy given the positive effects that signaling on the platforms can induce. Ultimately, it seems crowdfunding is primed as a unique means of attracting additional funding for non-profits and signaling is one of the key factors that can make crowdfunding a success.
Cited Works


Scott E. Hartley. *Crowd-Sourced Microfinance and Cooperation in Group Lending*.


2011-2012 Crowdfunding raw Survey Data.


Table 1-Variables

Final Variables

RAISED = Total funds raised per project in US dollars

BACKER = The number of supporters who give to a project in its funding period

START = A dummy variable that will be 1 if the company or organization is a startup and 0 if it is established

REW = A dummy variable that will be 1 if the company or organization offers a reward to project supporters and 0 if it does not

NON = A dummy variable that will be 1 if the project held non-profit status and 0 if it does not

AGE = The age of the organization of group receiving crowdfunding funds

Considered Variables

ORG = A dummy variable that will be 1 if the project is created by an established organization and 0 if it is not established

OUT = A dummy variable that will be one if the project produces a product as its return and 0 if it does not

DON = A dummy variable that will be 1 if the project strictly accepts donations and 0 if it does not

AON = A dummy variable that will be 1 if the crowdfunding platform uses all or nothing funding and 0 if it does not. Some crowdfunding platforms return funds to supporters if the project target is not met
TARGET = The target amount of the project
UPD = The number of project updates
RAISED/BACKER = The average amount of project funding per project supporter
LNPER = Project success rate as percentage written as a logarithm

Table 2-Summary Statistics

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<th>Standard Deviation</th>
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Table 3-Correlation Matrix

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<th>NON</th>
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<th>REW</th>
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Note: Correlation significance is denoted by (*) for 10% significance, (**) for 5% significance, and (***) for 1% significance.
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<td>(102.61)</td>
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