

# **Reward-based crowdfunding campaigns: informational value and access to venture capital**

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## **Abstract (Reward-based crowdfunding campaigns)**

We consider an entrepreneur who designs a reward-based crowdfunding campaign when the campaign provides a signal about future demand and subsequent venture capital is needed. We find that both the informativeness of the campaign and gaining access to venture capital affect the entrepreneur's decisions. In particular, entrepreneurs should launch the campaign either when it is highly informative or when it is uninformative at all. For relatively low levels of informativeness, the entrepreneur might forgo the opportunity of acquiring information via crowdfunding. We also find that the preference of entrepreneurs in favour of crowdfunding is stronger than that of VCs.

**Keywords:** reward-based crowdfunding, information acquisition, venture capital

## **Introduction**

Crowdfunding is a novel method for raising capital to finance new projects, allowing founders of entrepreneurial, cultural, or social projects to solicit funding from many individuals, i.e., the crowd, in return for future rewards or equity (Mollick, 2014). In reward-based crowdfunding, in exchange for funding, the entrepreneur promises the funder a reward, which often takes the form of the completed product if it is successfully produced. In contrast, in equity-based crowdfunding, funding is provided in exchange for an equity stake in the start-up (Belleflamme et al., 2014). Crowdfunding has rapidly gained in popularity, with \$34.4 billion raised across the globe in 2015 and expected to top \$60 billion in 2016. Kickstarter, a leading platform for reward-based crowdfunding

worldwide, has launched more than 364,000 crowdfunding campaigns, with 36% successfully funded by more than 13 million individuals.

In recent years, there has been a trend of using reward-based crowdfunding for developing consumer technology products. On Kickstarter, games, technology and product design are the top three categories in terms of total dollars raised. These projects typically require large amount of capital to support development and large-scale manufacturing and/or commercialization. Given that the amount of capital raised in a typical reward-based crowdfunding campaign is below \$1 million, marketing of new consumer products in these categories necessitates subsequent rounds of funding from professional investors, e.g., Venture Capitalists (VCs). However, a successful campaign does not guarantee the support of VCs. According to CB Insights, only 9.5% of crowdfunded hardware campaigns receiving at least \$100,000 campaign funds have secured subsequent funding from VCs. Thus, apart from the inherent uncertainty in new product development, the prospect of lack of VC funding in spite of a successful campaign makes technology related projects highly risky. In fact, campaigns of technology projects have the lowest success rate of 19.83% on Kickstarter, compared to dancing or theatre projects that enjoy success rates of more than 60%.

Consumers who pledge in reward-based crowdfunding campaigns, whom we refer to as backers, are typically interested in experimenting with early prototypes and in gaining early access to new products. Because backers put down money for a product that has yet to be produced, and because they tend to be drawn from the population of potential consumers, the number of backers and the overall capital raised in the campaign may serve as an early indication of the enthusiasm for the product (Agrawal et al., 2014). This view has been expressed, indeed, by serial entrepreneur Phil Windley who stated “The primary reason I like the idea of Kickstarter is that it validates an idea ... The money we’ll make is likely small potatoes compared to what we’d raise in a typical funding scenario ... But the big payoff is the information about the potential market” (Conner, 2013). The community of professional investors shares similar views (Cao, 2014). In fact, due to the high risk of backing start-ups, VCs many times do not invest until a company has validated the market, gained traction, and demonstrated it can execute the project. In this regard, equity-based crowdfunding might be of limited value because the complex legal issues involved tend to attract professional and accredited investors such as angel investors or VCs whose behaviour is unlikely to be representative of general consumers.

While reward-based crowdfunding may provide information on the market potential of the product, running it carries some risk to entrepreneurs. As suggested by industry practice, VCs typically interpret a failed campaign as a grim signal of the potential success of the product and the managerial capabilities of the entrepreneur. As a result, it becomes harder for the entrepreneur to access VC funding after a failed campaign (Strohmeier, 2013; Houssou and Belvisi, 2014). This provides the entrepreneur an incentive to set the campaign goal at a low level, because a campaign is deemed successful only when the amount raised in the campaign exceeds this goal. However, because VCs typically run their own market research before making funding decisions, choosing a low goal increases the likelihood that the campaign is successful but the project is not subsequently funded by the VC. In this case, the entrepreneur may have already spent part or all of the campaign funds in early activities of new product development, such as applying for patents. Due to insufficient funding, the entrepreneur will have no choice but to terminate the project, in which case each backer may receive

a partial refund, an underdeveloped product, or nothing at all. Thus, a lower goal increases the risk backers face of losing their pledge and receiving little in return, which may discourage them from pledging. This dilemma facing the entrepreneur showcases the interesting research questions that can arise in an environment where crowdfunding campaigns serve as a source of information about future demand and where VC funding is essential for developing and commercializing the full product. Specifically, how should the entrepreneur choose the campaign goal and the pledge level that entitles backers to receive the product if it becomes available? Does the entrepreneur always prefer to run a crowdfunding campaign prior to approaching VC for funding? What is the VC's preference regarding the entrepreneur's choice of running a campaign?

## **Literature review**

The nascent literature on crowdfunding has investigated the problem mostly from an empirical perspective (e.g., Ordanini et al., 2011; Agrawal et al., 2014; Mollick, 2013, 2014; Ahlers et al., 2015; Colombo et al., 2015; Mollick and Nanda, 2016; Burtch et al., 2013, 2015; Roma et al., 2017). Few papers have studied crowdfunding from a theoretical perspective (Belleflamme et al., 2014; Hu et al., 2015; Bender et al., 2015). We contribute to this literature by examining the design of a reward-based crowdfunding campaign when the campaign generates demand information and subsequent VC funding is essential for developing the full product and commercializing it to the mass market.

Our study is also related to the literature on crowd involvement in the innovation process, including Internet-enabled financing, crowd sourcing, problem solving, and consumer voting (e.g., Terwiesch and Xu, 2008; Boudreau et al., 2011; Marinesi and Girotra, 2013; Bayus, 2013; Huang et al., 2014; Chen et al., 2015; Liu et al., 2015; Araman and Caldentey, 2016). Similar to consumer voting systems, reward-based crowdfunding can be used as a participative mechanism that enables firms to gather information about consumers' preferences. Different from the literature above, the issue of raising capital is central to crowdfunding and the entrepreneur has already a well-formulated idea for a new product. As a result, consumers commit with their money rather than simply voting for an innovation. These differences have important implications in terms of findings. Indeed, in crowd-voting platforms, entrepreneurs who need to make product development decisions always benefit from information obtained via consumer votes. In contrast, we show that considering the dual role of crowdfunding may lead the entrepreneur to consciously forgo the option of obtaining demand signal via the campaign in order to improve the odds of obtaining funding from the VC.

## **Model**

In this paper, we develop a three-stage game to address the research questions. In the first stage, the entrepreneur sets the goal and the pledge level. These two instruments determine the target number, i.e., the minimum number of backers required for the campaign to be successful. Once the entrepreneur runs the campaign, the number of backers and the total amount of pledges realize. Following the rule of Kickstarter, if total pledges fall short of the declared goal, the campaign is considered a failure and the entrepreneur does not receive any of the backers' funds. The entrepreneur may still approach the VC upon campaign failure, but consistent with industry practice, the likelihood that the VC considers the possibility of funding in this case is quite small. If total pledges exceed the declared goal, the campaign is successful and the entrepreneur

receives the funds raised in the campaign. The entrepreneur then uses the funds to develop further the product, while approaching the VC for additional funding. If the VC agrees to consider the possibility of funding, the game proceeds to the second stage where he conducts an independent market research to evaluate the prospects of the project. The VC then uses the outcome of this market research combined with the observation of the campaign to decide on whether to fund the project. If the VC declines to fund, the entrepreneur terminates the project and, in case of campaign success, sends each backer an underdeveloped product or partial refund. If the VC decides in favour of funding, the game proceeds to the third stage when both parties negotiate on how to split the future profit if the product is successfully commercialized to the mass market. As we only consider reward-based crowdfunding, the term "reward-based" is omitted in the rest of the paper.

## **Results**

Our study illustrates that both the extent of informativeness of the campaign and considerations related to gaining access to VC funding play important roles in setting the campaign instruments. When the campaign is not informative of future demand so that the VC ignores it in his funding decision, the target number and the goal should be set at a low level to ensure campaign success. When the campaign becomes more informative, the entrepreneur chooses to raise the target number and the goal because a more demanding goal, once reached, demonstrates better prospects for the product, thus supporting higher pledge levels. However, when the level of campaign informativeness is very high, the VC's decision relies mostly on the campaign outcome, so backers are less concerned about lack of VC funding following a successful campaign and the entrepreneur might choose to lower the target number and the goal in order to improve the odds of campaign success.

We identify three potential benefits that crowdfunding offers the entrepreneur to offset against her risk of campaign failure. In addition to serving as a source of information regarding future demand, crowdfunding can be used as a vehicle to practice price discrimination between backers and consumers. In addition, the entrepreneur benefits from receiving the entire contributions from backers without sharing them with the VC when the campaign is successful. In the absence of crowdfunding, she receives only a portion of the expected profits from selling the product to backers in the future market. When the campaign and the VC's market research produce independent signals of future demand, we show that for relatively small projects, running a campaign before approaching the VC is definitely the right choice for the entrepreneur. In contrast, for projects that require large development costs the entrepreneur's preference in favour of running a campaign depends on the relative informativeness of the campaign in comparison to the VC's market research. Surprisingly, the entrepreneur prefers to run the campaign not only when the extent of campaign informativeness is high, but also when it is very low. In the latter case, the strict preference originates exclusively from benefits unrelated to the informativeness of the campaign. For relatively low informativeness, but not so low that the VC ignores the number of backers in his funding decision, the entrepreneur might forgo the opportunity of acquiring information via crowdfunding because the benefits of crowdfunding are insufficient to offset the risk of campaign failure. These results remain qualitatively the same when the campaign signal is (positively) correlated with the VC's market research outcome, although correlation diminishes the informational value of crowdfunding. Because the only benefit from

crowdfunding that accrues to the VC relates to the informativeness of the campaign, we also find that the VC prefers crowdfunding over a smaller region of parameter values than the entrepreneur does.

Our findings are consistent with observations in the industry. Crowdfunding appears to provide valuable information for consumer hardware products, which are relatively easy to evaluate and tend to attract backers who are representative of the future market. For example, after succeeding on Kickstarter or Indiegogo, consumer hardware start-ups such as Scanadu, Formlabs, Lifix, Romotive, and Canary received VC funding for product development. In contrast, reward-based crowdfunding does not seem to be particularly informative for chemical products or consumer medical devices, which require special skills in assessing their value or are unlikely to attract individuals in their target market to pledge. This unfortunately has been the case for BeActive Brace, a new pressure brace for back-pain that its inventor tried to promote through crowdfunding without success. Later he “ditched” crowdfunding after realizing that “his true target audience was not among the backers who frequent Kickstarter or Indiegogo”. For products that are unlikely to yield valuable information via crowdfunding campaigns, our results indicate that entrepreneurs might either approach VCs directly without running a campaign, or if running a campaign, set a low goal to ensure campaign success.

## **Conclusion**

Running a reward-based crowdfunding campaign may be extremely valuable, especially for projects that aim at developing new technology-based consumer products, which typically face high market uncertainty and require supplemental capital from professional investors. Indeed, crowdfunding can provide information about the market potential of the product and thus, in case of positive signals from the campaign, convince sceptical VCs to invest in the project. However, campaign failure may adversely affect the entrepreneur's access to VC capital. Our study provides a number of insights for crowdfunding projects requiring subsequent funding from VCs. For backers, we point out that in addition to the inherent risk in new product development they should be cognizant of the risk that successful campaigns do not guarantee subsequent VC funding, in which case they lose some of their contribution. For VCs, we suggest that in making their funding decision they should first assess whether the outcome of the campaign is helpful in predicting the future success of the product. The considerations of the VC and the backers should guide the entrepreneur in choosing her campaign instruments.

This is the first paper that examines the dual role of reward-based crowdfunding as a source of information about future demand as well as a mechanism for raising funds by early-stage start-ups. Our study illustrates how considerations related to gaining access to venture capital and to acquiring demand information affect the entrepreneur's decision regarding the design of the campaign and the decision on whether to utilize this mechanism at all. We also contribute to the general literature on platforms and information systems, by exploring the behaviour of three types of platform users: backers who pledge funds, entrepreneurs who design the campaign and venture capitalists who use the campaign outcome to make investment decisions. As the use of crowdfunding becomes more prevalent for entrepreneurial projects, our study offers a deeper understanding on the dual role of reward-based crowdfunding.

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