Research Report

Internalizing the Externalities of Overfunding on Crowdfunding Platforms

CROWDFUNDING PLATFORMS HAVE BECOME A VALUABLE ALTERNATIVE TO TRADITIONAL SOURCES OF FINANCING. HOWEVER, SOME PHENOMENA ON CROWDFUNDING PLATFORMS CAUSE UNDESIRABLE EXTERNAL EFFECTS THAT CAN ADVERSELY INFLUENCE THE FUNDING SUCCESS OF PROJECTS. ONE SUCH PHENOMENON IS PROJECT OVERFUNDING. IN ORDER TO INTERNALIZE THE EXTERNALITIES OF OVERFUNDING, WE PROPOSE A FUNDING REDISTRIBUTION APPROACH FOR IMPROVING OVERALL FUNDING RESULTS. TO EVALUATE THIS CONCEPT, WE DEVELOP AND DEPLOY AN AGENT-BASED MODEL.

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Introduction

Asking a large crowd of people to support an initiative is not a new concept but the far-reaching connectivity of the Internet has turned this concept into a serious alternative to traditional ways of financing. The fast and dynamic ascent of crowd-based approaches to acquire capital, like crowdfunding, crowdinvesting, or P2P lending, has attracted attention not only of capital-seeking individuals but also of academic research. However, literature discussing the question of how crowdfunding can serve best all of its stakeholders or of how to deal with possible negative externalities is quite scarce. A relevant example for negative externalities on crowdfunding platforms is project overfunding. In the case of overfunding, a crowdfunding project collects much more funding compared to the actual funding goal, which is a consequence of individuals' funding behavior. In this context, it has been discussed that overfunding can cause negative externalities for other valuable projects which are overshadowed by over funded blockbuster projects and, thus, suffer the disadvantage of collecting not enough money for reaching their funding goal (Kim et al., 2016; Liu et al., 2015). In order to internalize these externalities, we follow economic theory and propose a funding redistribution mechanism for crowdfunding platforms. Specifically, we address the research question of whether a taxation mechanism is able to improve overall funding results. On that account, we propose the introduction of an on-platform "taxation" mechanism that allows for redistributing funds to valuable underfunded projects improving overall funding outcomes. Since no data is available for evaluating the effect of our taxation approach and real tests would be costly for platforms, we propose an agent-based model (ABM). The ABM simulates a real platform system for analyzing the behavior of different agents.

Simulation: Applying a "Tax" to Overfunding

We apply a simulation to analyze the consequences of introducing a tax on overfunding. Therefore, we follow the four steps proposed by Gupta and Prakash (1993) for the process of internalizing externalities: (i) the (negative) externalities need to be recognized, (ii) the perpetrator and the potential victim must be identified, (iii) for each party, costs and benefits of internalization need to be evaluated, and (iv) the costs and benefits of internalization need to be assigned. For the assignment of costs and benefits, the policy maker needs to decide which mechanism to use.

Regarding these four steps, we argue the following: (i) Research has already recognized negative externalities resulting from overfunded projects on crowdfunding platforms (Kim et al., 2016; Liu et al., 2015). (ii) However, not the projects or initiators are the perpetrators that cause the negative externalities but the funders who are the active deciders and choose to concentrate on blockbuster projects. By this focus, some projects become more visible and overshadow other projects. The victims of such behavior are projects that do not achieve sufficient funding. But also the funders of these projects can be seen as victims because their favored projects cannot be completed. (iii) We argue that funding is beneficial when it helps a project to reach its funding goal, i.e., the required amount of money. Funding that exceeds this goal is mainly provided because individuals are attracted by the funding compensations, i.e., attractive rewards (Koch, 2016). Hence, funders continue funding although the goal is already reached. This part of funding, however, increases the visibility of this blockbuster project on the platform which distracts attention from other projects. Consequently, the funders need to carry the costs of putting only blockbuster projects in the middle of interest. (iv) According to our approach, individuals who continue funding will have to pay an additional tax τ on their funding. If the funding goal has been reached and a funder focuses on a reward for which s/he has to give an amount of funding z, the funder has to pay $z\,(1 + \tau)$ instead of z. Thus, the tax will counter the buy-side pressure that focuses on the rewards. The resulting tax yield is redistributed to those projects that have closely missed their funding goal so that these are finally successfully funded – starting with the project closest to its goal (in absolute terms). The tax has an important advantage over funding caps or maximal funding amounts because the funders are still allowed to fund the projects of their interest and do not lose their favorite options.

Simulation Results

We apply sensitivity analysis using the ABM for estimating an appropriate level of the tax to enhance overall funding outcomes. Figure 1 provides the result of this analysis for different levels of a tax for overfunded projects. First, we are able to show that the rate of successfully funded projects increases due to the redistribution (a). Moreover, we track both the sum (b) and the rate of successfully raised funds (c). While the sum of successfully raised funds is the amount of money invested into successfully funded projects, the rate of successfully raised funds is the share of funds that is given to projects that finally reach their funding goal. In other words, if this rate is 85%, 15% of the collected money is refunded because the related projects did not reach their funding goal. While the first graph (a) reveals a positive consequence from introducing a tax (rising rate of successfully funded projects), the second (b) and third graph (c) give indication that the tax also leads to negative effects (decreasing sum and rate of successfully raised funds).

While a rising rate of successfully funded projects is good for project initiators, a decreasing amount of raised funds is bad for platforms since their revenues are directly linked to the sum of successfully raised funds. Moreover, funders profit less from crowdfunding as the tax becomes some kind of transaction cost that is a hurdle to transactions, i.e., funding contributions. As a consequence, neither a tax of zero nor a high tax can be seen as an optimum.

In the case of rising taxes, there is an effect that reduces funding activity because a certain number of funders will refuse to spend the higher amounts for the rewards. For very high taxes which start to eliminate overfunding completely, the rate of successfully funded projects will even decrease again because less tax yield is available for redistribution. Nevertheless, low taxes do not have a great negative impact on funding activity. Moreover, opposed to the negative effect of increasing taxes, we expect an important positive effect for platforms: Higher rates of successfully funded projects (a) is likely to attract additional project initiators. In turn, funders are attracted because of a well-diversified portfolio of projects on the platform. Finally, the overall effect from a tax might even be positive for the platform operators, which redeems the lower sum of raised funds (b). Additionally, the funders may decide to fund earlier in order to avoid the additional costs. This effect would reduce funding hesitation at least if the project is close to its funding goal. In order to find the optimal tax level, an evaluation formula is needed to counterbalance the negative and positive effects of the tax. Applying such evaluation functions, the optimal tax can be calculated from simulation outcomes and the ABM can be used as a decision support tool.

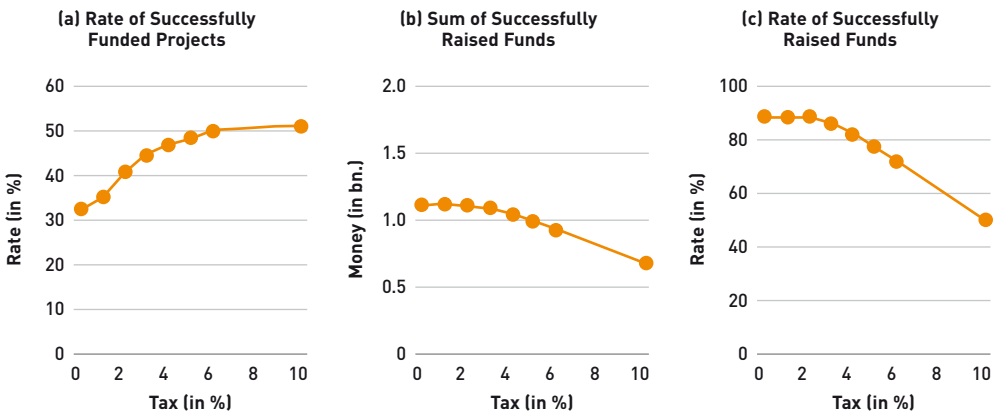

Figure 1: Sensitivity Analysis Results Considering Different Tax Levels

Conclusion

Our results show strong support for applying the proposed approach since the rate of successfully funded projects increases while the sum of successfully funded money only slightly decreases for low tax levels. In this sense, we deliver an interesting example of market engineering in the field of online crowdfunding platforms. Of course, in ABMs, simplifications are needed and a system's complexity has to be reduced by applying reasonable assumptions. We invite researchers and practitioners alike to further consider potential optimizations of crowdfunding models in order to improve benefits of crowdfunding for all stakeholders concerned.

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