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What about realized returns in reward-based crowdfunding?

von

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Zusammenfassung:

Crowdfunding is an alternative form of financing, especially for entrepreneurs in the early-stage development phase. It is well-known that for investors, beyond altruistic motives, material returns play a crucial role, too. A previous study in this field analyzed returns offered by founders and demanded by investors, resp., by means of a data set from kickstarter.com, a leading platform for reward-based crowdfunding. The present paper additionally looks at the realized returns from an ex post view. It does not present new empirical findings, but identifies problems and limitations in this field, and presents some suggestions for future research.

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List of abbreviations

e.g. for example

p. page

pp. pages

1 Introduction

In general, crowdfunding is the generation of funds for a project through a large number of people called backers, typically with the help of the Internet (Lehner, 2013). Thus, crowdfunding represents a process in which individuals and organizations, initiate commercial or non-commercial projects in a public announcement - in order to raise funding commitments, assess market demand, and build customer relationships. For this purpose, crowdfunding campaign participants can pledge monetary or non-monetary funds, the amount of which they are free to determine, on online or offline platforms in a specified period of time. The pledged funds are made available to the project if the pre-specified requirements (so-called pay out model) are met. Material or immaterial compensation for the providers of funds can, but need not, be provided for (Belleflamme/Lambert/Schwiebacher, 2014, p. 588; Moritz/Block, 2014, p. 60; Müllerleile/Joensen, 2015, p. 274; Heim, 2020, pp. 182-188). Based on this, four types of financing within crowdfunding are distinguished in the literature with the equity-based, loan-based, reward-based and donation-based models (Moritz/Block, 2014, pp. 61-62; Trost/Fox/Heim, 2017, pp. 135-137; Heim, 2020, pp. 182-188). This paper takes a closer look at reward-based crowdfunding, in which the investor receives intangible and/or tangible, but not financial benefits in return (Frydrych/Bock/Kinde/Koeck, 2014, p. 249; Mollick, 2014, p. 3). Research on reward-based crowdfunding has been driven forward strongly in recent years - and focuses primarily on the success factors in the financing of crowdfunding projects and the motives of the parties involved (Moritz/Block, 2014 pp. 64-80; Trost/Fox/Heim, 2017 pp. 131-132). The former will not be considered further in this paper, and the latter will focus on investor behavior.

In section 2, we give a brief survey on findings about the backers' motives. Section 3 recapitulates studies giving information concerning the role of returns as a motive for investing in reward-based crowdfunding projects. A motivation for examining the ex post realized returns is given in section 4, while Section 5 attempts to formulate some hypotheses in this context. Unfortunately, instead of presenting empirical results based on our data set, section 6 deals with the arising difficulties which future research will have to overcome. Section 7 summarizes the findings of this paper and their impact, for further research.

2 The motives of crowdfunding investors

Social and intrinsic motives are of great importance to investors in the context of crowdfunding (see e.g., the studies of Ordanini/Miceli/Pizzetti/Parasuraman, 2011; van Wingerden/Ryan, 2011, S. 52; Belleflamme/Lambert/Schwienbacher, 2014; Brem/Wassong, 2014; Allison/Davis/Short/Webb, 2015; Bretschneider/Leimeister, 2017; Steigenberger, 2017; Trost/Fox/Heim, 2017). In addition, there are studies dealing with the determinants of the profitability of crowdfunding projects against the background of investor motivation. Harms (2007) used an online survey of a hypothetical nature, and concluded that the investors' decision to invest depends on the possible economic value of the project as well as the presence of a possible tangible innovative output of the project. Ordanini/Miceli/Pizzetti/Parasuraman (2011) interviewed seven founders and managers of crowdfunding platforms to identify possible investors' motivations. According to the respondents, investors support a project for the following reasons: they are generally convinced of the crowdfunding idea, they want to commit themselves to innovative behavior, they can identify with the project, they want to help the initiators for social reasons, they want to become part of the project, or they want to generate a return. From this, the authors conclude that profitability is one important incentive for investors (Ordanini/Miceli/Pizzetti/Parasuraman, 2011). It has to be critically noted that the founder's opinions are highly subjective and speculative (Trost/Fox/Heim, 2017). Another explorative study comes from Brem/Wassong (2014). They interviewed 221 students about fictitious examples of crowdfunding projects. Their results showed that profitability is the main motivation for investors ahead of the delivery of the product itself, the support aspect and the sense of belonging to a project. The problem here is that due to the hypothetical decision-making situation, emotional aspects are likely to play a lesser role compared to the reality (Trost/Fox/Heim, 2017). Bretschneider/Leimeister (2017) see anticipation of a return or reward as an important motivation for investors alongside other social and intrinsic motives. However, it should be pointed out that they examined projects on an equity-based crowdfunding platform and derived statements from this for all forms of incentive-based forms of crowdfunding (reward, equity, and lending-based crowdfunding). Focusing on motives of investors' decisions to support crowdfunding projects, there are several studies in Behavioral Finance research, which deal with herd behavior (Zhang/Liu, 2012; Kuppuswamy/Bayus, (2013); Agrawal/Catalini/Goldfarb, 2013; Stadler/Thies/Wessel/Benlian, 2015; Bretschneider/Leimeister, 2017), home bias (Brem/Wassong, 2014; Lin/Viswanathan, 2015) or the feeling of solidarity (Ordanini/Miceli/Pizzetti/Parasuraman, 2011; Van Wingerden/Ryan, 2011; Berglin/Strandberg, 2013). In this context, some studies suspect limited rational behavior on the part of capital providers (Gerber/Hui, 2013; Agrawal/Catalini/Goldfarb, 2013, pp. 4-5; Brem/Wassong, 2014; Lin/Viswanathan, 2015). On the other hand, Trost/Fox/Heim (2017, p. 152) argue that the blanket assumption of bounded rationality is not compelling, at least with regard to the return aspect.

3 Findings on return seeking in reward-based crowdfunding

Trost/Fox/Heim (2017) examined the impact of the profitability on investors' decisions for real projects on the platform kickstarter.com (with the focus on technological projects). Their study indicates that profitability is an essential element of an investor's bundle of motivation (Trost/Fox/Heim, 2017 pp. 148-152). Cox/Nguyen/Kang (2018) also conclude that besides a large number of investors who are intrinsically motivated on their own, the majority of investors are - at least partially - motivated by material incentives. They use real data from the reward-based crowdfunding platform, fundanything.com.

Generally, in reward-based crowd funding, measurement on the basis of non-monetary returns becomes problematic. The return for the investor, on one hand, may consist of the delivered product itself (tangible reward). On the other hand, it could be the fact that the investor received the product before the non-investors (intangible reward) (Belleflamme/Lambert/Schwienbacher, 2014, pp. 586-587). Another intangible reward is being named, for example, in the credits of a financed film (Hemer/Schneider/Dornbusch/Frey, 2011, p. 53; Moritz/Block, 2014, p. 61). Trost/Fox/Heim (2017) suggest that the monetary evaluation of the benefit of such possible rewards, which distinguish rewards in reward-based crowdfunding, falls into four group; intangible rewards, standard products, products and services, and other rewards. They also attempt to evaluate them as objectively as possible according to different criteria. However, the authors point out that subjective influences could not be completely ruled out in the evaluation and that, in some cases, simplifying assumptions had to be made due to a lack of data (Trost/Fox/Heim, 2017, p. 151). The authors determined expected returns for the supply and demand side, in order to make corresponding statements on investor behavior (Trost/Fox/Heim, 2017, pp. 144-149). Since backers choose among the various pledge levels¹ offered by the founders of a crowd funding campaign, this distinction can be made by analyzing the demand for the different pledge levels. Return is calculated by means of the invested amount of money and the expected value of the reward. Of course, this makes sense only in the case of monetarized (material) rewards. As usual, returns must be annualized in order to make them comparable and to enable calculations.

Trost/Fox/Heim (2017, p.151) put forward the thesis that a positive return is predominantly expected with increasing pledge level amounts. At the same time, the majority of supporters tend to pledge small to medium contributions. Overall, supporters expect higher returns than the initiators of the offer. This suggests that investors do not act in a limited rational behavior, as some studies assume (Gerber/Hui, 2013; Agrawal/Catalini/Goldfarb, 2013, pp. 4-5; Brem/Wassong, 2014; Lin/Viswanathan, 2015), but tend to look for a positive return. Frydrych/Bock/Kinde/Koeck (2014, p. 254) argue that high funding per backer indicates that either a project attracts few backers who provide higher financial support or the project initiators were successful in getting backers to invest higher financial contributions in the project. Fox/Neuland (2020) found no clear evidence of a relationship between offered expected profitability and

¹ Pledge levels are the reward tiers that are offered to the backers of a campaign: the higher the invested amount the higher the rewards' value in the corresponding pledge level.

the size of the pledge level amount. They, however, found a marginal positive relationship between demanded expected profitability and the size of the pledge level amount. In this regard, Fox/Neuland (2020) argue that project creators are likely to offer their products without any particular association regarding size of the pledge level, whereas investors are more likely to look for products that are more profitable.

4 Why look at realized returns in reward-based crowdfunding?

As with any other investment, return-seeking investors in a crowdfunding campaign are faced with the task of weighing up the expected return against the risk involved, regardless of whether the expected (material) return is of a monetary or non-monetary nature. Therefore, the issue of realized returns in crowdfunding comes into play. Could the returns promised by the project initiators be achieved by the investors? What about deviations between expected and realized returns?

There are only a few studies that explicitly deal with the question of what happens to the crowdfunding projects after they have been financed. Signori/Vismara (2018) investigated the probability of survival of equity-crowdfunded firms. The authors found that a significant proportion of companies raised additional capital after the crowdfunding campaign. They concluded that while early crowdfunding investors do not necessarily generate a monetary return, it is still a key indicator of a prospect of returns. At the same time, the authors found that investors have an 18% chance of losing their money (Signori/Vismara, 2018). In the area of reward-based crowdfunding, Mollick (2014) first addressed the question of when project initiators get to deliver their promised rewards. Based on 381 successfully funded kickstarter.com projects in the categories of “Design” and “Technology” with a clearly defined outcome, he concluded that fraud is not a major problem and the failure rate is relatively low at 3.6%. At the same time, a large proportion of goods and services were delivered late (Mollick, 2014, p. 11). Picking up on this theme Mollick (2018) conducted a more extensive study in collaboration with the kickstarter.com platform, with 47,188 backers responding. Mollick (2018) concludes that the overall failure rate for kickstarter.com projects range from 5% to 14%, but the question of whether a project should be considered a failure varies greatly from investor to investor. However, Mollick's studies are solely concerned with the question of whether and when the projects delivered the goods and services, and do not look at associated returns (Mollick, 2014; Mollick, 2018).

5 Some questions concerning realized returns in reward-based crowdfunding.

As displayed above, returns are relevant for investment decisions in crowdfunding. Due to the fact that the market for crowdfunding projects is not information efficient, not all historical results from other crowdfunding projects can be used to estimate returns of future projects due to the lack of comparability. It therefore seems reasonable to look at whether the expected returns offered and demanded - show a correlation with the returns actually realized within the same project, i.e. to look for the informative value of expected returns. Firstly, it seems worthy to investigate whether positive offered returns in the individual pledge levels are an indication for investors on whether positive realized returns can be achieved. So, we formulate our first question:

Q1: Is there a positive relationship between the offered expected return of a pledge level and the realized return of a pledge level?

Besides the value of the reward, the delivery time for the rewards is an important component of the realized return and has a negative impact on the successful completion of a campaign (Kunz/Bretschneider/Erler/Leimeister, 2017). Such relationships are already known from retail, where fast delivery has a positive effect on customer satisfaction (e. g. Moschuris/Velis, 2012). The second question is therefore formulated as follows:

Q2: Is there a positive relationship between the demanded expected return of a pledge level and the realized return of a pledge level?

Based on the above mentioned research by Fox/Neuland (2020), the pledge level amount should also be discussed as an influencing factor for realized returns in order to be able to identify other possible correlations:

Q3: Is there a relationship between the size of a pledge level amount and the realized return of a pledge level?

6 Some obstacles to the analysis of realized returns in reward-based crowdfunding

Why do we use the term 'question' instead of 'hypothesis' in the forgoing section? In fact, we would have used the latter one if our data set would have allowed sound empirical analysis. Unfortunately, this was not the case. But in our opinion, the difficulties in obtaining a suitable data set may be seen as an impact for

further research - as much as the questions we derived from the findings of existing studies. We will explain this by the data set already used in Trost/Fox/Heim (2017)².

6.1 Data sample

We collected data between May 16 and May 19, 2013 on 45,400 projects from one of the world's largest crowdfunding platforms, kickstarter.com. A special characteristic of kickstarter.com is the "all-or-nothing approach" of fundraising on the online platform, meaning that a project can only be successful if it is fully funded. Nevertheless, it is also possible that funded projects can exceed their original funding goal. While the projects date back to 2013, we assume that there are no fundamental differences compared to the behavior of investors today. The publicly available data was collected using a specially developed web crawler. The variables recorded include the amount requested by the project initiators, the funding period, the number of updates, the number of comments, and the number and amount of the various pledge levels, including the number of bids per pledge level. The project comes into being and the amounts are called up when they reach a predefined total figure. Furthermore, the start date of the campaign and, if available, the official web presence was included. The resulting data set was then cleaned of projects that could not be evaluated³. The study presented here is limited to those 596 successfully financed projects which were assigned the category "Technology"⁴. Technology projects lend themselves particularly well to the study, as they usually contain the project result as a tangible return, thus facilitating or even enabling the monetary evaluation of the success in contrast to, for example, cultural projects. In our next step, we evaluate each pledge level; a predefined category list following Trost/Fox/Heim (2017), identifying intangible and tangible products, as well as services and other returns that backers may get for their donation and their investment, respectively. Intangible products can take the form of acknowledgements or mentions by name, for example. Although this form of reward is frequently used by project initiators, it only has a subjective value for the respective supporter, which, generally, cannot be assessed in monetary terms. The group of standard products includes quid pro quos - such as pens, buttons, T-shirts or key rings. These were monetarized using average prices for comparable products. If the supporter receives the product developed with their help at the end of the project term, this type of reward falls in the third group. The products or services in this group were monetarized with the help of current selling prices, which were usually found in the project initiators' online stores. If no comparable prices could be determined, the pledge level was assumed as the selling price. All other possible returns, such as vouchers, discounts, participation in various events, workshops, etc., were evaluated with the help of internet research, where in some cases, it was necessary to resort to estimated values. Projects, for which the reward could not be evaluated despite extensive research, were removed from the data set. Subsequently, we calculated the expected profitability in reward of using

² Cf. this paper for more detailed information and further references.

³ This may be the case, for example, due to missing data or overtly facetious content. The remaining data set comprises 37,726 projects, of which 48.3% were successfully funded (Müllerleile/Joenssen, 2015, p.276).

⁴ At the time, funded projects on the kickstarter.com platform were categorized as art, comics, crafts, dance, design, fashion, film and video, food/drink, games, journalism, music, photography, publishing, technology, and theatre (Trost/Fox/Heim, 2017, p. 142).

the minimum amount of pledge level and a manually collected and quantified comparison price⁵. Projects without any identifiable return were deleted from the database. Ultimately, this resulted in 530 projects, with a total of 4,285 pledge levels (Trost/Fox/Heim, 2017, p.142). While the previous explanations only referred to expected returns, the realized returns for the individual pledge levels were determined in the final step. Therefore, additional information on the delivery of the rewards offered, was needed to determine the realized return.

6.2 Various problems in the empirical evaluation

For further analysis, it is necessary to determine the annualized offered expected return. The annualized demanded expected return and the annualized realized return. The following variables are needed for this:

- offering price,
- estimated value of the reward,
- number of backers,
- end of the campaign date,
- planned delivery date,
- actual delivery date.

In the data set, there is no difference between the value of the reward in the ex ante or the ex post view. In fact, the opposite would occur only under very special circumstances, for example, if the market value of the delivered product turned out to be substantially higher than expected ex ante. Further, from a technical point of view, we were only able to observe ex post values since at the time we collected the data, the campaign and the investment decision were lying in the past. Therefore, differences between expected and realized returns can only result from deviations between the promised and the actual day of delivery and from default (which is an extreme case of this difference). Thus, time (the speed of delivery), is the only driver of changes from annualized ex ante to annualized ex post returns. Notably, we found that data could not be identified for all 4,285 pledge levels. For a total of 1,497 pledge levels, the planned delivery date or the delivery date were not determinable. In this context, 80% of the missing data resulted from non-existent information on the delivery date. The reasons for this, for example, could be that the pledge level was not supported by backers or that the project failed completely and no products were sent. Accordingly, only 2,788 pledge levels were available for further investigation. If we compare the planned delivery date for these pledge levels with the actual delivery date for these pledges, the following picture emerges:

⁵ The question of how accurately supporters were able to estimate this expected return ex ante in individual cases must be left open, as of course it was not possible to interview supporters.

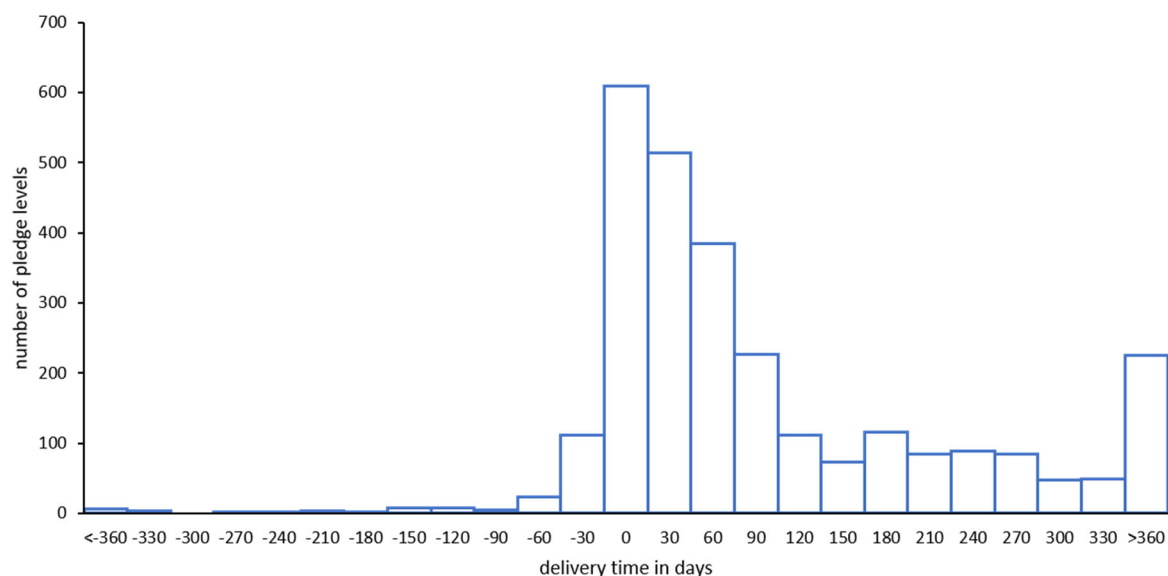


Figure 1: Delivery time in days per number of pledge levels

Accordingly, the delivery time is 124 days on average, with a median of 67 days. This means that 50% of backers will get their products before 67 days and the other 50% will get their products later than 67 days. Only 28 % of the pledge levels in the sample received their rewards less than 30 days after the planned delivery date. In 5% of the pledge levels considered, the items were already shipped before the planned delivery date (negative delivery time). Accordingly, 72% of pledge levels are more than 30 days late – 25% are more than half a year late. A more in-depth analysis of the delivery times - including possible delays was, unfortunately, not possible as the corresponding data was not available on Kickstarter in every case.

Another problem arose with pledge levels that had a negative offered expected return. When calculating the annualized return, values smaller than -100 % were often found. Since the interpretation of these results did not seem reasonable, all pledge levels with negative offered and demanded expected returns were excluded⁶. A total of 1,608 pledge levels were affected, which is why only 1,180 pledge levels were available for further analysis. This also seems to be a plausible course of action, since investors only expect positive returns and it is only in exceptional cases when the offered expected returns are negative. At the same time, Trost/Fox/Heim (2017, p. 145), as described above, show that supporters definitely prefer pledge levels with a positive return. More than 35 % of the remaining 1,180 pledge levels have an annualized offered expected return of more than 300% - the mean value is 820 %. This is due to the fact that there are often only a few days between the end of the campaign date and the planned delivery date, which leads to very high annualized returns in the calculation.

For the analysis, this means that only about 27% of the pledge levels from the initial data set can be used in the study. Thus, bias cannot be ruled out, as the selection of pledge-levels in the analysis was based primarily on the availability of project data. Additionally, the difference between the annualized offered or demanded expected returns and the annualized realized returns is solely based on the speed of delivery. As a result, the

⁶ Alternatively, we could have set all this returns to -100%.

conclusions that can be drawn from the data analysis are similar to those of Mollick (2018), which was also only able to answer the question of whether and when the promised products and services could be delivered. Thus, further evaluation of the data does not seem to make much sense against the background of the current state of knowledge. Rather, it must be ensured in advance for future investigations that the relevant data can still be accessed after the end of the project. However, due to the small size of most projects (Trost/Fox/Heim, 2017, p.135), this seems unlikely, since a low level of professionalism can often be assumed here.

7 Conclusion and hints for future research

Disappointments are part of science. In our paper, we sought to examine the relationship of the offered, the demanded, and the size of a pledge level amount with the realized returns. While the determination of the first three factors could be realized by Trost/Fox/Heim (2017), various problems arose in the determination of the realized returns.

- Firstly, there were major problems with data collection because project information was no longer available on Kickstarter, or only incomplete, and information on the respective websites of the projects was also not meaningful in every case. As a result, statements on delivery times and failure rates could only be made for some of the projects. This showed that only a small proportion of the promised recoveries were actually delivered on time. However, no statistically significant statements could be made from this. In future studies, it would be desirable to maintain close contact with project initiators and investors. It is questionable whether this is a realistic requirement in practice.
- Secondly, the many negative offered expected returns resulted in annualized returns that could not be interpreted. These limitations then led to results that could no longer be meaningfully evaluated. In the future, it will be necessary to exclude them from the analysis. Otherwise, the results would be distorted, even with sufficient data material.
- Thirdly, we note that the usual concept of annualized returns has to be reconsidered on whether it is an appropriate criterion in the case of reward-based crowdfunding. Not only is the effect of negative returns disturbing, but also the in part enormous returns, and more precisely - the enormous variations of returns over the sample, resulting from the annualization.
- Lastly, considering that the return effects result solely from shifts in the delivery date, it is questionable whether the derived insights are as enlightening as desired. At least, this may be different in the case of default.

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