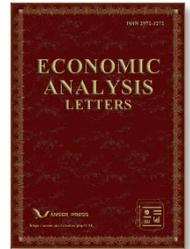




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Financial returns in reward-based crowdfunding

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ABSTRACT

We quantify financial returns to backers in reward-based crowdfunding projects on Kickstarter and show that such investments provide profitable opportunities in addition to non-monetary benefits. The average unconditional annualized return is 11.5% and the average return on successful projects is 30%. Hence, backing money near the end of a campaign, when the probability of success is already high, is a profitable strategy. The most attractive is the Design category, where successful projects yield 73%, on average. Short-term projects are more profitable than long-term ones. Financial return is an important type of extrinsic motivation in reward-based crowdfunding, which has generally been neglected in academic literature. Reward-based crowdfunding outperforms other forms of crowdfunding and other common alternative investments.

KEYWORDS

Crowdfunding; investor motivation; alternative investments; alternative finance; entrepreneurial finance

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1. Introduction

A popular way of raising initial funding for start-ups and small businesses is crowdfunding. Crowdfunding is defined as raising relatively small amounts of money from relatively large number of people over the internet to fund a cause, project, company, or goal. Crowdfunding is usually done on a specialized website (platform). Although it is commonly perceived that investors participate in crowdfunding campaigns for non-financial reasons (e.g., Collins and Pierrakis, 2012; Schweinbacher and Larralde, 2010), we show that this market provides high financial returns in addition to non-financial benefits and can be used by small individual investors as an alternative investment.

There are four major types of crowdfunding: reward-based, equity-based, lending-based and donation-based. The reward-based model offers non-pecuniary tangible or intangible rewards in exchange for the investment, the equity-based model offers any shareholding contractor a revenue sharing scheme, the lending-based model provides a credit contract without an intermediary, and the donation-based model offers a donor contract without any physical or monetary rewards (De Buysere et al., 2012; Cholakova and Clarysse, 2015). The most established and popular type is the reward-based crowdfunding, where examples of rewards include a product itself, a ticket to a concert, a lunch with the creditor, a signed DVD, a labelled T-shirt, an honor to name a game hero.

In this paper, we look at reward-based crowdfunding from the perspective of an investor (backer, pledger). Is it pure altruism to finance others' projects? There has been some debate concerning investors' motivation for participation, particularly in reward-based crowdfunding. Gerber et al. (2012) conducted a series of interviews with crowdfunding participants and revealed two types of motivation: intrinsic and extrinsic. Intrinsic motivation includes a desire to help others, to be a part of a similar-minded community, to support a creator or a cause. Extrinsic motivation is to "collect rewards", which generally means the desire to being the first to receive a product or getting a limited-edition or personalized product. According to previous inductive research, project pledgers also enjoy getting involved in, and supporting projects that offer the perception of a shared identity (Muniz and O'Guinn, 2001) or motivated by social image and reputation (Andreoni, 1990). Such non-financial motives are perceived to be more important for investors in reward-based crowdfunding than the reward itself (Collins and Pierrakis, 2012).

However, Cholakova and Clarysse (2015) provide survey evidence in favour of the opposite. Their results show that "the decision to pledge to a project was positively predicted by individuals' interest in receiving rewards, as well as by their need to trust the entrepreneur, whereas non-financial motives, such as help others and support ideas or be a part of a community were not significant" (Cholakova and Clarysse, 2015).

We contribute to this debate by studying one more type of motivation – the financial motivation of getting the product cheaper than in the general market. We are the first to quantify the financial returns on reward-based crowdfunding projects and to show that such projects are, in fact, quite profitable for backers. Whereas a financial return is an obvious motivation for equity-based crowdfunding (Collins and Pierrakis, 2012) and crowdlending (Daskalakis and Yue, 2017), where the average annualized returns have been estimated at 8.8% (Signori and Vismara, 2016) and 7.7% (Adhami et al., 2019), respectively, the reward-based crowdfunding is generally not viewed as an investment opportunity with high financial returns, and the main motivation is perceived to be of non-monetary nature. However, we show that the average annualized unconditional return on reward-based crowdfunding, calculated as the percentage difference between the monetary value of the received product and the pledged amount, is higher than in equity- and lending-based crowdfunding - 11.5%. Backers benefit from so-called "behavior-based price discrimination" between backers and regular customers (Belleflamme et al., 2013). Moreover, we find, that the average return on successful projects, i.e., projects which achieved the funding goal, is even higher – about 30%. Reward-based crowdfunding also outperforms other types of traditional and

alternative investments.¹ Hence, the high financial return is an additional important type of extrinsic motivation, which has not been identified in the previous interview-based or survey-based studies.

We collect data on all projects posted on Kickstarter, the biggest global reward-based crowdfunding platform with over 17 million backers, who have pledged about \$5 billion in total.² Kickstarter has a satellite tracker site, kicktraq.com, which stores information on past and present, successful and unsuccessful campaigns. We sample the projects with a funding goal above \$250,000, and actual products to be delivered in order to be able to quantify the returns. Our sample includes 297 projects in Games, Technology and Design categories, funded during 2015-2020. Kickstarter uses All-or-Nothing funding model, which means that if a funding goal is not reached during the campaign, the funds are returned to the pledgers, and the creator receives no funding. 60% of the projects in our sample failed to reach the funding goal and yielded zero return to the pledgers. The other 40% of the projects were successful and generated an average return to investors of 28.88% per annum.

The cross-sectional analysis reveals that the most profitable projects belong to the Design category (the average unconditional return is 24.82% and the average return on successful projects is 73%), followed by Technology (14.17% and 36.43%, respectively), followed by Games (5.77% and 13.77%, respectively). We also study various project characteristics which could potentially predict the returns on successful campaigns. However, the only significant predictor we find is the length of the project – the (promised and actual) time between the start of the project and the delivery of the rewards. Short-term projects tend to yield higher annualized returns than longer-term projects.

Together with the findings on factors, which determine the success of a crowdfunding campaign (e.g. quality of the project and geography (Levin, 2015), the social capital (Zheng et al., 2014) and activity in social networks of the creators (Harmeet and Gera, 2017), the funding goal, the number of updates and the length of the campaign (Mollick, 2014)), the findings of this study generate further recommendations for investors in reward-based crowdfunding projects.

The rest of the paper is organized as follows. Section 2 reviews related literature about investor motivation in different types of crowdfunding. Section 3 describes the data and methodology of calculating returns in reward-based crowdfunding. Section 4 presents the descriptive statistics and section 5 presents a regression analysis of determinants of project returns. Section 6 concludes.

2. Investor motivation in crowdfunding

Investor motivation in crowdfunding is a complex matter because contributors are not regular investors, who only care about financial returns, they also value various non-monetary benefits. Such motivations are classified as extrinsic and intrinsic, respectively (Ryan and Deci, 2000). Gerber et al. (2012) identify 4 main types of motivation from interviews with crowdfunding investors (3 intrinsic and 1 extrinsic): to help others (particularly, friends and family), to be a part of a community (i.e., to interact with the founder and similar-minded backers), to support a creator or a cause (i.e., to help a project get off the ground) and to collect rewards (to be the first to receive a product or to get a limited-edition or personalized product). Bretschneider et al. (2014) survey related literature and propose a bigger classification with 7 intrinsic and 3 extrinsic motivations for crowdfunders. The intrinsic motivations are: fun and enjoyment, interest and curiosity, altruism, reciprocity from a fundraiser to fund others' projects, direct identification with a fundraiser (being a friend or a family member), indirect identification (sympathy or emotional affection for a fundraiser), and regional proximity. The extrinsic motivations are:

¹ Popular alternative investments such as art, precious metals and stones, postage stamps, fine wines and LEGO yield annualized average returns from 3% to 11% (e.g. Renneboog and Spaenjers, 2012 and 2013; Dimson and Spaenjers, 2011; Dimson et al., 2015; Dobrynskaya and Kishilova, 2022). The US equity market grew by 14% during 2015-2020, the time period considered in this paper.

² <http://www.kickstarter.com>

recognition, personal need in the reward, and financial return.

Whereas both extrinsic and intrinsic motivations are observed in all types of crowdfunding, particular motivations dominate. For example, in donation-based crowdfunding, investments are mostly driven by intrinsic motivations such as altruism, reciprocity or identification. On the other hand, financial returns are perceived to be more important in equity-based crowdfunding and peer-to-peer lending (Cholakova and Clarysse, 2015; Vismara, 2016, Adhami et al., 2019). Signori and Vismara (2016) estimate the average return on equity-based crowdfunding of 8.8% per annum, and Adhami et al. (2019) estimate the average return on crowdlending of 7.74%. These estimates seem plausible given that equity investments are associated with high risk than lending. However, Daskalakis and Yue (2017) report that whereas “financial return” was the most common motivation in crowdlending, “interest and excitement” and “increased diversification” were more popular responses than “financial return” in equity crowdfunding.

Reward-based crowdfunding falls in between, where different motivations co-exist, and there is a debate as to which type of motivation – intrinsic or extrinsic – drives investments. Several studies have shown that intrinsic motivation (such as enjoyment, helping creators and supporting projects) plays a key role in reward-based crowdfunding (e.g., Gerber et al., 2012; Collins and Pierrakis, 2012; Agraval et al., 2014). Cholakova and Clarysse (2015) come to the opposite conclusion that nonfinancial motives play no significant role. More recently, Ryu et al. (2020) find from mapping survey responses to actual transaction data that altruistic motivation is associated with early funding whereas reward motivation is associated with funding at a later stage in a crowdfunding campaign.

We contribute to this debate by studying financial returns as an extrinsic motivation in reward-based crowdfunding. Unlike most previous studies, we do not conduct surveys or interviews, but rather rely on actual data for completed crowdfunding projects to estimate historical returns.

3. Data

We collect data on all projects posted on Kickstarter during 2015-2020. Kickstarter is the largest reward-based crowdfunding platform, which was established in 2009 and became popular in 2012, with over \$7 million backed per month.³ We end the sample in 2020 in order to track the projects until their realization and delivery of the rewards, which takes 26 months, on average. The data are collected by a parser from Kicktraq.com – Kickstarter’s satellite tracker site.

Kickstarter uses an All-or-Nothing funding model: funds are transferred to the creator and the projects are realized only if the funding goal is met by the end of the campaign.⁴ Otherwise, the funds are returned to the investors. We sample the projects with a funding goal above \$250,000 in order to concentrate on big projects, which lead to a creation of a new product. We omit projects which collected less than 5% of the goal in order to exclude joke or unrealistic projects. We consider only USD-based projects to avoid currency conversion issues and exchange rate risk. We also restrict our sample to three project categories: Design, Technology and Games – the ones, where a new product is likely to be delivered.⁵ After applying these filters, we end up with 297 projects in the sample.

The reward-based crowdfunding model usually offers a variety of rewards for different tiers of donation, one of which is usually the product itself. Possible donations range from \$5 to several thousand dollars. For each reward tier, the creator specifies the respective reward and an estimated time when the reward is going to be delivered.

³ “Happy Birthday Kickstarter!” - The Kickstarter blog, available at <http://www.kickstarter.com/blog/happy-birthday-kickstarter>.

⁴ Overfunding is quite common, however. The average overfunding per campaign is 30% in our sample.

⁵ We exclude films, video and music, because such products often become available on internet for free later, so it is hard to quantify the returns. We also exclude charity projects such as opening a museum or preserving a historical building. Intrinsic motivation of backers is probably the most important for such categories.

For each project in the sample, our parser collects the following information: the project category, the funding goal, the actual amount of money collected, the number of backers, the reward tiers, the dates of the campaign and the estimated reward delivery dates. The actual reward delivery is determined by tracking projects' updates on shipping. We calculate the promised (actual) project length as the time from the start of the campaign until the promised (actual) delivery of the rewards.

We also hand-collect prices of the products in the retail market when the products become available. We use the following sources: the official website of the creator, the Kickstarter page, Amazon, other internet retailers, and finally eBay. For most released products, the retail prices are available on either the official website or Kickstarter. For video games, we check prices on Steam. If a product's retail price changed over time, we use the first price at which it became available to consumers.

The expected annualized return for backers is calculated as follows:

$$E[r_i] = \frac{\text{Retail price} - \text{Price on Kickstarter}}{\text{Price on Kickstarter}} \times \frac{12}{\text{Project length in months}}$$

where the price on Kickstarter equals the amount pledged by an investor according to the chosen tier.

Since the project length is calculated from the start of the crowdfunding campaign, whereas many backers pledge money towards the end of the campaign (i.e., one month later, on average), our estimates represent the returns for 'early backers', and the actual returns for 'late backers' are higher.

4. Descriptive statistics

Table 1 reports characteristics of successful and failed projects. Only 40% of projects in our sample achieved the funding goal (and were overfunded, on average), and subsequently delivered the rewards. The successful projects do not differ from failed ones in terms of size (the average funding goal is about \$450,000) and length of the crowdfunding campaign (about 1 month), however the average pledged amount is half as low (\$150.7 versus \$328). Therefore, a possible reason for project failure is that the entry barrier for pledgers is too high.

Table 1. Characteristics of successful and failed projects.

	All projects	Successful projects	Failed projects
Funding goal (\$)	452,237	473,424	438,270
Actual funding (\$)	640,610	1,460,498	100,610
Length of campaign (days)	35.5	34.13	36.4
Annualized return (%)	11.5	28.9	0
Product price on Kickstarter (\$)	257.6	150.7	328
Product retail price (\$)	-	213.1	-
Actual time until reward delivery (months)	-	26.4	-
Promised time until reward delivery (months)	-	11.6	-
Number of observations	297	118	179
Percentage of observations	100	40	60

Note: The table reports the descriptive statistics of reward-based crowdfunding projects on Kickstarter, and separate statistics of successful and failed projects.

In successful campaigns, the amount invested is usually significantly lower than the value of the corresponding rewards. Hence, the average annualized return is high (26.4%). The average return of the failed projects is zero, because the funding was simply returned to the backers. The average expected return on reward-based crowdfunding is 11.5%. This is surprisingly higher than the estimated returns on equity-based crowdfunding (8.8% per annum in Signori and Vismara, 2016) despite a common belief that investors of reward-based crowdfunding are more motivated by non-monetary rewards than investors of equity-based

crowdfunding. Therefore, our results suggest that extrinsic motivation, in terms of obtaining a product much cheaper, is important for investors.

The creators of the successful projects delay the delivery of the rewards by 14 months, on average (in line with Mollick, 2014). Whereas the promised length of the project, which includes the production of the good, is about 1 year, the actual time between the start of the crowdfunding campaign and the delivery of the rewards is 26 months.

Table 2 reports the descriptive statistics of projects by category: Games, Technology and Design. The Games category is the biggest category with the highest number of projects (155), the highest average funding goal (\$526,000), the highest rate of success (42%), the longest time until the rewards delivery (34 months) and the lowest annualized unconditional returns (5.77%) and the lowest return on successful projects (13.77%). It seems to be the least attractive category for investments.

Table 2. Project characteristics by category.

	Games	Technology	Design
Funding goal (\$)	525,835	365,039	385,773
Actual funding (\$)	660,286	375,226	1,112,134
Length of campaign (days)	32.5	37.7	40.9
Success rate (%)	42	39	34
Annualized unconditional return (%)	5.77	14.17	24.82
Annualized return on successful projects (%)	13.77	36.43	73.00
Product price on Kickstarter (\$)	31.1	490.6	543.4
Product retail price (\$)	40.3	496.4	648.0
Actual time until reward delivery (months)	33.7	19.1	13.2
Promised time until reward delivery (months)	15.1	7.6	6.8
Number of observations	155	95	47
Percentage of observations	52	32	16

Note: The table reports the descriptive statistics of reward-based crowdfunding projects on Kickstarter, divided by category.

The Design category is, on the contrary, the smallest (47 projects), the fastest in terms of rewards delivery (13 months) and the most profitable, despite a lower success rate (34%). The unconditional return is 24.82% and the average return on successful projects is 73%. Such a huge return is, perhaps, the reason why this category is highly overfunded. The actual funding exceeds the funding goal by 3 times, on average.

The Technology category is in between with the descriptive characteristics similar to the average ones on Kickstarter. The unconditional return on Technology projects is 14.17%, the success rate is 39%, and the return on successful projects is 36.43%.

5. Determinants of returns on successful projects

The determinants of the success of a crowdfunding campaign (i.e., achieving the funding goal) have been analyzed in a number of studies. Authors name the quality of the project, geography, the social capital and activity in social networks of the creators, the funding goal and the length of the campaign among the factors (e.g. Mollick, 2014; Zheng et al., 2014; Levin, 2015; Harmeet and Gera, 2017). Of course, these factors also affect unconditional expected returns on crowdfunding campaigns, which are equal to the success probability times the conditional returns on successful projects. In this paper, we concentrate on the second component in this equation. We explore which project characteristics are determinants of the returns on already successful campaigns.

Among the potential factors, we consider the scale of overpricing, measured by the actual funding divided by the funding goal, as a signal of backers' expectations about the potential returns. We consider the product price on

Kickstarter as a measure of size, and the project length (promised and actual time until the reward delivery) as a measure of production cycle. We also consider the crowdfunding campaign characteristics, which have been named as the factors of success (Mollick, 2014): the funding goal, the length of the campaign and the number of updates during the campaign.

We estimate panel regressions of project annualized returns on the above-mentioned project characteristics including category and year fixed effects. Table 3 reports the estimates of three alternative specifications in columns. The only significant explanatory variable is the project length in columns 2 (promised) and 3 (actual): the longer-term the project, the lower the return. Short-term projects are more profitable because the rewards are received sooner. The promised project length, as stated in the Kickstarter campaign, is a good predictor of the actual project length, and a significant negative predictor of the returns. Other project characteristics appear to be statistically insignificant in determining the expected returns.

Table 3. Predictors of returns on successful projects.

	(1)	(2)	(3)
Overfunding	0.016 (0.016)	0.015 (0.016)	
Kickstarter price	0.00016 (0.00026)	0.00011 (0.00026)	
Actual time until reward delivery	-0.0095** (0.0037)		
Promised time until reward delivery		-0.032** (0.012)	
Funding goal/\$100,000			-0.0199 (0.0228)
Length of campaign			0.0031 (0.010)
Number of updates during campaign			-0.0036 (0.0085)
Constant	0.80*** (0.28)	0.72** (0.27)	0.70 (0.46)
Category and year fixed effects	Yes	Yes	Yes
Number of observations	118	118	118
F-statistics	2.13	2.2	1.29
P-value	0.033	0.027	0.25
Adjusted R ²	0.08	0.09	0.02

*Note: The table reports the coefficients of alternative regressions of returns of successful projects on various project characteristics. Standard errors are reported in parentheses. ** denotes significance at 5% confidence level, *** denotes significance at 1% confidence level.*

6. Conclusion

Investments in reward-based crowdfunding campaigns give backers a variety of benefits, such as enjoyment in participating in a creation of a new product, being a part of a similar-minded community, altruistic pleasure of helping others, or a non-altruistic pleasure of receiving a personalized or a limited-edition product or non-physical rewards (e.g., a visit to the production or a lunch with the creator). Apparently, backers in reward-based crowdfunding are also compensated by high financial returns. They receive the product significantly cheaper than the price, at which the product appears in the market. We find that the average annualized return on big Kickstarter projects, which lead to a creation of a new product, is 11.5%, which is higher than the stock market return and the returns on equity- and lending-based crowdfunding campaigns. The average return on successful projects, which achieved their funding goals, is even higher - 30%. Therefore, pledging money near the end of the crowdfunding campaign, when it is easier to estimate the probability of success, is a profitable strategy, which many backers, in fact, follow.

Projects in different categories are not equally attractive. The most profitable is the Design category, where the average return on successful projects is 73%. The least profitable is the Games category, where successful projects yield only 14%, on average. Short-term projects, which deliver rewards quickly, are more attractive than long-term projects, *ceteris paribus*.

Whereas the previous research on crowdfunding is based on surveys, interviews and designed experiments, this empirical study of finished projects on Kickstarter provides quantitative evidence on the profitability of crowdfunding campaigns and suggests one additional important type of motivation of backers – the financial motivation – which has been neglected in the literature.

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Conflict of interest

The authors claim that the manuscript is completely original. The authors also declare no conflict of interest.

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