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Working Paper

Which updates during an equity crowdfunding campaign increase crowd participation?

Research Papers in Economics, No. 6/16

Provided in Cooperation with:

University of Trier, Department of Economics

Suggested Citation: Block, Jörn Hendrich; Hornuf, Lars; Moritz, Alexandra (2016) : Which updates during an equity crowdfunding campaign increase crowd participation?, Research Papers in Economics, No. 6/16, Universität Trier, Fachbereich IV – Volkswirtschaftslehre, Trier

This Version is available at:

<https://hdl.handle.net/10419/156252>

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Which updates during an equity crowdfunding campaign increase crowd participation?

Abstract: Start-ups often post updates during equity crowdfunding campaigns. Yet, little is known about the effects of such updates on funding success. We investigate this question by using hand-collected data from 71 funding campaigns on two German equity crowdfunding portals. Using a combination of qualitative and quantitative empirical research techniques, we find that posting an update has a significant positive effect on the number of investments by the crowd and the investment amount collected by the start-up. This effect does not occur immediately in its entirety; rather, it is lagged by a few days. The positive effect increases with the number of words of the update. Distinguishing by the content of the update, we find that the positive effect can be attributed to updates on new funding and business developments and updates on promotional campaigns run by the start-up. Updates on the start-up team, business model, cooperation projects, and product developments do not have meaningful effects. Our paper contributes to the literature on the effects of information disclosure on equity crowdfunding success and offers potential guidance for start-ups in designing effective and successful equity crowdfunding campaigns.

1. Introduction

Equity crowdfunding is an important tool for young and innovative start-ups to collect early stage funding. Prior research has investigated the success drivers of equity crowdfunding campaigns and has shown that information provided by the start-up, such as the human and social capital of the founders, risks involved, and financial projections, have a positive influence on campaign success (Ahlers et al., 2015; Moritz et al., 2015; Vismara, 2016). This information is static and provided by the start-up before a campaign starts.

Our paper takes a dynamic perspective and investigates the role of updates provided by start-ups during an equity crowdfunding campaign. We analyze how start-ups can use updates provided during the campaign to encourage the crowd to provide funding. This determinant of equity crowdfunding success has been overlooked in the literature so far, and thus, there is an important gap in the literature on the effects of information disclosure on equity crowdfunding success (Ahlers et al., 2015; Bernstein et al., 2015; Moritz et al., 2015; Vismara, 2015). Thus far, this literature has not taken a dynamic perspective and has overlooked the actions and behavior of start-ups *during* equity crowdfunding campaigns. Most research has examined how particular static characteristics of start-ups, such as details about the entrepreneurial team (Ahlers et al., 2015; Berkovich, 2011; Duarte et al., 2012) or the location of the start-up (Agrawal et al., 2015), and characteristics of the crowdfunding campaign, such as the product video, the quality of the information provided and the existence of financial projections (Ahlers et al., 2015), determine crowdfunding or equity crowdfunding success.

Moreover, from a practical perspective, it is worthwhile to learn more about the effects of updates on equity crowdfunding success. By posting updates, start-ups can actively influence the chances of successfully completing their equity crowdfunding campaigns. Knowing which updates drive funding success is crucial for start-ups to design an effective and successful equity crowdfunding campaign.

We investigate the effect of updates posted by start-ups during an equity crowdfunding campaign by using hand-collected data from 71 funding campaigns and 39,399 investment decisions on two German equity crowdfunding portals. Using a combination of qualitative and quantitative empirical research techniques, we find an overall positive effect of posting an update on the number of investments by the crowd and the investment amount collected by the start-up. However, this positive effect does not occur immediately in its entirety; rather, it is lagged by a few days. It increases with the number of words of the update and decreases with the amount of updates already

posted during the equity crowdfunding campaign. Large differences exist when we distinguish updates based on their content. Updates on the start-up team, business model, cooperation projects, and product developments do not have meaningful effects on funding success. Rather, the positive effects of updates on funding success can be mainly attributed to updates on new funding and business developments and updates on promotional campaigns run by the start-up.

The remainder of the paper is organized as follows. The next section introduces the data sources and the qualitative empirical research techniques used to code and categorize the updates provided by the start-ups during the funding campaign. Based on this, we introduce the variables used in the quantitative regression analysis and explain our empirical model. The section that follows presents the descriptive and multivariate results. The final section discusses our results, links them to the existing crowdfunding literature and summarizes our contributions to theory and practice.

2. Data and methods

2.1. Data sources

Our empirical investigation uses data from two German equity crowdfunding portals over the period from June 7, 2012, to April 27, 2015. The two portals are Seedmatch and Companisto, which are important players in the German equity crowdfunding market and together represent about 75% of the overall crowdfunding capital raised during the observation period. For Companisto, we hand collected data on all 36 campaigns that were completed until the end of the observation period. For Seedmatch, we were able to hand collect data on 29 of 78 campaigns. We could collect investment data on only about half of the campaigns for Seedmatch because the portal takes information about individual investments immediately off the website once the campaign terminates. We therefore could not collect data for the campaigns that ended before June 7, 2012. For some campaigns, we were too slow to hand collect the data from the website.

Some start-ups such as Meine-Spielzeugkiste ran two campaigns on the same portal. Furthermore, Aoterra, Controme, Ledora, Payme, Protonnet and Riboxx reached their funding limit very quickly and subsequently decided to raise more capital. On average, it took these founders six days to initiate the campaign again. We have counted these rounds as independent campaigns, as investors could not anticipate that a second round would quickly follow the end of the first round and thus most likely did not adapt their investment behavior accordingly. Overall, we were able to analyze 39,399 investment decisions within 71 unique funding campaigns. With the individual investment

decisions, we then constructed a panel data set that aggregates the number of investments in a particular campaign on a given day. The time dimension of the panel data set is the duration of the campaign in days, while the cross-sectional dimension refers to the campaigns.

2.2. Key explanatory variables

To identify the information included in the updates posted by the start-up, we adopted a mixed method approach that builds on both qualitative and quantitative techniques of data analysis. In particular, we used qualitative research methods to develop a coding system that categorizes the information contained in the campaign updates. For this purpose, we used the software package MaxQDA, which allowed us to analyze qualitative data. In a first step, we generated an initial list of update categories based on our prior knowledge and previous research on investment decisions in equity crowdfunding (Hornuf and Schwienbacher, 2015; Moritz et al., 2015; Moritz and Block, 2015; Vismara, 2015, 2016). During the coding process, we expanded this initial coding system by using an iterative and inductive process to cover all relevant information provided by the updates (Miles and Huberman, 1994). Then, we merged similar categories and finally developed a system of categories with higher dimensions (Gioia et al., 2012; Miles and Huberman, 1994). Our final coding system consists of nine categories of updates: *Team*, *Business Model*, *External Certification*, *Product Development*, *Cooperation Projects*, *Campaign Development*, *New Funding*, *Business Development*, and *Promotions*. The length of the updates posted by the start-ups ranged from a few words to complete paragraphs.

The category *Team* contains all the information about the firm's founders and employees, such as their education, age and personal interests. In the category *Business Model*, we coded updates on the firm's business model, market, business idea, future business orientation and expansion aspirations. *External Certification* comprises updates where the start-ups informed investors about external certification through expert opinions, recommendations, awards won by the start-up, patent applications, press coverage and participations at trade fairs, conferences or organized talks. The category *Product Development* contains information about the firm's product, target customers, new product innovations and introduction of prototypes. Information about new cooperation projects by the start-up is coded in the category *Cooperation Projects*. *Campaign Development* contains information about developments of the crowdfunding campaign, such as the current number of investors, funding amount, and announcements about increases in the funding limit. Financing provided by other market participants, such as business angels, venture capitalists or the

government (i.e., public grants or subsidies), is included in the category *New Funding*. The category *Business Development* contains information about the financial development of the start-up (e.g., sales development and turnover) as well as customer updates (e.g., the number of customers or new customers). Finally, the category *Promotion* contains information about promotions, networking via social media, current events to meet crowd investors and appeals to investors to support the company with marketing activities or recommendations. A detailed overview of the categories, including some examples, is provided in Table 1 of the Appendix.

To ensure that our coding system is reliable and coherent, detailed explanations were provided for each category. Then, a second researcher, who was not involved in the project, coded 20% of the updates. This allowed us to ensure that the coding categories were exhaustive and that they have a high degree of objectivity. The inter-rater reliability using Cohen's Kappa indicated good agreement between us and the external researcher (the average Cohen's Kappa for all categories was 0.65) (Fleiss et al., 2003; Landis and Koch, 1977). To permit even higher consistency in the coding, the coding system was then discussed with the external researcher and adapted when necessary. Afterward, both researchers again coded all 234 updates of the 71 equity crowdfunding campaigns. Once again, an inter-rater reliability analysis was conducted to ensure coding consistency between the researchers. Again, we used Cohen's Kappa as a statistical measure of inter-rater reliability for the coding of the nine main update categories. Cohen's Kappa for the individual categories ranged from 0.70 to 0.96; the average Cohen's Kappa of 0.84 for all categories indicates excellent agreement between us and the external researcher.

2.3. Control variables

Following prior research on funding dynamics in equity crowdfunding (Hornuf and Schwienbacher, 2015; Vismara, 2015), we included several control variables in our baseline regression. To account for campaign success before the update occurred, we control for the amount of capital raised until the previous day ($\ln(\text{Amount})_{0 \rightarrow t-1}$). While this variable indicates *how much capital* has been invested, it does not capture *how many investors* supported the campaign and whether more investors might provide a signal regarding the collective wisdom of the crowd. Since we cannot uniquely identify investors across portals by using their name and location (i.e., there might be two or more Thomas Muellers living in Munich and investing on the two portals), we consider the number of investments to be the best available proxy for the number of investors that have invested until the previous day ($\# \text{Investments}_{0 \rightarrow t-1}$).

Hornuf and Schwienbacher (2015) show that investments accelerate once the funding goal is reached and once the investor is certain to receive funding. We therefore include the dummy variable *Post Funded*, which equals 1 if the funding goal is reached and 0 otherwise. Furthermore, we include a variable that captures the number of active campaigns across four major German equity crowdfunding portals, including the two portals in our data set as well as Innovestment and United Equity (*Number of Active Campaigns*).¹ Similarly, we include a variable that captures the number of investments made on these four portals on a given day (*Number of Competing Investments*). This variable is included to capture potential “Blockbuster Effects” (Kickstarter, 2012; Doshi, 2015), where a popular and widely visible campaign steals investors away from other campaigns. Vismara (2016) shows that equity retention influences crowdfunding success. Since start-ups on German equity crowdfunding portals do not issue equity shares but some mezzanine form of investment (i.e., equity shares are too expensive to transfer as a costly notary has to be involved), we calculate the *quasi*-equity share offered to the crowd. This is the percentage of the minimum amount of capital requested (*Funding Goal*) over the pre-money valuation of the firm (*Equity Share*). Finally, to control for portal characteristics, we include a dummy variable (*Seedmatch*) that is equal to 1 if the campaign is run on Seedmatch and 0 if it is run on Companisto.

2.4. Dependent variables and empirical models

We use two dependent variables: the number of investments and the amount of capital pledged in an equity crowdfunding campaign on a given day. Because the first dependent variable is measured as a count variable and because its unconditional variance suffers from overdispersion, we estimate a negative binomial regression model. The results of a Hausman test led us to dismiss the random-effects estimator as being inconsistent. We therefore estimate a fixed-effects negative binomial (FENB) model, which is a pseudo panel estimator that allows us to include time-invariant measures into the regression, such as the variables *Equity Share* and *Seedmatch*. Furthermore, the FENB estimator allows us to remove any time-invariant heterogeneity from the equity crowdfunding campaigns, such as the type of financial contract used, specific clauses that have been defined or the industry of the start-up. In our baseline specification, we estimate the following FENB model:

¹ We do not consider the portals Innovestment and United Equity in our analysis, as the former does not allow founders to post updates on the portal website and as we simply did not observe updates during the running of the campaigns for the latter.

$$\Pr (y_{i1}, y_{i2}, \dots y_{iT}) = F (\text{Ln}(\text{Amount})_{i,0 \rightarrow t-1} + \# \text{Investments}_{i,0 \rightarrow t-1} + \text{Post Funded}_{it} + \text{Number of Active Campaigns}_t + \text{Number of Competing Investments}_t + \text{Post Funded}_{it} + \text{Equity Share}_i + \text{Seedmatch}_i + \mathbf{Campaign}_{it} + \mathbf{DoW}_t + \mathbf{MoY}_t + \mathbf{Year}_t + \mathbf{DoIC}_{it}),$$

where y is the number of investments in campaign i on day t . $F(\cdot)$ represents a negative binomial distribution function as in Baltagi (2008). We specify campaign fixed effects denoted by **Campaign**. **DoW** is a vector of dummies that indicates the day of the week. **MoY** is a vector of dummies for the month of the year. **Year** is a vector of dummies for the years from 2013 onward. In line with Kuppaswamy and Bayus (2014), **DoIC** is a vector of dummies that indicates the first and last seven days of the funding campaign.

For the second explanatory variable, which measures the amount of capital that was pledged on a given day, we run a simple OLS panel regression. The results of a Hausman test again led us to dismiss the random-effects estimator as being inconsistent. We therefore run a standard OLS fixed-effects panel model. However, this model does not allow us to identify time-invariant campaign effects, as the time-invariant heterogeneity will be differenced out. We therefore can no longer identify the effect of the variables *Equity Share* and *Seedmatch*. The baseline OLS model takes the following form:

$$\text{Ln}(\text{Amount})_{it} = \text{Ln}(\text{Amount})_{i,0 \rightarrow t-1} + \# \text{Investments}_{i,0 \rightarrow t-1} + \text{Post Funded}_{it} + \text{Number of Active Campaigns}_t + \text{Number of Competing Investments}_t + \text{Post Funded}_{it} + \mathbf{Campaign}_{it} + \mathbf{DoW}_t + \mathbf{MoY}_t + \mathbf{Year}_t + \mathbf{DoIC}_{it} + a_i + u_{it..}$$

3. Results

3.1. Summary statistics

Updates

For the 71 equity crowdfunding campaigns over the period from June 7, 2012, to April 27, 2015, we observe 5,210 campaign days, which are defined as days when investors had the opportunity to invest in a specific equity crowdfunding campaign. Overall, the start-ups running these campaigns posted 234 updates, with an average of 3.30 updates per equity crowdfunding funding campaign. However, while some start-ups did not post a single update, others have extensively used this tool to inform the crowd and encourage investor participation. During the campaign of MyParfum, for instance, a total of 14 updates were posted. Interestingly, some update categories were posted more

frequently than others. For example, investors were more often informed about the business model, the latest product developments and the external certifications of the start-up than about recent campaign developments or the start-up team. Start-ups rarely disclosed updates on new funding. During most of the campaign days, no update was posted. During an average campaign day, investors could expect to read 0.04 updates on the website of the portal. Put differently, every 25 days, start-ups posted an update and occasionally even posted two updates on the same day. The mean update contained 289 words (median: 248 words). Given that no update was posted most of the time, investors could expect to read 12.82 words per campaign day.

Campaigns

The 71 campaigns were run by 63 unique start-ups. Some start-ups ran multiple campaigns on different or sometimes the same portal. All of the start-ups are located in Germany. Most of them operate in the information and communication, wholesale and retail, and manufacturing sectors. The majority of the start-ups are incorporated under the traditional German private limited liability form *GmbH* (86%), which has a minimum capital requirement of 25,000 €, half of which has to be paid at the time the firm incorporates. The remaining start-ups operate as sole proprietors (3%) or use the new legal form *UG* (11%), which does not require a minimum amount of capital for establishment. The mean pre-money valuation of firms that they jointly determine with the portal was 3.3 million € (median: 2,100,000 €). Many start-ups offered profit-participating loans (*partiarische Nachrangdarlehen*) to the crowd (86%), while the remainder of the start-ups provided silent partnership agreements. By January 1, 2016, 14% of the start-ups either were liquidated or were involved in a pending or closed insolvency procedure. Overall, 16% of the start-ups obtained additional venture capital or business angel financing after the equity crowdfunding campaign. Regarding the campaign development, on 86% of the campaign days, the start-ups had already surpassed the funding goal, and the founders of the start-up thus knew that they would ultimately receive crowdfunding (*Post Funded*). Moreover, during a given campaign day, on average, 6.55 campaigns were taking place in addition to the particular campaign under consideration.

– Table 1 and Figure 1 here –

Table 1 shows that, on average, 7.56 investments were made on campaign days and that 5,886.74 € was pledged by the crowd. On some days, the crowd invested as much as 1.5 million € in a single campaign, while on other days, they withdrew 10,000 € of investments. On average, 436.85 investments were made before an investor decided to invest. On a given campaign day, 40.37 investments were made in the overall market, and 6.55 campaigns were run in addition to the campaign under consideration. Table 2 shows a correlation table that includes the dependent variables and the main independent variables.

– Table 2 here –

3.2. Results of the baseline regression models

Table 3 shows the regression results for our baseline models regarding the number and amount of investments. For the FENB model, we report incident rate ratios, which can be interpreted as multiplicative effects or semi-elasticities. All specifications account for campaign, day-of-the-week, month, year and day-of-funding-cycle effects, which are jointly and individually significant at the 1% significance level.

Number of investments

We find that the number of previous investments has a negative effect on the number of investments on a given day. This result is in line with prior research showing that investment dynamics in equity crowdfunding under a first-come, first-serve mechanism slow down over the time period of the campaign (Hornuf and Schwienbacher, 2015). By contrast, we find no such effect for the amount that was previously invested. Furthermore, having reached the funding goal did not induce more investors to engage in the campaign, nor did the number of currently active campaigns steal investors away from a particular campaign. When other campaigns received more investments, the campaign under consideration was also more successful. This may result from a general boom in the equity crowdfunding sector after periods of extensive media coverage positively reporting about this method of financing. The percentage of *quasi-equity* offered by the start-up did not affect the crowd's willingness to participate in a campaign. Portal differences exist, however, with Seedmatch campaigns attracting on average 61% fewer investments than Companisto campaigns, which is

likely due to the fact that the minimum investment ticket of Seedmatch is 50 times larger than the 5 € minimum ticket of Companisto.

Amount invested

The regression results regarding the amount invested are very similar overall. For example, we find that the number of previous investments reduces the overall amount pledged on a given campaign day. In the period after a campaign is successfully funded, the investment amounts on a given day decrease by 63%. The number of investments made in other campaigns has a positive effect on the overall amount invested on a given day: with 100 more investments taking place across all active campaigns, the investment amount pledged to the campaign under consideration increases by 24%.

– Table 3 here –

3.3. Number and length of updates and their effect on crowdfunding success

Table 4 shows regression results for the effect of the number of updates on the number of investments and the amount invested by the crowd. The number of updates on a given campaign day² has a positive and statistically significant effect on both variables, with one additional update on a given campaign day increasing the number of investments by 16% and the amount pledged by 36%. The effect is even stronger for the day after the update was posted, with 28% more investments being made and a 64% greater amount being invested. The magnitude of the effect is very similar when considering the number of updates posted during the previous week. Furthermore, we find that the positive impact of updates wears off through extensive use, with the first updates during a campaign having a greater impact on the number of investments and the amounts invested than subsequent updates. Figure 2 shows the predictive margins for the baseline OLS model considering the rank of an update during the campaign period on the number of investments. We find that after 10 or more updates have been posted, additional updates no longer have a statistically significant effect. Finally, we find that providing more text in an update has a positive effect on investments, with 100 more words increasing the number of investments by 4% and the amount invested in a given campaign day by 9%. We investigate whether this increase in funding arises because more information is provided in the next section.

² Most often, this variable is a dummy variable. In rare cases, two updates are posted on the same day, and we want to account for this fact.

– Table 4 and Figure 2 here –

3.4. Update categories and their effect on crowdfunding success

Table 5 shows the results of regressions investigating how the different update categories influence the investments by the crowd. Except for updates on *Campaign Developments*, none of the other categories has any effect on the number of investments on the same day of posting. Providing information about the development of the campaign has a positive effect on crowd investment. This effect, however, might also be due to reverse causality with the update being posted because the campaign is going well. We also do not find any significant effects when considering the number of investments on the following day. Yet, when looking at the long-run effect of updates over the course of an entire week, we find that information about *New Funding* and *Business Development* attracts additional investors, thereby increasing the number of investments by 51% and 22%, respectively. Analyzing the amount invested, we find that information about *New Funding* and *Business Development* increases the amount of funding on subsequent days. Moreover, information about *Cooperation Projects* also has a positive effect on the amount invested by the crowd. When looking at the effect of updates over the course of an entire week, we can confirm the positive effects of the update categories *New Funding* and *Business Development*. *External Certification*, in contrast, has a negative effect on the amount invested, which might arise because updates on external certificates provide a negative signal to the crowd: these start-ups are unable to obtain funding other than equity crowdfunding even though they have obtained an external certificate such as a patent.

– Table 5 here –

4. Discussion and conclusion

We began with the question of whether and how updates posted by start-ups during an equity crowdfunding campaign influence crowd participation. Our results show that there is indeed a statistically and economically significant effect of updates on crowdfunding success. Posting an update increases both the number of investments by the crowd and the investment amount collected.

This effect, however, does not occur immediately in its entirety; rather, it is lagged by a few days. It also increases with the number of words contained in the update. Our results further show that the type of information provided in the update plays an important role. Updates that inform the crowd about new funding and business developments and updates that inform the crowd about promotional campaigns run by the start-up have a positive effect, whereas updates on the start-up team, its business model, its cooperation projects, and its product developments have no effect.

Our paper contributes to the small but growing literature on the effects of information disclosure on equity crowdfunding success (Vismara, 2015; Bernstein et al., 2015; Ahlers et al., 2015; Moritz et al., 2015; Moritz and Block, 2015). Thus far, this literature has taken only a static perspective and has not taken into account that start-ups can also provide or disclose information to the crowd while running an equity crowdfunding campaign. Our paper takes such a dynamic perspective and investigates disclosure effects.

The results of our paper are important for early stage start-ups seeking equity crowdfunding. Knowing which updates drive funding success is crucial for start-ups when designing an effective and successful investor communication and social media strategy for their equity crowdfunding campaign. By posting updates, start-ups can actively influence the chances of success of their equity crowdfunding campaigns. The crowd seems to be particularly sensitive to information about new funding and business developments, whereas additional information about the underlying business model, team, and cooperation partners does not provide much informational value. Thus, the crowd values updates that provide information about the working and success of the start-up's business model but does not value additional information about the structure, content and type of business model. Moreover, the crowd values updates with verifiable and business-related information, preferably about the (predicted) financial success of the start-up and its business model. By contrasts, soft information that provides more details about the business model and the start-up team is not positively valued. In this sense, the crowd seems to behave as professional investors who focus on verifiable, business-related and cash-flow relevant information as decision criteria for their investments (Boocock and Woods, 1997).

Our paper is not without limitations, which provide fruitful avenues for further research. Our sample size of 71 funding campaigns and 39,399 investment decisions is still relatively small. This sample size does not allow us to build larger subgroups of start-ups from different industries, countries and development stages. Future research could collect larger samples of funding campaigns and investigate potential moderation effects related to start-up or campaign characteristics. We would expect, for example, to see stronger positive effects of updates on patents

and successful prototypes in technology-intensive industries than in other industries. Our subsample of start-ups in technology-intensive industries is too small to investigate such moderation effects (see Figure 1). Moreover, with a larger sample of start-ups and campaigns at hand, one could compare lone founder start-ups with team start-ups. It might very well be that updates on new team members have particularly meaningful effects for lone founder start-ups, where the founder lacks technological and/or business competences. Another possible avenue for further research is to extend the research about the effects of updates on crowdfunding success to reward-based crowdfunding (Colombo et al., 2015; Mollick, 2014). Mollick (2014), for example, has shown that projects with updates are more likely than other projects to attract funding from the crowd. However, he does not take a dynamic perspective and does not distinguish between different types of updates. Given the particularities of reward-based crowdfunding and its strong focus on products and projects, we would expect updates with information about project and product developments to have particularly strong effects.

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Table 1: Summary statistics

This table shows summary statistics of our main variables. All variables are defined in Table 1 in the appendix.

Variable	Mean	Median	Std. Dev. (overall)	Std. Dev. (between)	Std. Dev. (within)	Min.	Max.	N Obs.
# Investments	7.56	3	26.56	133.54	19.14	0	1107	5,210
Amount	5,886.74	1,000	34,134.60	18,0791.10	24,356.27	-10,000	1,499,750	5,210
Ln(Amount)	5.98	7	3.18	2.35	2.76	0	14	5,201
# Investments $0 \rightarrow t-1$	436.85	315	387.95	303.35	166.38	0	1966	5,210
Ln(Amount) $0 \rightarrow t-1$	11.85	12	1.88	1.85	1.41	0	16	5,210
Post Funded = 1	0.86	1	0.35	0.27	0.23	0	1	5,210
Active Campaigns	6.55	7	2.36	2.20	1.43	0	12	5,210
Competing Investments	40.37	25	67.05	17.97	64.86	0	1158	5,210
Equity Share	2.36	2	1.55	1.51	0.00	1	8	5,210
Seedmatch = 1	0.45	0	0.50	0.50	0.00	0	1	5,210
# Update	0.04	0	0.21	0.09	0.20	0	2	5,210
Update Rank	0.49	0	2.32	0.99	2.26	0	14	5,210
Update Wordcount	12.82	0	70.42	18.19	69.09	0	939	5,210
Update Categories	Yes							
Team = 1	0.01	0	0.09	0.02	0.09		41	5,210
Business Model = 1	0.02	0	0.14	0.07	0.14		110	5,210
External Certification = 1	0.02	0	0.13	0.02	0.13		91	5,210
Product Development = 1	0.02	0	0.14	0.03	0.13		97	5,210
Cooperation Projects = 1	0.01	0	0.11	0.02	0.11		67	5,210
Campaign Development = 1	0.01	0	0.10	0.06	0.10		51	5,210
New Funding = 1	0.00	0	0.05	0.01	0.05		15	5,210
Business Development = 1	0.01	0	0.12	0.02	0.12		75	5,210
Promotions = 1	0.02	0	0.14	0.06	0.14		102	5,210

Table 2: Correlation matrix: update categories

Correlation matrix of main variables

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
# Investments	[1]										
Ln(Amount)	[2]	0.31									
Team = 1	[3]	0.16	0.05								
Business Model = 1	[4]	0.13	0.04	0.43							
External Certification = 1	[5]	0.03	0.04	0.17	0.47						
Product Development = 1	[6]	0.12	0.05	0.33	0.53	0.34					
Cooperation Projects = 1	[7]	0.03	0.02	0.24	0.55	0.45	0.36				
Campaign Development = 1	[8]	0.07	0.05	0.06	0.23	0.24	0.20	0.16			
New Funding = 1	[9]	0.01	0.02	0.12	0.14	0.32	0.05	0.15	0.07		
Business Development = 1	[10]	0.06	0.03	0.23	0.47	0.50	0.32	0.42	0.20	0.18	
Promotions = 1	[11]	0.08	0.05	0.33	0.41	0.38	0.41	0.30	0.34	0.12	0.25

Table 3: Baseline regression

This table shows results of our baseline regressions as specified in section 2.4. Next to the variables reported in the table, the baseline regressions also include dummy variables for the campaign, day of the week, month of the year, year effects, as well as the first and last seven days of the campaign. Other variables reported below are defined in Appendix Table 1. The dependent variable in column (1) is the number of investments and in column (2) the $\ln(\text{amount})$ of investments in a specific campaign and day. The data takes panel-data structure. The method of estimation in column (1) is the negative binomial fixed effects panel estimator and in column (2) the OLS fixed effects panel estimator. Significance levels for coefficients being different from 1: ** < 5%, *** < 1%.

	# Investments (NB) (1)		Ln(Amount) (OLS) (2)	
$\ln(\text{Amount})_{0 \rightarrow t-1}$	1.04	(0.49)	0.08	(0.67)
# Investments $_{0 \rightarrow t-1} / 100$	0.91***	(0.00)	- 0.32***	(0.00)
Post Funded = 1	1.06	(0.64)	- 0.63**	(0.03)
Active Campaigns	1.02	(0.39)	- 0.05	(0.41)
Competing Investments / 100	1.08***	(0.00)	0.24***	(0.00)
Equity Share	0.89	(0.24)		
Seedmatch = 1	0.39***	(0.00)		
Fixed Effects				
<i>Campaign</i>	Yes		Yes	
<i>Day-of-Week</i>	Yes		Yes	
<i>Month</i>	Yes		Yes	
<i>Year</i>	Yes		Yes	
<i>Day-of-Funding-Cycle</i>	Yes		Yes	
Standard errors	<i>bootstrapped</i>		<i>clustered on campaign level</i>	
Wald Chi2	7963.18		-	
Adj. R2	-		0.14	
Prob.	0.00		0.00	
N (Investments Days)	5,209		5,201	
N (Campaigns)	70		71	

Table 4: Effects of number of updates

This table shows results of our baseline regressions as specified in Section 2.4 as well as additional variables. The results of the baseline regression remain largely unchanged and are therefore not reported again. Next to the variables reported in the table, the regressions also include dummy variables for the campaign, day of the week, month of the year, year effects, as well as the first and last seven days of the campaign. Other variables reported below are defined in Appendix Table 1. The dependent variable in columns (1) to (5) is the number of investments and in columns (6) to (10) the ln(amount) of investments in a specific campaign and day. The data takes panel-data structure. The method of estimation in columns (1) to (5) is the negative binomial fixed effects panel estimator and in columns (6) to (10) the OLS fixed effects panel estimator. Significance levels for coefficients being different from 1: ** < 5%, *** < 1%.

	# Investments (Negative Binomial)					Ln(Amount) (OLS)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
# Update	1.16** (0.08)					0.36*** (0.10)				
# Update _{lag 1}		1.28*** (0.06)					0.64*** (0.15)			
# Update _{lag 1 → 7}			1.24*** (0.05)					0.59*** (0.13)		
Update Rank				1.01** (0.01)					0.03*** (0.01)	
Update Wordcount / 100					1.04** (0.02)					0.09*** (0.03)
All Fixed Effects Included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard errors	<i>Bootstrapped</i>					<i>clustered on campaign level</i>				
Wald Chi2	5,015.35	5,812.78	7,126.70	5,272.71	5,962.35	-	-	-	-	-
Prob.	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Adj. R2	-	-	-	-	-	0.14	0.14	0.15	0.14	0.14
N (Investment Days)	5,209	5,209	5,209	5,209	5,209	5,201	5,201	5,201	5,201	5,201
N (Campaigns)	70	70	70	70	70	71	71	71	71	71

Table 5: Effects of update categories

This table shows results of our baseline regressions as specified in Section 2.4 as well as additional variables. The results of the baseline regression remain largely unchanged and are therefore not reported again. Next to the variables reported in the table, the regressions also include dummy variables for the campaign, day of the week, month of the year, year effects, as well as the first and last seven days of the campaign. Other variables reported below are defined in Appendix Table 1. The dependent variable in columns (1) to (3) is the number of investments and in columns (4) to (6) the $\ln(\text{amount})$ of investments in a specific campaign and day. The data takes panel-data structure. The method of estimation in columns (1) to (3) is the negative binomial fixed effects panel estimator and in columns (4) to (6) the OLS fixed effects panel estimator. Significance levels for coefficients being different from 1: ** < 5%, *** < 1%.

explanatory variables lag	# Investments (NB)			Ln(Amount) (OLS)		
	none	1 day	1 week	none	1 day	1 week
	(1)	(2)	(3)	(4)	(5)	(6)
Team = 1	1.05 (0.16)	0.97 (0.14)	1.07 (0.11)	-0.10 (0.32)	-0.22 (0.35)	0.29 (0.20)
Business Model = 1	1.12 (0.14)	0.90 (0.11)	0.89 (0.07)	-0.31 (0.28)	-0.13 (0.31)	0.01 (0.22)
External Certification = 1	0.87 (0.15)	1.11 (0.12)	1.10 (0.12)	0.02 (0.24)	-0.32 (0.28)	-0.43** (0.21)
Product Development = 1	0.90 (0.11)	1.12 (0.11)	1.08 (0.08)	0.31 (0.25)	0.22 (0.24)	0.13 (0.14)
Cooperation Projects = 1	1.17 (0.17)	1.03 (0.10)	0.98 (0.09)	0.17 (0.25)	0.55** (0.24)	0.30 (0.20)
Campaign Development = 1	1.25** (0.11)	1.10 (0.16)	1.17* (0.10)	0.09 (0.27)	0.60* (0.32)	0.29 (0.19)
New Funding = 1	0.76 (0.21)	1.30 (0.22)	1.51*** (0.23)	0.43 (0.69)	0.79** (0.37)	0.64** (0.25)
Business Development = 1	1.22 (0.16)	1.19 (0.14)	1.22*** (0.09)	0.06 (0.23)	0.57** (0.27)	0.67** (0.26)
Promotions = 1	1.12 (0.11)	1.19* (0.12)	1.10 (0.07)	0.41* (0.24)	0.36 (0.27)	0.33** (0.17)
All Fixed Effects Included	Yes	Yes	Yes	Yes	Yes	Yes
Standard errors	<i>bootstrapped</i>			<i>clustered on campaign level</i>		
Wald Chi2	6,388.37	9,201.82	7,967.91	-	-	-
Prob.	0.00	0.00	0.00	-	-	-
Adj. R2	-	-	-	0.14	0.14	0.15
N (Investments Days)	5,209	5,209	5,209	5,201	5,201	5,201
N (Campaigns)	70	70	70	71	71	71

Figure 1: Start-up distribution across sectors

The figure reports descriptive statistics for sectors in which equity crowdfunded start-ups are operating.

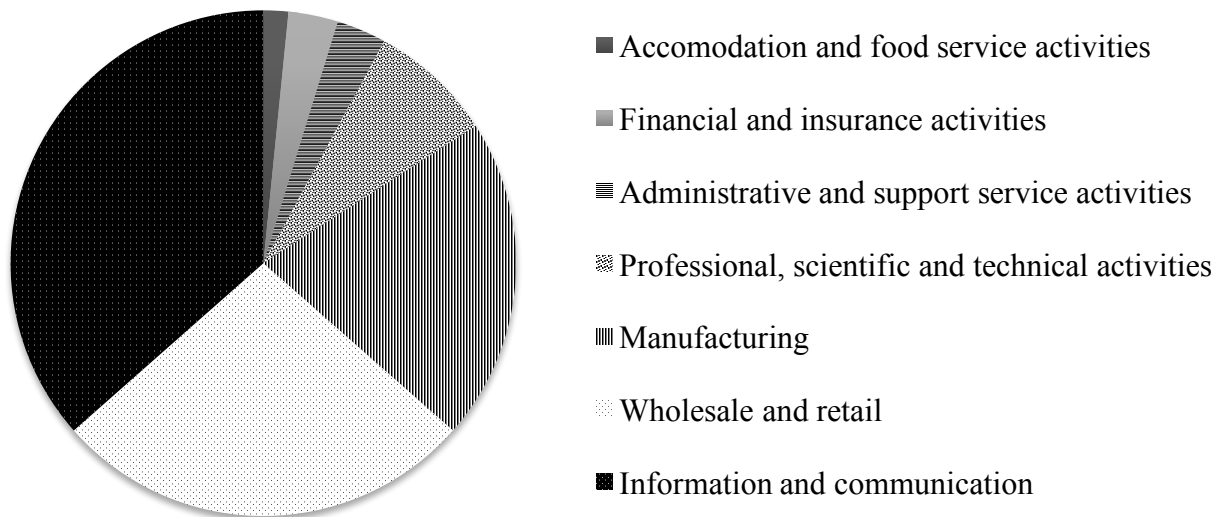
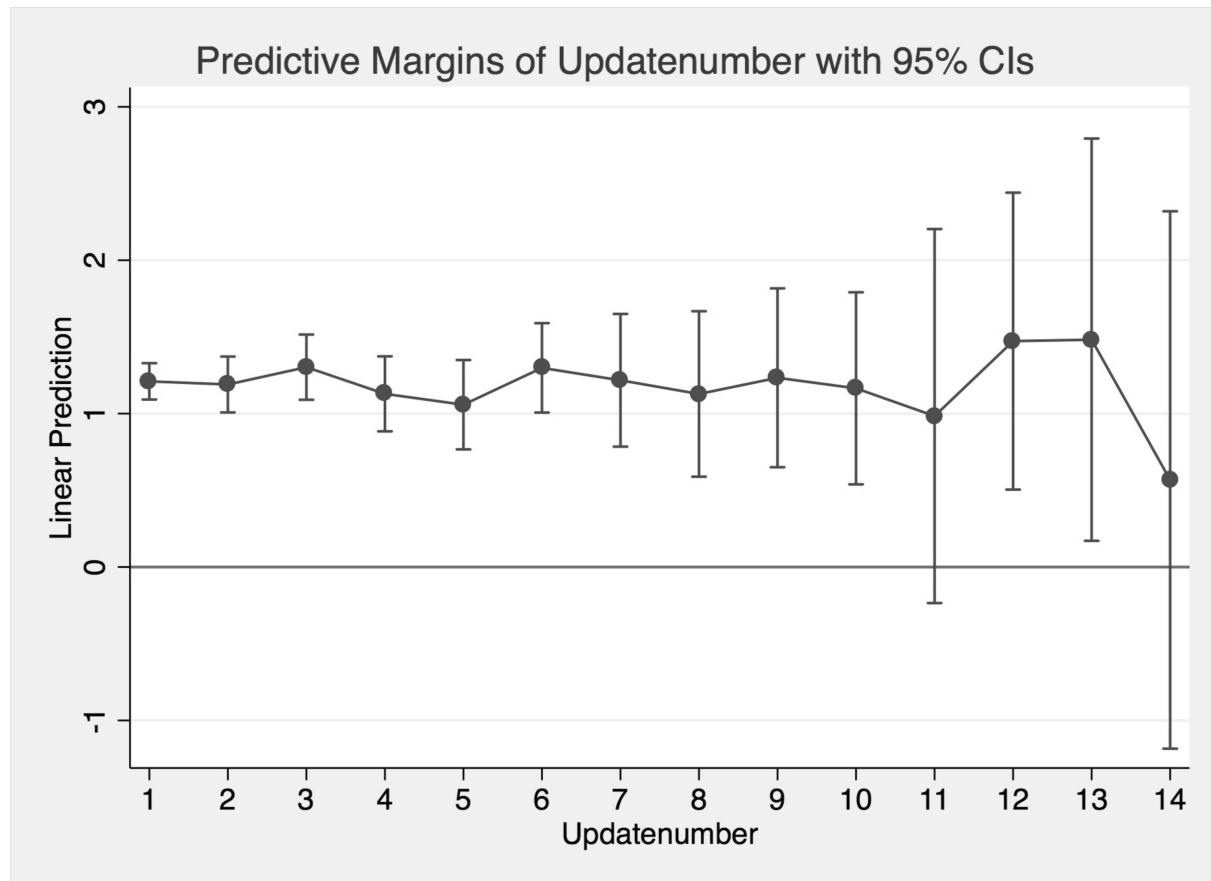


Figure 2: Predictive margins regarding the effects of updates

The figure reports predictive margins for the rank of an update in an equity crowdfunding campaign. It reveals that updates 1 to 10 have positive and significant effects. If the start-up posted 11 updates in a given campaign, the last update has no longer a statistically significant effect.



Appendix

Table 1: List and definitions of variables

<i>Dependent variable:</i>	
Ln(Amount):	The amount of money in EUR invested by crowd investors on day t in a particular campaign i.
# Investments:	The number of investments made by crowd investors on day t in a particular campaign i.

<i>Explanatory Variables:</i>	
Ln(Amount)_{0 → t-1}:	The natural logarithm of the total amount of money in EUR invested by the crowd earlier than day t in a particular campaign i.
# Investments_{0 → t-1}:	The total number of investments made by the crowd earlier than day t in a particular campaign i.
Post Funded:	Dummy variable equal to 1 if the campaign has surpassed the Funding Goal, and 0 otherwise.
Active Campaigns:	The total number of campaigns across three major and one minor German equity crowdfunding portal (Seedmatch, Companisto, Innvestment, and United Equity) accepting investments on day t.
Competing Investments:	The total number of investments made on day t across all campaigns ran on three major and one minor German equity crowdfunding portal (Seedmatch, Companisto, Innvestment, and United Equity) that were not attracted by campaign i.
Equity Share:	Is the amount of capital requested by the venture (funding goal) over its pre-money valuation.
Seedmatch:	Dummy variable equal to 1 if the campaign was run on Seedmatch, and 0 if it was run on Companisto.
Update:	The number of updates posted on the portal website by the entrepreneur on day t in a particular campaign i.
Update Rank:	Is the ranking of a particular update during a campaign. The ranking was weighted in reverse order with the first Updates receiving higher weights. Because the campaign MyParfum on Companisto counted in total N = 14 updates, the first update received the weight 15 – 1 (=14), the second 15 – 2 (=13) ... and the last one 15 – 14 (=1).
Update Wordcount:	Is the total number of words that appeared in the update text.

<i>Update Dummies:</i>	
Team:	Dummy variable equal to 1 if the update contained information about the entrepreneurial team (education, previous work experience), and 0 otherwise.
Business Model:	Dummy variable equal to 1 if the update contained a description of the business model, the relevant market, or future business orientation, and 0 otherwise.
External Certification:	Dummy variable equal to 1 if the update contained an expert opinion, success stories, news about awards received, patent applications, patent approvals as well as press and media coverages about the start-up, and 0 otherwise.
Product Development:	Dummy variable equal to 1 if the update contained information about the product, target customers, prototypes, or new product inventions, and 0 otherwise.
Cooperation Projects:	Dummy variable equal to 1 if the update contained

information about new collaborations the start-up engaged in, and 0 otherwise.

Campaign Development: Dummy variable equal to 1 if the update contained information about campaign updates (number of crowd investors, achieved funding amount) or announcements that the funding limit has been changed, and 0 otherwise.

New Funding: Dummy variable equal to 1 if the update contained information of whether the start-up received additional funding from business angels, venture capitalists or government grants, and 0 otherwise.

Business Development: Dummy variable equal to 1 if the update contained information about the financial development of the start-up and its customer base (e.g., number of customers, new customers), and 0 otherwise.

Promotions: Dummy variable equal to 1 if the update contained information about promotions the crowd may receive (discounts, perks), open calls to participate via social media, invitations for personal meetings (open house events) and appeals to investors to support the start-up (marketing, recommendations, network), and 0 otherwise.
