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Abstract

In crowdfunding, start-ups can voluntarily communicate with their investors by posting updates. We investigate whether start-ups strategically use updates, which were previously shown to increase investments. To this end, we use hand-collected data of 751 updates and 39,036 investment decisions from the two major German equity crowdfunding portals Seedmatch and Companisto. We find evidence for strategic communication behavior of start-ups during an equity crowdfunding campaign. During the funding period, start-ups post updates with linguistic devices that enhance the group identity and the group cohesion. Furthermore, the probability of an update during the funding period increases with a strong competition of other contemporary crowdfunding campaigns.

Keywords:
Crowdfunding, Investor Communication, Entrepreneurial Finance, Sentiment Analysis, Linguistic Devices

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1. Introduction

In recent years, equity crowdfunding has gained increasing importance in providing start-ups with early-stage funding. In this article, we analyze the communication behavior of start-ups in equity crowdfunding during and after the funding period. Academic research in equity crowdfunding mainly focuses on the success factors of equity crowdfunding. While a more recent literature analyzes follow-up fundings, crowd exits and insolvencies of successfully funded equity crowdfunding campaigns (Hornuf and Schmitt, 2016; Signori and Vismara, 2016), most of the research investigates determinants of the funding success of a campaign. It has been shown that the size and education of the management team as well as particular project characteristics—e.g. the share of equity offered or disclosure of financial projections—are associated with successful campaigns (Ahlers et al., 2015; Bernstein et al., 2017; Vismara, 2016). Furthermore, the posting of voluntary information in the form of updates during the campaign increases the likelihood of success (Block et al., 2017; Mollick, 2014).

In the corporate finance literature scholars have analyzed the need for and the effects of voluntary disclosure. Generally, disclosure can reduce information asymmetries between the shareholders and the managers of a company. In this way, the publication of additional information can help to decrease potential agency costs. Theoretical models and empirical evidence both show that voluntary disclosure can lead to reduced costs of capital and hence to a higher market value of a company (see for example Diamond and Verrecchia, 1991; Healy and Palepu, 2001; Merton, 1987).

The crowdfunding as well as the disclosure literature both provide evidence for a positive impact of voluntary disclosure on the funding success or the company value, respectively. Yet, Block et al. (2017) find that the effect of updates on the success of equity crowdfunding campaigns depends on the content of the published information. Not all updates have a positive impact on the invested amount and the number of investments. In our paper we investigate whether start-ups take into account this relationship and strategically use updates with a specific content. Furthermore, we investigate the sentiment and the language used in updates. To this end, we first analyze changes in the communication behavior during and after the funding period. Second, we focus on the funding period only and investigate what induces start-ups to post an update.

We use hand-collected data from the two major German equity crowdfunding portals Seedmatch and Companisto to investigate the communication behavior of start-ups. Analyzing the language and the content of 751 up-

dates as well as 39,036 individual investment decisions we find evidence that start-ups strategically use updates during the funding period. The frequency of updates is significantly higher over the course of the funding period than afterwards and start-ups use more linguistic devices that create a feeling of group cohesion. During the funding period the probability of an update increases with the number of other contemporary equity crowdfunding campaigns.

Our study thus contributes to answering the question whether start-ups rationally use investor communication in a way to ensure successful funding and whether they potentially tend to overdo strategic communication. While the answer to the first question could help to improve the entrepreneurial behavior in crowdfunding campaigns, the latter aspect may be important in the context of investor protection. Both issues are relevant for the further development of the regulatory framework for equity crowdfunding.

The remainder of the paper is structured as follows. In Section 2 we describe the hypotheses regarding changes in the communication behavior of start-ups and the determinants of updates during the funding period. Section 3 provides an overview of the data set and the key variables. Section 4 presents descriptive statistics and analyzes the use of updates in equity crowdfunding. Section 5 concludes.

2. Theoretical foundation and hypotheses

In crowdfunding, updates are a form of voluntary disclosure for start-ups. Generally, the managers of a company are assumed to have comparatively better knowledge of the firm value and the expected future performance of the company than investors. These information asymmetries between managers and shareholders can be reduced by providing additional information through voluntary disclosure. Lower information asymmetries, in turn, can reduce the cost of capital for companies (Diamond and Verrecchia, 1991; Healy and Palepu, 2001; Merton, 1987). Rational entrepreneurs can therefore be expected to publish updates during the funding period of a campaign.

After the funding period, communication with investors is rational as well. Business models based on the joint using and the sharing of access to products and services are commonly referred to as the *Sharing Economy*. Crowdfunding is only one facet of this new phenomena (Puschmann and Alt, 2016). Reasons to participate in the sharing economy are diverse. Hamari et al. (2016) describe internal motivations such as perceived sustainability and enjoyment as well as external motivations such as reputation and economic benefits. Monetary motives, therefore, might not be the only reason

neither for entrepreneurs nor for investors to engage in equity crowdfunding. In particular in crowdfunding, the support and feedback of the crowd in developing as well as promoting products and services can be important for the future success of the start-up. If these non-monetary incentives play a role for investors and the start-up, we expect the entrepreneur to communicate with the investors both during and after the campaign. As the business development of the start-up is not per se different at any specific time during or after the funding period, the disclosable hard information should not significantly change between the funding period and afterwards.

However, previous research shows, that updates are important for the funding success of a crowdfunding campaign (Xu et al., 2014; Kuppuswamy and Bayus, 2017; Block et al., 2017; Hornuf and Schwienbacher, 2015; Mollick, 2014). Hornuf and Schwienbacher (2015) point out that following an update investments increase by 17.8% the next day. Furthermore, Block et al. (2017) find a positive effect of updates on both the number of investments and the invested amount. Moreover, they conclude that particular updates signal the quality of the start-up to investors. In crowdfunding, no regulations exist concerning the form or the content of voluntary disclosure, and usually no third party verifies the published information. Therefore, entrepreneurs can easily make use of this signaling effect and strategically post updates with specific content or language during the funding period to gain investments. We examine the communication behavior of start-ups and investigate whether entrepreneurs use active communication strategies during the funding period of a campaign. In the following, we derive several hypotheses regarding such a strategic communication behavior of start-ups.

The financial disclosure literature indicates that an optimistic and positive tone of the reports is associated with a better firm performance (Li, 2010; Davis et al., 2012; Henry, 2008). For example, Henry (2008) investigates the effect of the language used in earnings press releases on the stock price. He shows that press releases written in a positive tone are associated with higher abnormal returns. The results remain stable even after controlling for the financial results of the company. Positivity is also closely linked to the concept of passion in the entrepreneurship literature. Empirical evidence suggests that optimism, passion, and self-confidence of an entrepreneur increase the likelihood of receiving venture capital and indirectly raise the prospects of future growth (Baum and Locke, 2004; Cardon et al., 2009; Chen et al., 2009). Start-ups might use updates with a more positive tone during the funding period to show that they are passionate and optimistic.

Hypothesis 1: During the funding period updates have a more positive tone than after the funding period.

Furthermore, Allison et al. (2013) use the warm-glow theory of Andreoni (1990) to explain funding success on Kiva, a crowdfunding platform for micro loans. The warm-glow theory suggests that individuals receive utility by helping others. Examining the credit applications of micro loans, Allison et al. (2013) show that credit applications containing linguistic devices that evoke warm-glow effects receive a faster funding. Gerber and Hui (2013) find similar motives for other forms of crowdfunding. They point out that investors are motivated by the desire to help others and to be part of a community. By publishing updates with specific linguistic devices that evoke a feeling of cohesion start-ups may try to use this coherence. Using emotional language and the first person plural can create a feeling of group identity and improve the group cohesion (Zheng, 2000; Sexton and Helmreich, 2000; Tausczik and Pennebaker, 2010). Furthermore, using past tense can create a psychological distance (Tausczik and Pennebaker, 2010) and therefore, we expect start-ups to strategically use more first person plural, more emotional language, and more present tense in updates during the funding period.

Hypothesis 2: During the funding period updates contain more linguistic devices that evoke a feeling of group cohesion than after the funding period.

Xu et al. (2014) and Block et al. (2017) further investigate the content of the updates and their effect on the campaign progress. Both find a positive effect of updates on the funding success. However, they show that the effect of updates differs with the information disclosed. In equity crowdfunding, Block et al. (2017) highlight that while updates about new funding, the business development, and updates informing about cooperations of the start-up increase the funding success, updates informing about the entrepreneurial team, the business model, promotional campaigns and the product development are not significantly associated with an increase in investments. Bernstein et al. (2017) examine the effect of information disclosed in newsletters for the US equity crowdfunding platform AngelList. They find evidence that inexperienced investors respond to all information categories while experienced investors strongly respond to information about the entrepreneurial team. If entrepreneurs want to target the investment spirit, start-ups can be expected to publish more updates disclosing information that was previously shown to increase the funding success of the campaign during the funding period than afterwards.

Hypothesis 3: During the funding period entrepreneurs publish more updates with information on new funding, the business development, and updates informing about cooperations of the start-up.

On most of the equity crowdfunding platforms, start-ups define a funding goal before the campaign starts. The funding goal represents a threshold of the invested amount the start-ups need to achieve for a successful funding. Therefore, start-ups have a strong incentive to reach at least investments in the amount of the funding goal. Hornuf and Schwienbacher (2015) highlight the L-shape of investments under a first-come, first-served mechanism in equity crowdfunding, where significantly more investments take place in the beginning of the funding period. Vulkan et al. (2016) find that the chances for successful funding decrease after the beginning of the campaign. Hence, start-ups that are almost at the end of the funding period and attracted investments below the funding goal can be expected not to waste time to gain more backers. They might post updates to trigger the investments needed to reach the funding goal.

Hypothesis 4: Start-ups are more likely to post an update when the funding goal of the campaign is not reached and the remaining funding period is short.

During the funding period start-ups may also consider the competitive environment of their equity crowdfunding campaign. Many parallel equity crowdfunding campaigns or so-called *blockbuster*, popular campaigns with an extremely large number of backers, may steal investors away from the focal crowdfunding campaign. When competition is strong, start-ups may be more likely to post an update to draw attention to their own campaign. However, previous research indicates that blockbuster accelerate investments not only in the focal campaign but also increase investments in other crowdfunding campaigns (Kickstarter, 2012). This is because blockbusters usually enjoy extensive media coverage and new backers may be attracted to crowdfunding in general. With data from the reward-based crowdfunding portals Kickstarter and Indiegogo, Doshi (2016) shows that on average the invested volume increases in the blockbusters' project category. Depending on the project category blockbuster can also create spill-over effects to other project categories. Darrough and Stoughton (1990) analyze voluntary disclosure in competitive markets. They highlight that under some assumptions such as low entry costs to the market a strong competition favors voluntary disclosure

to deter entry of competitors. In the context of equity crowdfunding Hornuf and Schwienbacher (2015) and Block et al. (2017) find a positive relationship between a strong competition of campaigns and the funding success of a particular campaign. Overall, the probability to disclose voluntary information in the form of updates can be expected to increase in a highly competitive environment.

Hypothesis 5: Start-ups are more likely to post an update when the number of competing investments in contemporary equity crowdfunding campaigns is high.

3. Data

3.1. Data sources

For the empirical analysis we hand-collect data from the two German equity crowdfunding portals Seedmatch and Companisto during the period from June 7, 2012 to April 27, 2015. The portals Seedmatch and Companisto are the market leaders for equity crowdfunding in Germany and account for around 75% of the total crowdfunding capital raised in Germany during the observation period. We obtain all data directly from the platforms. Generally, start-ups do not only use the equity crowdfunding portals to post their updates but also publish the information in social media or newsletters. After the campaign, the equity crowdfunding portals keep a page for each campaign with a project overview as well as all key characteristics of the campaign and the possibility to post updates. As start-ups also seek to ensure the visibility of their updates after the end of the campaign, we expect the start-ups to still use all communication channels including the equity crowdfunding portals to post their updates. For the further analysis we use two different data sets.

To analyze changes in the communication behavior of start-ups we focus on the updates posted during or after the funding period and examine all campaigns run on Seedmatch and Companisto that include at least one update. In total, our first data set (update data set) includes 751 updates of 97 equity crowdfunding campaigns. With 64 campaigns the majority of the 97 campaigns were run on Seedmatch. Yet, start-ups running equity crowdfunding campaigns on Companisto appear to post more updates. Around 52% of the updates were posted on that portal. Several start-ups run multiple equity crowdfunding campaigns, hence, the 97 campaigns belong to

88 unique start-ups. Most of these start-ups operate in the information & communication or in the wholesale & retail sector.

Additionally, we obtained a second data set with daily investor data for 71 campaigns (investor data set) to further investigate the determinants of updates during the funding period. We were able to retrieve investor data for 26,456 investments of all 36 campaigns on Companisto. Seedmatch, however, removes all investment data from the website once the funding is completed. Therefore, we retrieved daily investment data for 12,580 investments and 35 campaigns on Seedmatch. Importantly, during the funding period only 57 campaigns include updates, which were hence also considered in the updates data set. We also obtain investor data for 14 campaigns that did not post a single update during the funding period. Overall 8 start-ups ran multiple equity crowdfunding campaigns; thus, the 71 campaigns belong to 63 unique start-ups. In a final step, as in Kuppuswamy and Bayus (2017) and Hornuf and Schwienbacher (2015) we construct a panel data set in which the time dimension is equal to the days of the campaign and the cross-sectional dimension represented by the campaigns. The investor data set contains 5,176 campaign days and 314 updates posted on these days.

3.2. Dependent variables and key explanatory variables

To test our hypotheses we define different dependent variables. For each day of the funding period, we identify whether the start-up posted an update or not (*Update*). Furthermore, we consider all updates posted during and after the funding period and examine the content and the language of these updates. We apply a coding process to examine the information contained in the updates. Following Block et al. (2017), we use nine categories to describe the content of the updates: *Team*, *BusinessModel*, *Certification*, *Product*, *Cooperation*, *Campaign*, *NewFunding*, *Business*, *Promotions* and *Emotional*. For example, *Campaign* considers information about the campaign development such as the number of investors or the amount already invested. Furthermore, we come up with an additional category, *Emotional*, which comprises information about the use of emotional language in the updates. A detailed description of all the categories is included in Table 1. The categories are not mutually exclusive, different categories can apply to one update.

To ensure the reliability of our coding scheme a second, independent researcher rated the updates. At first, we provide the second researcher a coding manual with a detailed description of each category and he rated around 20% of the updates. In a following discussion we adapt our coding

scheme and come up with the final description of the ten categories. Thereafter, both raters coded all updates again (Reis and Judd, 2014). To measure the inter-rater agreement we calculate the Cohen's Kappa coefficient (Cohen, 1960; Fleiss et al., 2003). Over all categories we have a Cohen's Kappa of 0.85. Depending on the category the inter-rater reliability ranges from 0.77 to 0.94 indicating excellent agreement[1] between the two raters (Landis and Koch, 1977).

[Table 1 about here]

To further evaluate the sentiment and the language of the updates we use the text analysis software Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2001; Wolf et al., 2008). LIWC counts the words in the updates and compares them with dictionaries of different linguistic and psychological categories (for example positive or negative emotions). The software calculates the percentage of total words for each category. Thus, we can measure the sentiment of the updates (*Positive* and *Negative*) and the usage of past tense (*Past*) as well as the usage of first person plural (*We*).

Generally, the start-ups have 60 days to gain enough investments to reach their funding goal (*funding period*) after the publication of the campaign on the crowdfunding platform. However, for each campaign the start-ups can extend the funding period once for another 60 days (Klöhn and Hornuf, 2012). To investigate changes in the communication behavior we derive the variable *FIN* indicating if an update is posted during the funding period or afterwards.

Using daily investment data, we define several key explanatory variables. We measure the success of a campaign with two different proxies. On the one hand, we create the dummy *Alarm*. *Alarm* accounts for the start-ups that urgently need more investments, in the sense that the amount already invested has not reached the funding goal yet and the remaining time of the funding period is short. We define the remaining time as short when three quarters of the funding time, and three quarters of the enlargement of the funding time have passed. On the other hand, we use the variable *Amount*, which indicates the amount of money invested in the campaign until a particular day of the campaign. Moreover, we measure the competitive environment of a campaign by summing up the number of all investments

[1] According to Landis and Koch (1977) a Cohen's Kappa between 0.61 and 0.8 indicate substantial agreement, values above 0.81 indicate almost perfect agreement.

made on a particular day over four relevant equity crowdfunding portals (*#Investments*).

We also include several further control variables based on prior research. Hornuf and Schwienbacher (2015) show that investments in equity crowdfunding decrease under a first-come, first-served mechanism once the funding goal is surpassed. Therefore, we include a dummy variable (*PostFunded*) that equals one once this threshold is reached. In another paper Hornuf and Neuenkirch (2017) demonstrate that a high stock market volatility is associated with higher premia for the equity crowdfunding portal Innovestment. The authors conclude that equity crowdfunding is a substitutional rather than a supplementary asset class when stock markets are volatile. Thus, we also include the German VDax (*VDAX*) as a control variable. To capture portal-specific effects we include a dummy variable for the equity crowdfunding portal Companisto (*Portal*). Finally, we control for the industry of the start-up, the year, and the day of the week (see for example Block et al. (2017); Hornuf and Neuenkirch (2017); Vismara (2016)). A description of all variables is presented in Table 1.

4. Results

4.1. Summary Statistics

Table 2 presents summary statistics of the main variables of interest for the updates data set. The majority of the 751 updates is published during the funding period. Yet, we also consider 299 updates that are posted afterwards. A bulk of the updates discloses information on promotions of the start-ups and / or describes the business model. By contrast, only few updates contain emotional language and disclose information about the entrepreneurial team or new fundings. Some start-ups extensively use updates to communicate with their investors. In total, the start-up *Riboxx* posted 29 updates since the campaign start in July, 2014. On average 33 days pass before a subsequent update is posted in a particular campaign. However, the length of this interval differs between the two portals. On Companisto on average 28 days pass between the posting of an update, on Seedmatch this interval is on average 39 days. The length of the updates varies considerably as well. The shortest update only consists of one word ("Danke", meaning: thanks) while the longest contains 1,293 words. Furthermore, the updates use a fairly positive tone. Around 3.9% of the words are positive, by contrast, only around 0.3% are negative.

Summary Statistics for the investor data set are shown in Table 3. More than 80% of the campaigns have at least one update during the funding

period. On average, a start-up posts 4 updates during that time. However, the number of updates differs between the campaigns. Some start-ups do not post a single update while others extensively use this tool for communication. For example, the start-up *MyParfume* posted 14 updates during the funding period. Yet, the campaign length of *MyParfume* is above the average of 73 days (123 days).

As soon as the campaign is active and backers have the possibility to invest, start-ups can communicate with their investors via updates. Most of the start-ups post their first update at the beginning of the funding period (see Figure 1). Several start-ups even post updates on the very first day of the campaign. These updates are usually not linked to the progress of the campaign. As described in Mollick (2014) start-ups may strategically post updates soon after the campaign start to show that they are well prepared for the campaign and thus indicate a high campaign quality.

[Figure 1 about here]

Most of the equity crowdfunding campaigns managed to reach their funding goal quickly. Yet, 6 campaigns did not achieve the funding goal before three quarters of the funding period were over. A number of 47 investments were made on an average campaign day. By comparison, 7.56 investments were on average made each day in a particular campaign.

[Tables 2 and 3 about here]

4.2. Univariate Analysis: Changes in communication behavior after the funding period

To investigate modifications in the communication behavior during and after the funding period we apply an univariate analysis. As we observe several updates per campaign we have to consider the correlation between updates of the same campaign. For the continuous dependent variables we use a Feasible Generalized Least Squares (FGLS) model. According to Cameron and Miller (2015) a FGLS model can lead to efficiency gains compared to OLS when accounting for dependencies within groups. We perform a modified Hausman Test and in case the Hausman Test leads us to dismiss the random effects model we apply fixed effects, otherwise we stick with random effects. For binary dependent variables (i.e. the update categories) we use a probit regression with standard errors clustered at campaign level. Table 4 and 5 present the results.

We find that the frequency of updates differs significantly between the funding period and afterwards. During the funding period on average 56

days less go by than after the funding period until a subsequent update is published. This result indicates that obtaining funding for many start-ups indeed is the premier goal of an equity crowdfunding campaign. Yet, since entrepreneurs keep communicating with investors after the successful funding non-monetary motivations play a role in equity crowdfunding as well.

The sentiment of the updates is not significantly different between the funding period and afterwards. The updates neither contain less positive nor more negative words once the funding is completed. Hence, we find no evidence for our first hypotheses that start-ups use a positive tone in updates during the funding period to encourage investors. However, the results suggest that start-ups use other devices than the sentiment of the update to reach out to the crowd. We observe a significant positive relationship between the funding period and updates that use emotional language (*Emotional*). Furthermore, the updates during the funding period contain significantly more first person plural and less past tense than updates after the funding period. Yet, this relationship may exist due to the fact that most start-ups run equity crowdfunding campaigns to obtain seed finance. Many of these start-ups have started the business recently and may not have had past events to report about in the equity crowdfunding campaign. Overall, the results support our second hypothesis that updates contain more linguistic devices during the funding period evoking a feeling of group cohesion and improving group identity than updates posted afterwards.

We also investigate whether the usage of updates with a specific content differs between the funding period and afterwards. Two update categories, namely *Business* and *Campaign* have a significant positive relationship with *FIN*. Block et al. (2017) highlight that updates informing about the business development increase investments while updates about the campaign do not have a significant effect on the success of a campaign. Hence, the fact that significantly more updates containing information about the business development are published during the funding period represents evidence in favor of our third hypothesis that entrepreneurs strategically use updates, which were shown to increase investments. The positive relationship between *FIN* and *Campaign* is not surprising, either. This effect is driven by the fact that start-ups post more information about the campaign progress such as the achieved funding amount or the number of backers on a particular date during the funding period than after the successful funding. The two other categories that were shown to increase investments by Block et al. (2017), *NewFunding* and *Cooperation* are not significantly associated with *FIN* in our analysis. We also find that start-ups post significantly less updates about external certification and promotions during the funding period than

afterwards. In many cases the start-ups have not fully developed the product at the time of the equity crowdfunding campaign. Therefore, many start-ups are not able to post updates about external certification during the funding period. Overall, we only find weak evidence for our third hypothesis and therefore, we cannot confirm that start-ups strategically change the content of updates during the funding period and afterwards.

Block et al. (2017) point out that the length of the update text is not significantly associated with investments. In line with this result, we do not find evidence that updates during the funding period contain more words than updates afterwards.

[Tables 4 and 5 about here]

4.3. Multivariate Analysis: Communication dynamics during the funding period

To analyze the determinants of posting an update on a given day during the funding period of a campaign, we estimate several statistical models. Our dependent variables are binary and equal to one if an update or an update of a specific category is posted on a particular campaign day and zero otherwise. We start with panel models and apply a Hausman Test. We have to dismiss the random-effects model as being inconsistent for our data. Yet, the fixed-effects logit model only uses variation within the campaign and therefore implies heavy losses of observations depending on the update category. Furthermore, coefficients for time-invariant regressors cannot be estimated. Thus, we use a pooled probit regression as main model and include the fixed-effects model as robustness check. Table 6 presents the results for the pooled probit with 'posting of an update' and 'posting of an update with a specific content' as dependent variables, respectively.

We find different effects with respect to the *Alarm* dummy for the update categories. While we observe a significant positive relationship between the *Alarm* dummy and emotional updates as well as those disclosing information about the business and campaign development, all other categories are insignificant. We cannot estimate average marginal effects for updates about new funding sources and the entrepreneurial team as these updates are never posted when the *Alarm* dummy equals one. The probability of an update increases for the significant categories, *Campaign*, *Business*, and *Emotional*, by between 1.7% and 2.8% in case the *Alarm* dummy equals one. On the one hand, the significant positive effect of the *Alarm* dummy on emotional updates and those disclosing information on the business development suggest a strategic communication behavior of start-ups. On

the other hand, *NewFunding* and *Cooperation*, the two other categories that increase investments according to Block et al. (2017) are not significant in our data. Thus, we only find weak evidence for our forth hypothesis that start-ups are more likely to post an update when the funding goal is not reached and the remaining funding period is short.

Moreover, we observe a significant positive relationship between the total number of investments in equity crowdfunding campaigns on the overall market during the previous day and the probability of an update in the focal campaign. An increase of the total investments by 1,000 is associated with an 11.47% increase in the probability of an update. In times of a highly competitive environment, start-ups thus try to draw attention to their campaign by posting updates and thereby attract backers. This relationship also holds for most of the update categories. Updates of the categories *Team*, *BusinessModel*, *Product*, *Cooperation*, *Promotions* and *Emotional* are significantly positively associated with the total number of investments on the market. Overall, the results therefore support our fifth hypothesis that the likelihood of an update increases with market competition.

Our second proxy for the campaign success, the amount invested until the previous day, is not significantly related with the probability of an update. With respect to the other control variables we observe a significant relationship between the probability of an update and the reaching the funding goal (*PostFunded*) as well as the *VDAX* for some categories. The portal on which the equity crowdfunding campaign is run plays a role for some of the update categories, as well. The sign, however, differs between the categories under consideration. While significantly more updates about the entrepreneurial team and collaborations of the start-up are posted on Companisto, significantly less updates disclose information about the campaign development.

The results of the fixed-effects logit regression are presented in Table 9. They show a significant positive relationship between the probability of an update of the *Business* category and the *Alarm* dummy. Furthermore, we can confirm the previous results regarding the significant positive impact of competing investments on updates in general and on those disclosing information about *Team*, *Product*, *Cooperation*, *Business*, *Promotions* and *Emotional* in particular.

[Table 6 about here]

As an alternative model we perform a Cox proportional hazard model with the number of days before the update is posted as dependent variable.

Using this model we are able to analyze the time that passes before an update (or an update with a particular content) is published considering various covariates. As we have so-called multiple-failure data, i.e. each campaign can exhibit more than one update, we cluster the standard errors at campaign level. The results are shown in Table 7. In this analysis we report hazard ratios, which can be interpreted as semi-elasticity or multiplicative effect.

[Table 7 about here]

The results are similar to the ones of the pooled-probit model. We can confirm the positive relationship between updates disclosing information about the business development as well as emotional updates and the *Alarm* dummy. Furthermore, we find a positive relationship between the total number of investments and the probability of an update being posted for most of the update categories. We test the proportionality assumption of the Cox model for all explanatory variables. In case the assumption is violated, we include an interaction term of the explanatory variable with time (t). The interaction term $\#Investments{\cdot}t$ indicates that the effect of competition of contemporary equity crowdfunding campaigns is not constant but decreasing over time for updates in general and those updates disclosing information about the entrepreneurial team, the business model, the product, the business development, and emotional updates.

Using the Cox proportional hazard model our second proxy for campaign success, *Amount*, is significantly negatively associated with the probability of an update. Start-ups with a lower amount of funding have a higher probability of the founder posting an update. This result provides further evidence for a strategic communication behavior of start-ups. Again, the interaction term between *Amount* and the time suggests a decreasing effect of *Amount* on the probability of an update over time.

Colombo et al. (2015), Kuppuswamy and Bayus (2017), and Vulkan et al. (2016) point out that collective attention at the beginning of the campaign is crucial: crowdfunding campaigns that attract investors in the early phase of the funding period are significantly more successful. Our descriptive analysis of the data has also shown that start-ups tend to post updates soon after the campaign start. To analyze the communication behavior of the first part of the funding period in more detail, we analyze the duration before the first update is posted. As main model we use a Cox proportional hazard model. An advantage of the survival analysis in this context is that we deal with right censoring. We do not only consider the campaigns with a first update but also those campaigns that did not post an update during the funding

period. The results are presented in column 1 and 3 of Table 8. Furthermore, we apply a negative binomial model to investigate the number of days before the first update is published. Columns 2 and 4 in Table 8 show the results for the negative binomial estimations.

The updates posted on the very first day of a campaign are usually not linked to the progress of the campaign. Hence, we use two different subsamples: one in which we do not include updates posted on the first day (model 1 and 2) and one in which we do include these updates (model 3 and 4).

In the first two models we do not only consider explanatory variables that are determined before the campaign start but also two variables indicating the campaign success and the competitive environment on the first campaign day. However, the results suggest that neither the number of competing investments on the first day nor the share of the funding goal reached on the first day are significantly associated with the time until the update is posted. That would indicate that the competitive environment and the success of a campaign are less important for posting of the first update. In models 1 and 2 we further include a dummy variable indicating whether an update was posted on the first campaign day or not. Interestingly, using the Cox proportional hazard model we find that start-ups posting an update on the first day of a campaign have a significantly shorter time to the subsequent update. Hence, start-ups starting to communicate with the investors early on appear to communicate more frequently later as well.

Considering updates posted on the first campaign day too (model 3 and 4), we find that the portal is significantly associated with the time before the first update is posted. In particular, for campaigns run on the platform Companisto the time before the first update is published is significantly shorter.

[Table 8 about here]

5. Conclusion

The entrepreneurship literature has extensively analyzed the interactions between venture capitalists or angel investors and entrepreneurs as well as the strategic behavior of each party (for example Sahlman, 1990; Schwienbacher, 2007; Mohamed and Schwienbacher, 2016). So far, little is known about the strategic behavior of entrepreneurs in crowdfunding. In this paper, we investigate the communication behavior of start-ups during and after an equity crowdfunding campaign. Investigating the communication behavior

in equity crowdfunding is important because unlike venture capitalists the crowd does not obtain information from an insider at the board of directors and does not receive news through contractual obligations such as specific covenants.

Using a novel dataset of German equity crowdfunding campaigns, we find that entrepreneurs use active communication strategies regarding the content and language of updates as well as the timing of publishing voluntary information. Start-ups post updates with a higher frequency during the funding period than afterwards and use a language that evokes warm-glow effects among potential investors and a feeling of group cohesion. Focusing on the funding period, we provide evidence that entrepreneurs strategically post updates when the required amount for a successful funding is not yet reached and the remaining funding period is short. Furthermore, the probability of an update increases with stronger competition from parallel equity crowdfunding campaigns. In sum, our results indicate that entrepreneurs act strategically and use investor communication during the funding period. Given that equity crowdfunding often falls outside traditional securities regulation and in particular outside the securities prospectus regime, securities regulators and portal owners should be wary about the content start-ups post during an equity crowdfunding campaign.

For investors who primarily seek to maximize their return and who are not attracted by the motives of the sharing economy, this communication behavior may lead to sub-optimal investment decisions. This may be due to the possibly blurred informational content of some updates that may be targeted at receiving funds and not accurately reveal information. Whether a specific communication behavior of start-ups indeed leads to lower returns for investors should be investigated once the respective data becomes available. This is particularly relevant, given that little is know about the truthfulness of the information communicated by the start-ups. If start-ups are systematically and strategically posting fraudulent updates to increase investments, regulators have to consider enhancing investor protection in the context of equity crowdfunding. Future research might further focus on the learning process of entrepreneurs. Entrepreneurs with experience from multiple crowdfunding campaigns might apply a more sophisticated communication strategy than first-timers. Furthermore, the effects of mandatory disclosure in equity crowdfunding can be of interest. In the context of venture capital Cumming and Knill (2012) find evidence for a positive effect of strict disclosure requirements on both the supply and the performance of venture capital.

Finally, our paper has also clear limitations. With 97 campaigns (update

dataset) and 71 campaigns (investor dataset) our samples does barely allow to conduct extensive sub-sample analyses for different industries, portals or founder teams. For example, larger founder teams might have better capacities and could be more creative to strategically post updates. At the same time, they might also provide better checks and balances when it comes to the content of information disclosure.

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Tables and Appendix

Table 1: List and Definition of all Variables.
The data is retrieved from the German equity crowdfunding portals Seedmatch and Companisto.

Variable	Description
Update	Dummy variable equal to 1 if the start-up publishes an update on day t, and 0 otherwise.
Team	Dummy variable equal to 1 if the update on day t discloses information about the entrepreneurial team (e.g. work experience, age, education), and 0 otherwise.
BusinessModel	Dummy variable equal to 1 if the update on day t discloses information about the business model, the relevant market or future plans and strategies, and 0 otherwise.
Certification	Dummy variable equal to 1 if the update on day t discloses information on external certification of the company or the product (e.g. press coverings, awards, patents), and 0 otherwise.
Product	Dummy variable equal to 1 if the update on day t discloses information on the product or the product development, and 0 otherwise.
Cooperation	Dummy variable equal to 1 if the update on day t discloses information on cooperation projects or collaborations of the start-up, and 0 otherwise.
Campaign	Dummy variable equal to 1 if the update on day t discloses information on the funding of the campaign (e.g. number of investors, archived funding amount, change of funding limit), and 0 otherwise.
NewFunding	Dummy variable equal to 1 if the update on day t discloses information on additional funding sources of the start-up such as business angels, venture capitals or government grants, and 0 otherwise.
Business	Dummy variable equal to 1 if the update on day t discloses information about the customers or financials (e.g. number of customers, amount of sales), and 0 otherwise.
Promotions	Dummy variable equal to 1 if the update on day t discloses information about promotions for the crowd (discounts, rewards), invites the crowd to participate on events or appeals to the crowd to support the start-up (e.g. recommendations, network), and 0 otherwise.
Emotional	Dummy variable equal to 1 if the update on day t contains emotional language, and 0 otherwise.
FIN	Dummy variable equal to 1 if the update is published during the funding period, and 0 otherwise.
Positive	Percentage of words that evoke positive emotions within the update text (e.g. love, nice, sweet). Obtained by the software LIWC.
Negative	Percentage of words that evoke negative emotions within the update text (e.g. hurt, ugly, nasty). Obtained by the software LIWC.
Interval	Time interval between the publications of updates in a particular campaign, in days.
WC	The total number of words that appear in the update text.
We	Percentage of words that refer to first person plural within the update text (e.g. we, us, our). Obtained by the software LIWC.

Table 1 continued.

Variable	Description
Past	Percentage of words that refer to the past within update text (e.g. went, had, ran). Obtained by the software LIWC.
Amount	Total amount of money invested by the crowd until day t in a particular campaign, in Euro.
FundingGoal	The minimum funding goal as defined by the start-up and the portal on day 0, in Euro.
%Invested	*Amount* over funding goal at day t in a particular campaign.
Alarm	Dummy variable equal to 1 if the funding goal is not reached and more than three quarters of the funding period has passed, and 0 otherwise.
#Investments	Total number of all investments made on day t across all campaigns on three major and one minor German equity crowdfunding portal (Companisto, Seedmatch, Innovestment, and United Equity).
VDAX	Volatility index on the German stock index DAX on day t. Source: Datastream.
PostFunded	Dummy variable equal to 1 if the invested amount of the campaign has exceeded the funding goal on day t in a particular campaign, and 0 otherwise.
Portal	Dummy variable equal to 1 if the campaign is run on the portal Companisto, and 0 otherwise.
EquityShare	Funding Goal over pre-money valuation.
Time	Total number of days passed from the start of the campaign before publishing the first update. Either updates on the first campaign day are considered (subsample 2) or not (subsample 1).
Update1Day	Dummy variable equal to 1 if an update is published on the first day of the campaign, and 0 otherwise.
Industry	Dummy variables for the industry the start-up is operating in, either information & communication; wholesale & retail; manufacturing; professional, scientific & technical activities; financial & insurance activities or accommodation & food service activities.

Figure 1: Time to first Update
Number of days until the first update is published. Investor Data Set.

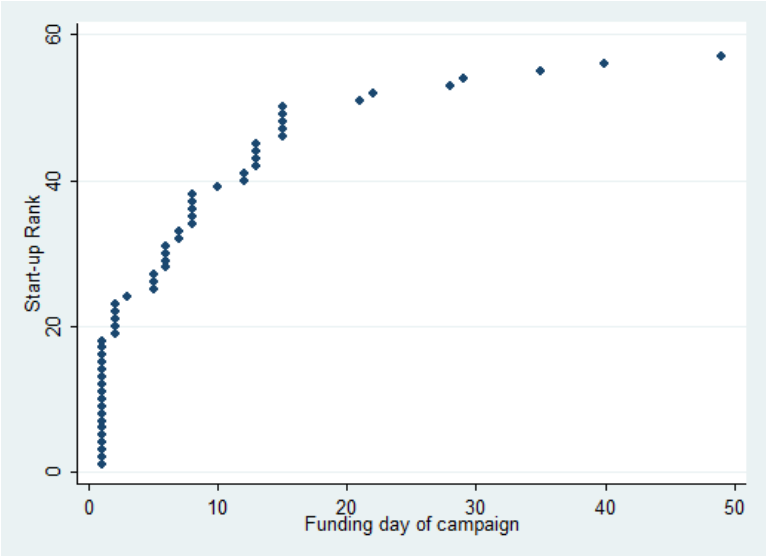

Table 2: Summary Statistics Updates Data Set.
97 campaigns. All variables are defined in Table 1. Corr denotes the pairwise Bravais-Pearson Correlation Coefficients with *FIN*.

UPDATES DATA SET							
Binary Variables	Yes	Mean	Median	SD	# Obs.	Corr	
FIN	452	0.602	1	0.4898	751		
Team	87	0.116	0	0.3203	751	−0.0201	
BusinessModel	345	0.155	0	0.3629	751	0.0292	
Certification	283	0.376	0	0.4849	751	−0.1141	
Product	292	0.388	0	0.4878	751	0.4878	
Cooperation	170	0.226	0	0.4187	751	0.0174	
Campaign	143	0.190	0	0.3928	751	0.2420	
NewFunding	51	0.067	0	0.2517	751	0.0574	
Business	184	0.245	0	0.4303	751	0.1597	
Promotions	347	0.462	0	0.4988	751	−0.1247	
Emotional	117	0.156	0	0.3629	751	0.1019	
Metric Variables	Mean	Median	SD	Min.	Max.	# Obs.	Corr
Interval	32.882	16	67.8472	0.00	662.00	650	−0.3532
WC	256.163	222	176.9025	1.00	1,293.00	751	−0.0272
Positive (in %)	3.981	3.54	4.0948	0.00	100.00	751	0.0094
Negative (in %)	0.262	0	0.4700	0.00	4.26	751	−0.0153
We (in %)	3.988	3.87	2.4807	0.00	26.67	751	0.0643
Past (in %)	1.524	1.34	1.2019	0.00	8.00	751	−0.0910

Table 3: Summary Statistics Investor Data Set.
71 campaigns. All variables are defined in Table 1. Corr denotes the pairwise Bravais-Pearson Correlation Coefficients with *Update* and *Time*, respectively.

INVESTOR DATA SET							
Binary Variables	Yes	Mean	Median	SD	# Obs.		
Update	314	0.061	0	0.2387	5,176		
Team	45	0.009	0	0.0928	5,176		
BusinessModel	156	0.030	0	0.1709	5,176		
Certification	106	0.020	0	0.1416	5,176		
Product	136	0.026	0	0.1599	5,167		
Cooperation	82	0.015	0	0.1248	5,176		
Campaign	83	0.016	0	0.1256	5,176		
NewFunding	23	0.004	0	0.0665	5,176		
Business	94	0.018	0	0.1335	5,176		
Promotions	146	0.028	0	0.1655	5,176		
Emotional	62	0.012	0	0.1088	5,176		
Metric Variables	Mean	Median	SD	Min.	Max.	# Obs.	Corr
Alarm	0.02	0	0.1349	0	1	5,176	−0.0049
#Investments	47	30	72.1444	0	1160	5,176	0.0586
Amount	497,352	141,500	1,254,637	1,260	7,497,250	5,176	−0.0557
FundingGoal	112,459	50,000	211,229	25,000	1,000,000	5,176	−0.0643
VDAX	18.20	17.63	3.2100	12.70	32.08	5,176	−0.0120
Portal	0.55	1	0.4977	0	1	5,176	0.0272
PostFunded	0.86	1	0.3489	0	1	5,176	0.0059
EquityShare	0.02	0.02	0.0246	0.0045	0.23	5,176	0.0040
%Invested	4.51	2.99	4.1910	0.0075	20	5,176	−0.0010
%Invested1Day	1.5876	0.7987	2.3098	0.0075	14.9975	71	−0.1948
Update1Day	0.2535	0	0.4381	0	1	71	−0.3133

Table 4: Regression Results Funding Period, FGLS-Estimation.
This table reports upon regression results using the Updates Data Set and random-effects model (dependent variables: *Positive*, *Negative*, *Interval*, *WC*) and fixed-effects model (dependent variables: *We*, *Past*). Heteroskedasticity-robust standard errors are shown in parentheses. For regression models with random-effects the overall-R^2 and for those with fixed-effects the Within-R^2 are shown. ** and *** denote significance at a 5%- and 1%-level.

	Positive	*Negative*	*We*	*Past*	*Interval*	*WC*
FIN	0.0784	−0.0635	0.8012***	−0.3879**	−55.8470***	−5.7234
	(0.3662)	(0.0535)	(0.2519)	(0.1518)	(8.7571)	(14.6006)
Constant	3.9339***	0.3250***	3.5056***	1.7572***	75.8570***	250.3666***
	(0.2440)	(0.0552)	(0.1516)	(0.0913)	(9.7145)	(15.2357)
# Obs.	751	751	751	751	650	751
R^2	0.0001	0.0002	0.0187	0.0163	0.1248	0.0007

Table 5: Marginal Effects Funding Period, Probit-Estimation.
This table reports upon average marginal effects using the Updates Data Set and probit regressions. Cluster- and heteroskedasticity-robust standard errors are shown in parentheses. *, ** and *** denote significance at a 10%-, 5%- and 1%-level.

	Team	*BusinessModel*	*Certification*	*Product*	*Cooperation*
FIN	−0.0130	0.0298	−0.1112**	0.0237	0.0150
	(0.0295)	(0.0442)	(0.0565)	(0.0480)	(0.0421)
# Obs.	751	751	751	751	751
$Pseudo - R^2$	0.0006	0.0006	0.0098	0.0004	0.0003

	Campaign	*NewFunding*	*Business*	*Promotions*	*Emotional*
FIN	0.2105***	0.0307	0.1442***	−0.1256**	0.0782**
	(0.0341)	(0.0233)	(0.0484)	(0.0520)	(0.0342)
# Obs.	751	751	751	751	751
$Pseudo - R^2$	0.0668	0.0069	0.0238	0.0113	0.0124

Table 6: Probability of Updates, Pooled Probit Estimation.
This table reports upon average marginal effects of the pooled probit regression using the investor data set. The natural logarithm of *Amount* is used and *#Investments* is displayed in 1,000. Cluster- and heteroskedasticity-robust standard errors are shown in parentheses. *, ** and *** denote significance at a 10%-, 5%- and 1%-level, respectively.

	Update	*Team*	*BusinessModel*	*Certification*	*Product*	*Cooperation*	*Campaign*	*NewFunding*	*Business*	*Promotions*	*Emotional*
Alarm	0.0160		0.0207	0.0096	−0.0168	0.0065	0.0166*		0.0280***	0.0151	0.0275*
	(0.0220)		(0.0190)	(0.0169)	(0.0143)	(0.0060)	(0.0100)		(0.0075)	(0.0132)	(0.0149)
$\#Investments_{t-1}$	0.1147***	0.0285***	0.0378*	−0.0020	0.0534***	0.0320**	0.0219	0.0092	0.0271	0.0663***	0.0306**
	(0.0335)	(0.0094)	(0.0227)	(0.0268)	(0.0186)	(0.0141)	(0.0151)	(0.0059)	(0.0197)	(0.0221)	(0.0125)
$\ln Amount_{t-1}$	−0.0011	−0.0020	−0.0016	0.0003	−0.0001	−0.0000	0.0010	−0.0001	0.0009	−0.0007	−0.0006
	(0.0032)	(0.0017)	(0.0018)	(0.0018)	(0.0022)	(0.0014)	(0.0018)	(0.0005)	(0.0015)	(0.0028)	(0.0013)
VDAX	0.0009	−0.0006	−0.0013	0.0002	0.0003	−0.0001	0.0007	−0.0004	−0.0001	0.0001	−0.0004
	(0.0012)	(0.0005)	(0.0011)	(0.0008)	(0.0008)	(0.0010)	(0.0006)	(0.0003)	(0.0007)	(0.0008)	(0.0007)
PostFunded	−0.0017	−0.0103**	−0.0054	0.0180**	−0.0036	−0.0120***	0.0093	0.0012	0.0005	0.0031	0.0220**
	(0.0094)	(0.0049)	(0.0071)	(0.0090)	(0.0071)	(0.0046)	(0.0059)	(0.0032)	(0.0068)	(0.0074)	(0.0098)
Portal	0.0041	0.0168***	0.0072	0.0072	−0.0023	0.0161***	−0.0148***	−0.0005	0.0036	0.0024	−0.0055
	(0.0121)	(0.0055)	(0.0075)	(0.0064)	(0.0069)	(0.0062)	(0.0050)	(0.0023)	(0.0055)	(0.0066)	(0.0051)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	5,174	5,174	5,174	5,174	5,174	5,174	5,174	5,174	5,174	5,174	5,174
$Pseudo - R^2$	0.0597	0.1362	0.0527	0.0673	0.0618	0.0834	0.0678	0.0769	0.0346	0.0757	0.1013

Table 7: Probability of Updates, Cox Proportional Hazard Model.
The table reports upon hazard rates of the Cox Proportional Hazard Model using the investor data set. Dependent variable is the duration to an update (or update category) in days. ln*Amount*·*t* and #*Investments*·*t* are interaction terms between the explanatory variables ln*Amount* and #*Investments* and the time passed. The natural logarithm of *Amount* is used and #*Investments* is denoted in 100. Cluster-robust standard errors are shown in parentheses. *, ** and *** denote significance at a 10%-, 5%- and 1%-level.

	Update	*Team*	*BusinessModel*	*Certification*	*Product*	*Cooperation*	*Campaign*	*NewFunding*	*Business*	*Promotions*	*Emotional*
Alarm	0.7371		1.4153	1.0272	0.3588	0.6588	1.6056		2.4031*	1.0877	9.9387*
	(0.1773)		(0.6158)	(1.0164)	(0.2407)	(0.4654)	(0.7668)		(1.1077)	(0.4623)	(12.4366)
#*Investments*	1.5872***	2.4810***	1.8896***	1.0648	1.9002***	1.1273	1.1086	1.3210	2.1069***	0.9903	1.7229***
	(0.1703)	(0.4206)	(0.1965)	(0.2222)	(0.1979)	(0.2592)	(0.2548)	(0.3412)	(0.2833)	(0.1664)	(0.2084)
#*Investments*·*t*	0.9975***	0.9965***	0.9976***		0.9967***				0.9968***		0.9958***
	(0.0005)	(0.0010)	(0.0006)		(0.0008)				(0.0009)		(0.0012)
ln*Amount*	0.6112*	0.1543***	0.3343***	0.2029***	0.2794***	0.2269***	0.7969	0.2829	0.2522***	0.4341***	0.9095
	(0.1636)	(0.0567)	(0.0732)	(0.0461)	(0.0627)	(0.0583)	(0.1721)	(0.2463)	(0.0889)	(0.0866)	(0.2529)
ln*Amount*·*t*	0.9956**										
	(0.0019)										
PostFunded	0.4278***	0.7108	0.5201	1.6949	0.6052	0.2565**	0.3364***	1.0156	0.7186	0.5493	2.0761
	(0.1239)	(0.3700)	(0.2118)	(1.2275)	(0.2436)	(0.1509)	(0.1337)	(1.1181)	(0.4672)	(0.2142)	(2.1669)
VDAX	1.0075	0.9891	0.9488	1.0018	0.9681	0.9890	0.9895	0.9556	0.9969	0.9697	0.9681
	(0.0294)	(0.0836)	(0.0376)	(0.0485)	(0.0357)	(0.0672)	(0.0535)	(0.1356)	(0.0441)	(0.0392)	(0.0651)
Portal	1.7839**	20.9530***	1.6994	4.0142***	1.8455**	5.6336***	0.4938**	0.8727	1.9614	1.5112	0.8261
	(0.4483)	(13.8625)	(0.5835)	(1.8277)	(0.4619)	(2.0697)	(0.1626)	(1.4189)	(1.1101)	(0.4483)	(0.3156)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	380	380	380	380	380	380	380	380	380	380	380

Table 8: Time to first Update.
This table reports upon hazard rates of a Cox Proportional Hazard Model and marginal effects of a negative binomial regression using the Investor Data Set. The dependent variable is the time passed before the first update is published (*Time*). Model 1 and 2 do not consider updates posted on the very first day of campaign, models 3 and 4 include updates posted on the first day. In models 1 and 3 we estimate a Cox Proportional Hazard Model in models 3 and 4 a negative binomial regression. *FundingGoal* is denoted in 10,000 EUR. *, ** and *** denote significance at a 10%-, 5%- and 1%-level.

	Model 1	Model 2	Model 3	Model 4
$\#Investments_{t=1}$	1.0019	−0.0270		
	(0.0031)	(0.0223)		
$\%Invested_{t=1}$	0.8957	−0.6231		
	(0.1824)	(1.4694)		
Update1Day	2.3052*	−1.2878		
	(1.0285)	(2.9089)		
Portal	1.1230	−4.1340	2.2760**	−10.2619***
	(0.5329)	(3.1047)	(0.9069)	(3.6149)
EquityShare	224.4835	−24.4252	886.9319	−62.9241
	(1335.9686)	(47.3784)	(5361.6060)	(56.9074)
FundingGoal	224.4835	0.1046	0.9704	0.4514
	(1335.9686)	(0.3569)	(0.0436)	(0.4271)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
# Obs.	71	57	71	57
$Pseudo - R^2$	0.0850	0.072	0.0832	0.0786

Table 9: Probability of Updates, Fixed-Effects Logit Estimation.
The table reports upon odd's ratios of the fixed-effects logit estimation using the Investor Data Set. The natural logarithm of *Amount* is used and *#Investments* is denoted in 1,000. *, ** and *** denote significance at a 10%-, 5%- and 1%-level.

	Update	*Team*	*BusinessModel*	*Certification*	*Product*	*Cooperation*	*Campaign*	*NewFunding*	*Business*	*Promotions*	*Emotional*
Alarm	1.0796	0.0000	1.6330	1.2615	0.4786	0.9925	1.9731	0.0000	4.6661**	2.1227	$1.156 \cdot 10^7$
	(0.5572)	(0.0040)	(1.1140)	(1.4469)	(0.5096)	(0.7899)	(1.7112)	(0.0062)	(2.8930)	(1.8249)	$(1.0813 \cdot 10^{10})$
$\#Investments_{t-1}$	6.1381***	39.2974***	3.0519	2.3047	7.3930***	7.1817**	2.2531	4.0563	5.6256*	7.9231***	6.7288*
	(3.4624)	(45.0491)	(2.7057)	(2.8926)	(5.4082)	(6.0548)	(2.9512)	(6.1292)	(5.4165)	(5.2887)	(6.8310)
$\ln Amount_{t-1}$	0.9674	0.8000	0.9574	0.9991	0.9353	0.9878	1.0819	1.0592	1.0713	0.9269	0.9108
	(0.0552)	(0.1424)	(0.0803)	(0.0931)	(0.0800)	(0.0987)	(0.1183)	(0.1927)	(0.1026)	(0.0815)	(0.1306)
VDAX	1.0271	0.9175	0.9874	1.0404	1.0084	0.9895	0.9958	1.0040	1.0111	1.0307	0.9246
	(0.0291)	(0.0758)	(0.0415)	(0.0519)	(0.0413)	(0.0540)	(0.0553)	(0.0982)	(0.0496)	(0.0446)	(0.0694)
PostFunded	0.7614	0.1115***	0.6288	2.6651*	0.7796	1.0560	0.7010	1.1589	1.4739	0.6132	1.9475
	(0.1839)	(0.0802)	(0.2177)	(1.4163)	(0.2633)	(0.4815)	(0.3667)	(1.4006)	(0.6196)	(0.2231)	(2.2276)
# Obs.	4,387	1,963	3,923	3,318	3,675	2,810	2,918	1,388	3,278	3,662	2,160
$Pseudo - R^2$	0.0056	0.0578	0.0038	0.0069	0.0072	0.0064	0.0036	0.0053	0.0120	0.0108	0.0201