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Equity Crowdfunding in Germany and the UK: Follow-up Funding and Firm Survival

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Equity Crowdfunding in Germany and the UK: Follow-up Funding and Firm Survival

Abstract

Today, start-ups often obtain financing via the Internet through many small contributions of non-sophisticated investors. Yet little is known about whether these start-ups can ultimately build enduring businesses. In this paper, we hand-collected data from 38 different equity crowdfunding (ECF) portals and 656 firms that ran at least one successful ECF campaign in Germany or the United Kingdom. The evidence shows that German firms that receive ECF stand a higher chance of obtaining follow-up funding through business angels or venture capitalists and have a relatively lower likelihood to survive. We find firm age, the average age of the management team, and excessive funding during the ECF campaign all have a negative effect on firms' likelihood to obtain post-campaign financing. By contrast, the number of senior managers, registered trademarks, subsequent successful ECF campaigns, crowd exits, and the amount of the funding target all have a positive impact. Subsequent successful ECF campaigns, crowd exits, and the number of venture capital investors are significant predictors reducing firm failure. Finally, we find that some of these factors have a differential impact for Germany and the United Kingdom.

JEL-Codes: G240, M130.

Keywords: equity crowdfunding, follow-up funding, firm survival.

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1. Introduction

Equity crowdfunding (ECF) has recently received considerable attention in the academic literature. While only a few years ago this new way of financing was largely considered a niche phenomenon, in many countries it has now become an ordinary source of early-stage financing for start-up firms. In the United Kingdom (UK), for example, the ECF market has even approached the size of the early-stage business angel (BA) and venture capital (VC) market (Zhang et al. 2016). Until now, most research has focused on the success factors of ECF campaigns (Ahlers et al., 2015; Hornuf and Schwienbacher, 2015, 2017a; Ralcheva and Roosenboom, 2016; Vismara, 2017; Vulkan et al., 2016) and the determinants of crowd engagement (Agrawal et al., 2015; Block et al., 2017c; Hornuf and Neuenkirch, 2017; Vismara, 2016). Little is known, however, about the propensity of crowdfunded firms to build an enduring business. In this paper, we address this important gap in the literature by analyzing the determinants of follow-up financing and ultimate firm failure.

In an early contribution, Signori and Vismara (2016) investigate firm success and failure in the UK by calculating the return on investments for 212 successfully funded ECF campaigns that obtained financing on Crowdcube. They find that 10% of the firms failed, while 30% obtained one or more seasoned equity offerings, from either a private equity injection or another ECF round on Crowdcube or by being the target of a merger or acquisition transaction. The evidence shows that the presence of non-executives, patents, and tax incentives are associated with post-campaign success. Moreover, the presence of professional investors was a good predictor of firm survival. Hornuf and Schmitt (2016) analyze the success and failure of crowdfunded firms in Germany and the UK and find that more firms in Germany managed a crowd exit through a significant VC round while somewhat fewer firms ultimately failed in the UK.

The current study takes a double-sided approach by investigating the determinants of follow-up funding and firm failure after an ECF campaign. Moreover, we analyze campaigns on 36 ECF portals in Germany and on two leading portals in the UK. Our findings should thus provide significant external validity regarding the determinants that help firms build an enduring business. Moreover, follow-up funding and especially firm survival are important factors that help policy makers evaluate whether ECF is an efficient and worthwhile form of financing. We investigate several potential determinants of follow-up funding and firm failure: firm characteristics such as registered trademarks; the size, age, and gender composition of the management team; filed and granted patents; different ECF campaign

characteristics; and the current financial situation of the firm. Furthermore, we analyze the differential effect of these determinants in Germany and the UK.

To provide evidence on our research questions, we hand-collected data for 656 firms that ran at least one successful ECF campaign. We find a negative effect of firm age, the average age of the management team, and excessive funding during the ECF campaign on the likelihood of receiving follow-up funding after a successful ECF campaign. The number of senior managers, registered trademarks, subsequent successful ECF campaigns, crowd exits, and the amount of the funding target had a positive effect on follow-up funding. Existing BA/VC investors attracted even more peers after a successful ECF campaign. Not surprisingly, firms that did not obtain capital as part of an ECF campaign performed rather poorly in obtaining other forms of follow-up funding. The capital structure of the firm as measured by the ratio of equity to total assets had no effect on follow-up funding.

Subsequent successful ECF campaigns, crowd exits, and the number of VC investors were also significant predictors reducing firm failure. Firms that did not obtain ECF were more likely to fail. This result might be considered a noisy indicator for an efficient selection process and the wisdom of the crowd. Conversely, firms that did not obtain ECF might be in a relatively worse financial condition and therefore should not be compared with firms that raised capital on an ECF portal.

In line with Hornuf and Schmitt's (2016) study, we find that UK firms had somewhat fewer crowd exits, but their survival rates were higher on average. Moreover, evidence shows that the number of senior management team members, granted patents, crowd exits, and the total amount of capital raised during the ECF campaign have a differential effect on follow-up funding in Germany and the UK. By contrast, the age of the firm at the end of the first campaign, the share of female senior management team members, and the total number of ECF investors differently affect firm survival in the two countries. While older firms increase the likelihood of failure in the UK, female senior managers and the number of ECF investors increase the likelihood of firm failure in Germany. The latter result might be because ECF portals in Germany broker mezzanine financial instruments such as subordinated profit-participating loans (*partiarische Darlehen*), silent partnerships (*stille Beteiligungen*), and non-securitized participation rights (*Genussrechte*). These contracts mimic the returns of equity shares but come with little or no control rights that could have an impact on the management of the start-up (Klöhn et al. 2016). If such control by the crowd is important for firm

performance, the start-ups on UK portals that broker real equity shares might have a comparative advantage.

By identifying selection criteria for crowd and professional investors such as BAs/VCs, which invest in this new asset class for the first time, our study adds to the recent literature in entrepreneurial finance (Block et al., 2017a, b). Moreover, by reducing the degree of uncertainty of ECF investments and allowing investors to base their investment decisions on empirical evidence, our research reduces prejudices among traditional investors. Making the factors that contribute to the success and failure in ECF more salient not only benefits various investor types but also helps stabilize and establish a new market segment of entrepreneurial finance. If firms that have a positive net present value now for the first time receive capital through the crowd, ECF is a potentially welfare-enhancing activity. Helping portal managers and investors differentiate lemons from potentially enduring businesses thus fosters economic growth and employment.

The remainder of this paper proceeds as follows: in the next section, we provide a brief definition of ECF. Section 3 provides the theoretical framework of our study and develops hypotheses. Section 4 introduce the variables used in the regression, describes the data sources, and explains the method applied to identify the determinants of follow-up funding and firm failure. From this, section 5 outlines our descriptive and multivariate results. Section 6 discusses our findings, links them to the existing literature streams, and summarizes our contributions to the relevant policy debate.

2. Equity crowdfunding

ECF is a sub-category of crowdfunding, which differs substantially from other forms such as donation-based or reward-based crowdfunding. Donation-based crowdfunding often involves the funding of artistic or philanthropic projects. Under this model, backers donate their funds without receiving a specific compensation. Altruistic motives and feelings of warm glow therefore play a crucial role when backers support projects. This is different under the reward-based model of crowdfunding, in which backers are promised tangible or intangible perks (e.g., a coffee mug, having their name posted in the credits of a movie). In reward-based crowdfunding, backers also finance a product or service, which the venture still must develop and backers intend to consume later on. Under the ECF model, backers expect financial compensation. Until now, the extent of altruistic and financial motives of investors in ECF has been largely under-researched. It seems unlikely, however, that investors expect financial

returns from ECF to contribute to their personal savings plan or even a retirement savings portfolio.

To convince the crowd to finance a start-up via an ECF platform, entrepreneurs in some jurisdictions offer equity shares in a limited liability company (LLC). In the UK, common equity shares are offered on portals such as Crowdcube or Seedrs. By contrast, start-ups in Germany do not offer common equity shares, because transferring LLC shares requires the costly service of a notary. German firms engaging in ECF therefore draft financial contracts in the form of profit-participating loans or silent partnerships that mimic the future cash flows of the firm and are only paid out after the investment contract expires or a new investor buys a substantial fraction of the firm. ECF also differs from marketplace lending or loan-based crowdfunding, in which investors finance loans and receive a pre-determined, periodic interest payment in return.

Start-ups that aim to raise capital in an ECF campaign negotiate the valuation of the firm with the portal and decide how much capital they want to raise. The portal provides a boilerplate financial contract, which establishes the financial relationship between the start-up and the crowd. Most portals allocate funds under one of two models: all-or-nothing or keep-it-all (Cumming et al., 2017). Under the all-or-nothing model, which is the predominant model in Germany and the UK, founders set a funding goal and keep nothing unless this goal is reached. In many campaigns, the funding goal is set at 50,000 EUR. If the funding goal cannot be reached during the funding period, the potential investors receive the capital they had previously pledged back. This process is different in the United States (US), where reward-based crowdfunding portals such as Indiegogo run a keep-it-all model and start-ups can decide whether to keep the money pledged independent of whether the funding goal was reached or not. Furthermore, most portals in Germany and the UK allocate shares under a first-come, first-served model, in which the start-ups set a funding limit and stop selling shares after the funding limit is reached.

Finally, it should be mentioned that most start-ups raising capital through ECF avoid legal disclosure requirements by using the exemptions from the national prospectus regime. This is achieved by raising overall amounts of less than 2,500,000 EUR in Germany and 5,000,000 EUR in the UK (Hornuf and Schwienbacher, 2017b).

3. Theory and hypotheses

3.1. Theoretical considerations

Little is known about the determinants that affect follow-up funding and firm survival of equity-crowdfunded start-ups. While human capital theory and organizational ecology offer general insights into the determinants of firm survival (Brüderl et al., 1992), the financial contracting and the allocation mechanism of shares in ECF are still new and thus might lead to atypical outcomes. Our hypotheses and empirical analysis therefore inevitably remain to some extent original and exploratory. Nevertheless, we test whether the factors affecting follow-up funding and firm survival in BA/VC finance are important in ECF as well. Furthermore, we investigate whether the specific features of an ECF campaign determine the likelihood that start-ups ultimately build enduring businesses or not. Before we outline our hypotheses, it should be noted that whether a start-up can build an enduring business generally depends on two factors. First, start-ups capable of sending effective signals in the spirit of Spence (1973) to potential investors should receive more capital and, as a result, also have a lower probability of firm failure. Second, independent of whether firms can send effective signals, some firms might be inherently more valuable and thus might have a lower probability of failure. However, if investors cannot observe the value of a firm, these firms will in some cases lack the necessary capital and therefore have a higher probability of failure.

3.2. Hypotheses

We hypothesize that the management team has an impact on follow-up funding and firm survival. We differentiate our hypothesis about the management team according to its size, age, and gender.

Empirical research on large and publicly traded companies indicates a negative relationship between board size and firm performance (Coles et al., 2008; Guest, 2009; Yermack, 1996). According to Jensen (1993) and Lipton and Lorsch (1992), the main reason larger boards are less efficient is that they face difficulties in solving the agency problem among the board members. Bennedsen et al. (2008) investigate the boards of small and medium-sized companies and find no performance effects when the board size was below six directors. While the board is the highest authority in the management of the firm, start-ups might not even have a board of directors, but a management that consists solely of one or two founders, who supervise a handful of employees. On the one hand, starting a business alone can be difficult and cumbersome because of a lack of competences and capacity constraints. On the

other hand, the larger the management team of a start-up becomes, the more likely are disputes among management team members to arise. In line with that reasoning, Chowdhury (2005) shows that entrepreneurial team size is negatively correlated with team effectiveness. Moreover, sometimes only a single extraordinary person is necessary to turn a poorly performing firm around. A well-known example is the return of Steve Jobs to Apple in 1997, which helped the firm quickly gain on performance again. We therefore expect that a larger management team has a negative effect on firm performance and, therefore, follow-up funding and firm survival.

H1a: Management team size decreases the probability of follow-up funding and increases the probability of firm failure.

The average age of the management team can have two opposing effects on follow-up funding and firm survival. On the one hand, age comes with experience. Older managers often have more industry and leadership experience, which allows them to create a more successful company (McGee et al., 1995). In a conjoint experiment with 51 VCs from Munich, Berlin, and Vienna, Franke et al. (2008) show that fund managers evaluate older start-up teams more positively in general; a management team of only young members receives a lower team evaluation by VCs. Thus, experienced management team members might help the firm acquire follow-up funding and survive. On the other hand, younger managers are not stuck in old patterns of thinking and are close to trending markets. A well-known anecdotal example is Mark Zuckerberg, who founded Facebook at the age of 20 and appealed to the need of many young people to connect with friends online. Consequently, Facebook became the most famous online social network worldwide. Young age may therefore ensure higher growth rates for the future (Stuart and Abetti, 1990). Thus, young managers may raise the chance of receiving follow-up funding from BAs/VCs searching for high-growth start-ups. By contrast, firm survival might be negatively correlated with the greater risk affinity of young managers, which potentially comes with their higher innovativeness.

A management team with a large degree of age heterogeneity might combine the advantages of being young and senior, resulting in better firm performance. Greater diversity may bring both extensive industry experience and knowledge of trending markets. However, different perspectives, caused by age disparities, can also lead to lower team performance stemming from potential disagreement and disunity. Chowdhury (2005) interviewed 174 entrepreneurs in 79 entrepreneurial teams that worked in start-ups that were between two and five years in

operation. He finds that a large team age heterogeneity decreases team effectiveness. In a similar vein, Franke et al. (2008) show that teams with a higher age heterogeneity receive a worse evaluation by VCs. We conjecture that such a loss of team effectiveness affects firm performance and firm valuation, leading to a lower rates of VC funding and a higher likelihood of failure.

H1b: A higher average age of the management team increases the probability of follow-up funding and decreases the probability of firm failure. Higher age heterogeneity decreases the probability of follow-up funding and increases the probability of firm failure.

Fairlie and Robb (2009) compare the performance of 13,918 female-owned firms with 24,102 male-owned firms in the US from 1992 to 1996. They find that female founders have lower survival rates, profits, and sales and fewer employees. However, in a more recent study, Robb and Watson (2012) find no difference in the performance between 1,041 female-owned and 2,975 male-owned US firms. The difference is mostly driven by their use of firm size–adjusted performance measures, which allows them to consider that female-owned firms tend to be smaller.

The evidence on gender and credit constraints is largely mixed. While Bellucci et al. (2010) show that female entrepreneurs face tighter credit availability, Cavalluzzo and Cavalluzzo (1998) find the opposite to be true (see also the meta-studies of Terjesen et al. [2009] and Post and Byron [2015]). Furthermore, Alsos et al. (2006) find in their survey that women receive significantly less equity and debt capital, which also negatively affects the growth rates of female-owned firms. We thus hypothesize that female founders in ECF might find it more difficult to obtain follow-up funding, which in turn might affect firm survival because of the lack of capital.

H1c: A higher share of women in the management team decreases the probability of follow-up funding and increases the probability of firm failure.

Patents and trademarks can affect follow-up funding and firm survival because they provide a signal for the innovativeness and brand value of the firm. They also allow the start-up to protect its intellectual property and brand. Overall, the impact of patents and trademarks should be positive for follow-up funding and firm survival. Especially trademarks are important for young firms. De Vries et al. (2017) show that start-ups are more likely to file trademarks than patents when entering the market. BAs/VCs might base their funding

decisions on firms' trademarks or ability to obtain a granted patent. For that reason, firms that possess trademarks and patents might receive more funding and thus have a higher chance of firm survival.

In general, firms may overcome information asymmetries between investors and entrepreneur by using patents and trademarks to effectively signal their quality. Hsu and Ziedonis (2013) examine a sample of 370 US semiconductor start-ups and find that patents have a positive effect on firm evaluation by VCs. In the context of biotechnology, Haeussler et al. (2014) show that patent applications are positively related to follow-up VC investments. In addition, patents might reveal that the firm was able to create an innovation and will do so in the future (Farre-Mensa et al., 2017). With respect to trademarks, Block et al. (2014) report that especially in early funding rounds, trademark applications are highly valuable for VCs and lead to higher firm valuations. In their study, the impact on the valuation by trademarks is even higher than that for filed patents. The authors assume that this is due to the higher success rate of applications for trademarks than for patents. Furthermore, Zhou et al. (2016) show that start-ups that applied for both patents and trademarks obtained higher valuations by VCs. Overall, we conjecture that patents and trademarks lead to a higher chance of receiving follow-up investments by BAs/VCs.

Regarding firm survival, we expect that firms that filed or were granted patents might be more innovative and, thus, more successful. In addition, intellectual property protection allows the firm to reap monopoly profits during the duration of the patent. Farre-Mensa et al. (2017) show that start-ups with patents have a 80% higher sales growth five years after they filed the first patent application and higher-quality follow-up innovation. Therefore, their ability to build an enduring business should be greater. A similar rationale might hold for trademarks, which allow firms to make use of a valuable brand and be more successful. Block et al. (2014) explain that trademarks not only have a signal effect on investors but also have a protection value for the firm. Trademarks protect the firm's brand and thus might offer a higher chance of survival. In support of this, Helmers and Rogers (2010) find that trademarks and patents lead to lower probability of firm failure. We therefore expect a positive effect of patents and trademarks on firm survival.

H2: Patents and trademarks increase the probability of follow-up funding and decrease the probability of firm failure.

Campaign characteristics, such as the number of investors and the total amount raised, provide important insights into the quality and ultimate success of the start-up (Ahlers et al., 2015; Hornuf and Schwienbacher, 2017a). Investing in a firm and spending a larger amount of money in total suggest that people believe in the firm's quality and prospects. If a 'wisdom of the crowd' exists in crowdfunding, as Mollick and Nanda (2015) suggest, crowd support is a good predictor of follow-up funding and firm survival. Moreover, firms that obtained more funding through an ECF campaign are in a better financial condition than firms that received less money during an ECF campaign. Therefore, we hypothesize that funding success during an ECF campaign results in a higher chance of follow-up funding by BAs/VCs and, thus, a lower chance of firm failure.

Whether a successful reward-based crowdfunding campaign positively affects follow-up funding is not yet established in the literature. Ryu and Kim (2017) show that firms that ran a successful reward-based crowdfunding campaign have a lower chance of receiving follow-up funding by VCs. By contrast, Kaminski et al. (2016) show that reward-based crowdfunding campaigns lead to subsequent VC investments. Colombo and Shafi (2017) provide evidence that firms with external financing before their crowdfunding campaign receive even more follow-up funding when they perform badly and deliver their product late. Drover et al. (2017) investigate the impact of crowdfunding on the VC screening process. They find that a successful crowdfunding allows for certification effects and positively influences the decision of a VC to fund the start-up. Therefore, we expect that a large amount of crowd participation predicts the future interest of BAs/VCs.

By running a survey among entrepreneurs who ran a Kickstarter campaign, Stanko and Henard (2017) show that the number of backers in reward-based crowdfunding positively affects the product-market performance of the venture after the campaign. In general, better sales performance should help the firm survive. Furthermore, the larger the investor community, the more people are interested in the success of the firm. Crowd investors who are convinced about the product might also promote the firm via their social and business networks. We therefore expect that a larger amount of interest during the ECF campaign leads to a higher chance of firm survival.

H3: Interest in an ECF campaign increases the probability of follow-up funding and decreases the probability of firm failure.

We conjecture that certain financial indicators predict both the follow-up funding by BAs/VCs and the chance of firm survival. We consider a firm's financial situation according to the number of BAs/VCs that have previously supported it and the ratio of total equity to total assets. The number of BAs/VCs positively influences a firm's prospects for various reasons. Drover et al. (2017) show that the certification effect of prior BA investments allows for VC investors' positive assessments of the start-up. Furthermore, VCs tend to syndicate with one another (Lerner, 1994). In general, syndicate VCs' performance is better, and their portfolio companies have a higher chance of surviving (Hochberg et al., 2007). VCs' networks allow them to improve the quality of deal flow by sharing information and expertise. Therefore, we hypothesize that a greater number of BAs/VCs might attract further investments by other BAs/VCs. In other words, as firms with a large syndicate of VC investors have better performance, we expect that the probability of firm survival is higher if more BAs/VCs are engaged.

Furthermore, we use the ratio of total equity to total assets as a variable for the capital structure. A small ratio of total equity to total assets might predict firm failure due to the lack of capital and low profit or no profit at all. However, it might not be a predictor of follow-up funding, as potential investors of the start-up focus more on the firm's prospects and less on the current capital structure. Nevertheless, we expect that a low or negative ratio of total equity to total assets might lead to a higher chance of prospective firm failure.

H4: BA/VC syndication and sound financials increase the probability of follow-up funding and decrease the probability of firm failure.

In 2015, the UK ECF market was 10 times larger than the German market (Dorfleitner et al., 2017). The question therefore is: What are the reasons for these differences, and how do they affect follow-up funding and firm failure? Potential explanations for the larger UK market might be tax advantages,¹ the benefit of London as a financial center,² and the possibility of real equity investment in the UK compared with the mezzanine financial instruments offered in Germany. The benefits of tax advantages might make investors less cautious and inclined to invest in riskier start-ups, because only a fragment of their investment is actually lost in case of firm failure. The presence of London as a financial center might be an indicator of more financial sophistication among investors. Furthermore, in the case of high information asymmetry, riskier firms tend to offer non-convertible debt rather than common equity and, in

¹ The UK provides two tax reliefs for investors. Both the Enterprise Investment Scheme and the Seed Enterprise Investment Scheme offer a tax relief of up to 30% and 50%, respectively.

² Vulkan et al. (2016) show that approximately 38% of all pledges come from London.

this way, provide a signal of their type (Stiglitz and Weiss, 1981). This mechanism is to some extent not a factor in Germany, because equity offers are virtually non-existent. The availability of debt and equity financing could therefore represent an advantage of the UK market, resulting in a better selection process that manifests itself in higher firm survival rates. Finally, because of the large number of firms that obtain ECF in the UK, more firms with lower growth expectations and a higher risk of failure could also receive ECF. Moreover, with respect to follow-up funding, the overall VC market in the UK in 2016 was 4.8 billion USD compared with 1.9 billion USD in Germany.³ Therefore, we expect that more follow-up funding is naturally available in the UK than in Germany; we are not aware of any general difference between the two countries in start-up performance and firm survival.

H5: The unique market conditions in Germany and the UK have a differential impact on follow-up funding and firm survival in ECF.

4. Data and method

4.1. Data

For the period from September 24, 2011, to June 30, 2016, we hand-collected data on 656 firms⁴ that ran at least one successful ECF campaign in Germany or the UK. We collected the data directly from the ECF portal websites. Our initial data set consists of information about the ECF campaign characteristics. We merged this data set with additional information on firm characteristics from the Bureau van Dijk (BvD) Orbis and Zephyr databases, Thomson Reuters Eikon, CrunchBase, and the German company register (*Unternehmensregister*).

4.2. Dependent variables

We investigate two events in our study, so we use of two dependent variables. The first variable measures the event of receiving follow-up funding by BAs/VCs at time t after the firm's first successful ECF campaign. The primary data source is BvD Orbis and Zephyr, CrunchBase, and Thomson Reuters Eikon. In an initial step, we identified the firms from our sample in Orbis. We then collected information about financing rounds from Zephyr, CrunchBase, and Thomson Reuters Eikon for these firms. We also systematically searched for additional information about follow-up funding on the websites of the firm, VCs, and ECF

³ Source: PitchBook database.

⁴ Our data set contains all the successful and unsuccessful German ECF campaigns and all the successful campaigns of the UK market leaders Crowdcube and Seedrs during that time.

portals and supplemented our data set accordingly. To exclude rumors and identify only actual equity investment by investors, we scrutinized the shareholder list of the corresponding firm. We consider the date of registering the investor on the shareholder list as the time of the investment.

To identify different shareholder types (BAs/VCs), we used the shareholder list from Orbis. The management team with shares is excluded. We defined investors as VCs if we found a company website with clear information about their investment activity as VCs. In our study, shareholders represent BAs if the shareholder is a private person who invested as a shareholder in at least two other companies. After identifying the initial investments by BAs/VCs, we used investments by outside BAs/VCs as a follow-up funding event for the duration analysis. For example, if a new investment round took place, we consider this a BA/VC funding round if new, outside investors became shareholders of the firm. This allows us to focus on the effect of outside investors on an ECF campaign.

The second variable captures a firm failure event—that is, whether a firm went insolvent, was liquidated, or was dissolved at time t after its first successful ECF campaign. We collected the data from the German company register (*Unternehmensregister*) and Companies House in the UK. We use the first announcement date of the insolvency or liquidation as the failure event. In some cases, insolvency proceedings were not initiated because of a lack of assets, and the firm was liquidated right away.

4.3. Independent variables

4.3.1. Firm characteristics

To control for firm characteristics, we consider three variables. First, to control for country-specific factors, we define a dummy variable that equals 1 if the firm is incorporated in the UK and 0 if it is incorporated in Germany. Second, we include a dummy variable that equals 1 if no minimum capital requirements exist for the respective legal form of the start-up seeking ECF and 0 otherwise. In Germany, the legal form is the *Unternehmergeellschaft (haftungsbeschränkt)* and in the UK the Ltd. Moreover, four partnership companies were seeking capital through ECF but were excluded from our sample because the numbers were too small to retrieve any meaningful analysis from them. Third, we control for the firms' age at the end of the first successful ECF campaign using the date of incorporation. We collected the information about firm characteristics from Orbis.

4.3.2. Management

To test H1 that the specific characteristics of the management team have an impact on follow-up funding and firm survival, we collected information about the senior management as of January 1, 2017, to investigate the impact of the size of the management team, average age, and share of female management. The senior management includes the CEO, managing partners, and managing directors. The variables consist of the number of senior management team members, the average age of senior management team members, and the share of female senior management team members. To capture age heterogeneity, we calculated the age difference between the oldest and youngest senior management team members. The source of the management team information is Orbis.

4.3.3. Trademarks and patents

Because trademarks and patents signal firm quality, we consider the number of filed patents, number of granted patents, and number of granted trademarks to test H2. The source for trademarks is Orbis and for patents PATSTAT and Orbis. We retrieved the data on January 1, 2017.

4.3.4. Campaign characteristics

To test H3, we derived several variables related to the ECF campaigns. The campaign characteristic variables are time-varying and change with any subsequent successful ECF campaign. These variables are the total amount of capital raised, the total amount of the funding target, the total number of investors, and the business valuation by the portal at the time of the ECF campaign. Furthermore, we consider the ratio of the amount raised to the funding target to test for the effect of overshooting and excessive funding. Moreover, if a firm is not able to set its funding targets correctly and thus cannot properly estimate how much money it can collect through ECF, BAs/VCs might assess the firm and its founders negatively. We collected this data from the ECF portal websites.

4.3.5. Financials

We measure the financial situation of the firms in two ways to test H4. First, we identified the current number of BA/VC investors via the shareholder list from Orbis. The variable is time-varying and changes with any follow-up funding event. Second, on a sub-sample of 287 firms, we derived information about the capital structure and used the ratio of total equity to total assets from Orbis.

4.4. Method

To examine the effect of various factors that may contribute to higher or lower hazards for the success or failure events of a start-up, we use a Cox semi-parametric proportional hazards model. The advantage of this model is that it does not require the specification of the time dependence distribution of the hazard. Furthermore, the model allows for right-censored data and time-varying explanatory variables. Clustered standard errors by industry allow us to consider industry-specific effects. Our observation period starts after the end of the first successful ECF campaign and lasts until failure or right-censoring as of June 30, 2016.

5. Results

5.1. Descriptive statistics

Table 1 shows descriptive statistics for the 656 firms in our sample. These firms ran 778 successful campaigns, 512 of which took place in the UK and 266 in Germany. The average amount raised is 340,271 EUR in Germany and 515,575 EUR in the UK (diff. 175,303 EUR, $p=0.001$).⁵ In the UK, on average 207 investors support an ECF campaign, while in Germany, 323 investors do so (diff. 116 investors, $p=0.000$). Most firms operate in the information and communication industry (26.22%), followed by the wholesale and retail business (17.68%) and manufacturing (16.16%) industries. On average, every second an ECF-financed firm received capital from a VC fund, while four of 10 firms received money from a BA. The average age of the crowdfunded firms at the end of their first successful campaign is 2.8 years. The average manager in the team is 44 years of age, and the team consists of 2.7 people on average. The average age difference between the oldest and youngest team member is nine years. Only some firms possess trademarks or patents. Every 10th firm filed for a patent, and only half as many were granted a patent. More than half the start-ups received a registered trademark.

[Table 1 around here]

5.2. Duration analysis of follow-up funding

We begin by discussing the descriptive statistics regarding the chance of receiving follow-up

⁵ We use the EUR/GBP exchange rate as of the date of the ending of the campaign.

funding after an ECF campaign, which are provided by a Nelson–Aalen cumulative hazard graph, categorized by country (see Figure 1).⁶ In Germany, there is a steady increase in the hazard of receiving funding after the first campaign. The picture is similar in the UK. Overall, in Germany around 38% of all firms received follow-up funding by an outside BA/VC 36 months after the first campaign, whereas only 22% of all UK firms received follow-up funding in the first 36 month after their first campaign. This contrasts with the greater amount of venture capital available in the UK. Comparing the German sub-sample of successful and unsuccessful funded firms, we find that firms are less likely to receive follow-up funding if their ECF campaign failed (see Figure 2).

We now turn to the Cox proportional hazard regressions to evaluate contributing factors to follow-up funding. We categorize the explanatory variables in segments: *firm characteristics* (baseline), *management*, *trademarks and patents*, *campaign characteristics*, and *financials*. Table 2 presents our results. In regressions (1) to (5), Panel A, we first consider each segment separately. In the baseline regression with firm characteristics only, the chances of follow-up funding are significantly lower for firms incorporated in the UK and older firms, a finding in line with the Nelson–Aalen estimates. The management variables are only partially in accordance with H1. Age heterogeneity and female participation do not influence follow-up funding. While team size leads to a higher chance of follow-up funding, an older management team has a lower chance. Thus, BAs/VCs appreciate younger managers who have hands-on knowledge about trending markets more than industry and leadership experience.

H2 is partially supported. The trademark and patent variables are significant for trademarks but not for filed or granted patents. Protecting the firm’s brand at this stage is apparently more important for BAs/VCs than determining whether the start-up is developing a higher-quality innovation. The regression results for the campaign characteristic variables show that subsequent successful ECF campaigns, crowd investor exits, and the total amount of the funding target are significant predictors of follow-up funding. Thus, campaign success of follow-up ECF campaigns can explain further investments by BAs/VCs. The total amount of capital raised or the total number of investors is not a predictor of follow-up funding though. Furthermore, firms raising more capital during an ECF (overshooting) than initially estimated

⁶ In contrast with the Kaplan–Meier estimates, the advantage of using the Nelson–Aalen cumulative hazard function is that repeated events, such as several BA/VC investments in one firm, can be considered.

is perceived as a negative signal by BAs/VCs. Moreover, a good predictor of follow-up funding after the ECF campaign is the number of VC investors that engaged in the firm before the ECF campaign took place. This result is in line with H4.

In regression (6), Panel B of Table 2, we consider all explanatory variables together. The results are similar to those in regressions (1) to (5). In regression (7), we use a sub-sample of firms with detailed financial information and add the ratio of total equity to total assets as an additional variable to the regression. However, we do not find evidence that the capital structure is an important factor for BAs/VCs to make funding available.

Furthermore, we test H5 about the differential impact of our variables of interest for the UK and Germany. Regression (12), Panel C of Table 2, shows the results. We use interaction dummies with almost every variable that had sufficient variation. We find that granted patents and subsequent successful campaigns are relatively less important for follow-up funding in the UK than in Germany. The significant effect of crowd exit might be due to the fact that only two exits took place in the UK so far.⁷ Furthermore, we find a relatively stronger syndication effect for BAs in the UK; the overall number of BAs leads to a higher chance of follow-up funding.

Firms that received ECF from more popular portals might also have better chances of receiving follow-up funding. In regressions (15) and (16), Panel D of Table 2, we approach this explanation using a sub-sample that consists of firms that received funding from the two largest UK portals (Crowdcube and Seedrs) and the three largest German portals (Companisto, Innovestment, and Seedmatch). We consequently dropped 240 firms from our sample that were funded on 33 minor German ECF portals. The results are similar to the large sample that included start-ups funded on smaller portals.

To test H3, regressions (17) and (18) consider a sub-sample of German firms with successful and unsuccessful ECF campaigns. Regression (17) includes a dummy for firms that never ran a successful ECF campaign, while regression (18) includes a variable that counts the number of unsuccessful campaigns after the first successful campaign. Both variables are highly significant and lower the chance of follow-up funding.

⁷ As of January 1, 2017, E-Car Club and Camden Town Brewery cashed out their crowd investors.

For robustness checks, we apply accelerated failure time (AFT) models with an exponential distribution and a Weibull distribution. An advantage of AFT is that the coefficients of this model can be intuitively interpreted in terms of which variable accelerates or decelerates the occurrence of the event of failure or follow-up funding. The results appear in regressions (8) to (11), Panel B of Table 2, and regressions (13) and (14), Panel C. Using this slightly different estimator hardly affects our results.

[Table 2 around here]

5.3. Survival analysis

Figure 3 and Figure 4 depict the Kaplan–Meier curves of the survival rates of ECF funded firms. The chance of failure is somewhat higher for German firms than for UK firms. After 36 months, 20% of UK firms and 24% of German firms failed. Using the German sub-sample of successful and unsuccessful campaigns, we find that firms that never ran a successful campaign are more likely to fail. However, only 67% of the firms that ran an unsuccessful ECF campaign are still operating 36 months after the ECF campaign.

We now turn to the Cox proportional hazard regressions to evaluate the contributing factors to firm failures. Again, we categorize the explanatory variables in segments: *firm characteristics* (baseline), *management*, *trademarks and patents*, *campaign characteristics*, and *financials*. Table 3 presents our results. In regressions (1) to (5), Panel A, we first consider each segment separately. Beginning with the baseline regression, the results show that a firm’s location and age do not affect firm survival. The management variables, testing H1, are also not significant and have no effect on firm survival. Given the mixed evidence in the literature, this is what we might partly expect for the management team age and gender variables. In contrast with our expectations, team size and age heterogeneity also do not exert a significant effect. Moreover, the trademark and patent variables, which test H2, show no significant impact on firm survival. However, when firms run a successful follow-up ECF campaign or can buy the crowd out, they are more likely to survive. The campaign characteristic variables thus partially support H3. The number of VC investors significantly lowers the risk of firm failure, which is also in line with H3.

In regression (6), Panel B of Table 3, we consider all variables together. The results are mostly in line with regressions (1) to (5). However, the impact of VC investments vanishes.

As in our analysis on follow-up funding, regression (7) considers our sub-sample of firms for which data on capital structure were available. The ratio of total equity to total assets had no explanatory power on firm survival. At this stage of firm development, other factors are apparently more important.

Regression (12), Panel C of Table 3, investigates H5 regarding the differential impact of our explanatory variables on firm failure. We use interaction dummies with every variable that has sufficient variation. The regression results show that older UK firms suffer from a higher risk of failure. However, UK firms with a high share of female managers are more likely to survive. This finding might be due to innate differences of female managers or differences in the access to capital. Furthermore, a higher business valuation comes with a higher risk of firm failure in the UK.

In regressions (15) and (16), we use the sub-sample of firms that received funding through one of the large ECF portals. Again, the results are similar to the complete sample.

To test H3, we consider the sub-sample of German firms with both successful and unsuccessful campaigns in regressions (17) and (18). H3 cannot be rejected, given that both variables measuring campaign success are significant and lower the risk of firm failure.

For robustness checks, regressions (8) to (11), Panel B of Table 3, and regressions (13) and (14), Panel C, show AFT models with an exponential distribution and a Weibull distribution. Again, the models display similar results for the most part.

[Table 3 around here]

6. Discussion and conclusion

A primary contribution of this paper is to provide first evidence of the determinants of follow-up funding and firm failure of start-ups that have received financing through an ECF campaign. Using hand-collected data from 38 ECF portals and 656 firms that ran at least one successful ECF campaign in Germany or the UK, we provide evidence that German firms stand a higher chance of obtaining follow-up funding through BAs/VCs and have a relatively lower likelihood of failure than their British counterparts. Moreover, we find that firm age, the average age of the management team, and excessive funding during the ECF campaign

have a negative effect on firms' likelihood to obtain post-campaign financing. By contrast, the number of senior managers, registered trademarks, subsequent successful ECF campaigns, crowd exits, and the amount of the funding target all have a positive impact. Subsequent successful ECF campaigns, crowd exits, and the number of VC investors are significant predictors reducing firm failure.

Furthermore, we find that some of these factors have a differential impact on follow-up funding and firm failure for start-ups located in Germany and the UK. While older firms have a higher likelihood of failure in the UK than in Germany, female senior managers and the number of ECF investors increase the likelihood of firm failure in Germany. These findings suggest various avenues of research for human capital theory, organizational ecology, and the comparative corporate governance literature. Further analysis of the management team might investigate whether female managers are discriminated against when applying for capital or simply pursue different goals when running a company in Germany and the UK. Furthermore, the number of ECF investors might have a differential impact in Germany and the UK due to differences in the financial instruments used or the governance features of the platforms. As ECF portals in Germany broker mezzanine financial instruments that mimic the returns of equity shares, but come with little or no control rights for investors, the management of the start-up might have a larger leeway when making decisions.

Further research is necessary to discern the welfare implications of ECF. While in this paper we compared the determinants of follow-up funding and firm failure in two countries, future research might compare crowdfunded firms with firms that have received other sources of financing. Doing so might enable researchers to determine the relative advantage of an ECF campaign on building an enduring business. While BAs/VCs have traditionally supported their portfolio firms with advice and their networks, ECF could also provide a fuzzy signal of early demand and the number of motivated backers willing to support the venture. Furthermore, little is known about the screening process of ECF platforms and their role in selecting valuable start-ups. How they determine start-ups' chances of building an enduring business could also be subject to further empirical investigations.

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Figure 1

Nelson–Aalen cumulative hazard estimates comparing the German and UK sample. The graph shows the time until the first follow-up funding by a VC investor or BA for successful campaigns.

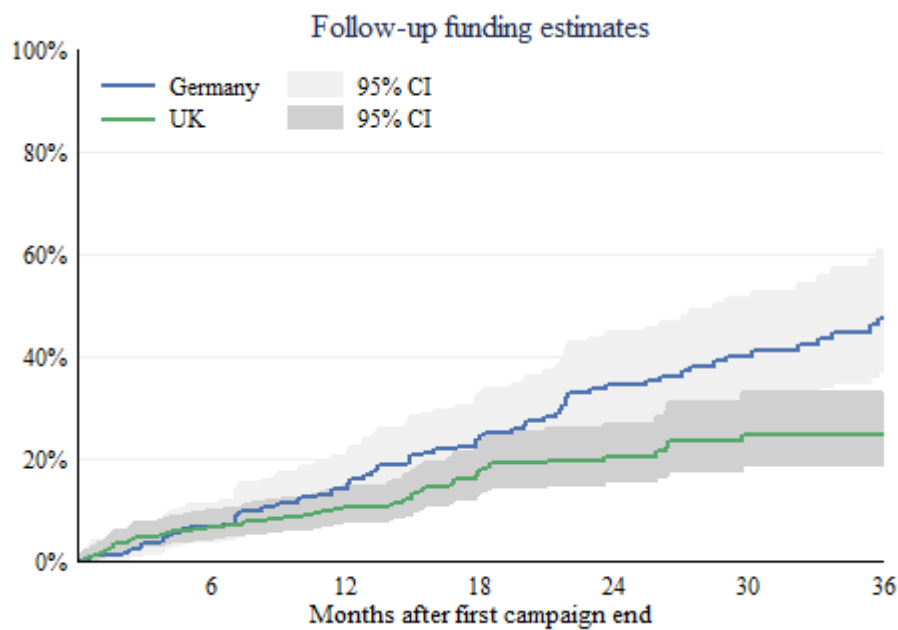


Figure 2

Nelson–Aalen cumulative hazard estimates for the German sample. Figure shows the comparison between firms with at least one successful ECF campaign and firms that never ran a successful ECF campaign. The graph shows the time until the first follow-up funding by a VC investor or BA.

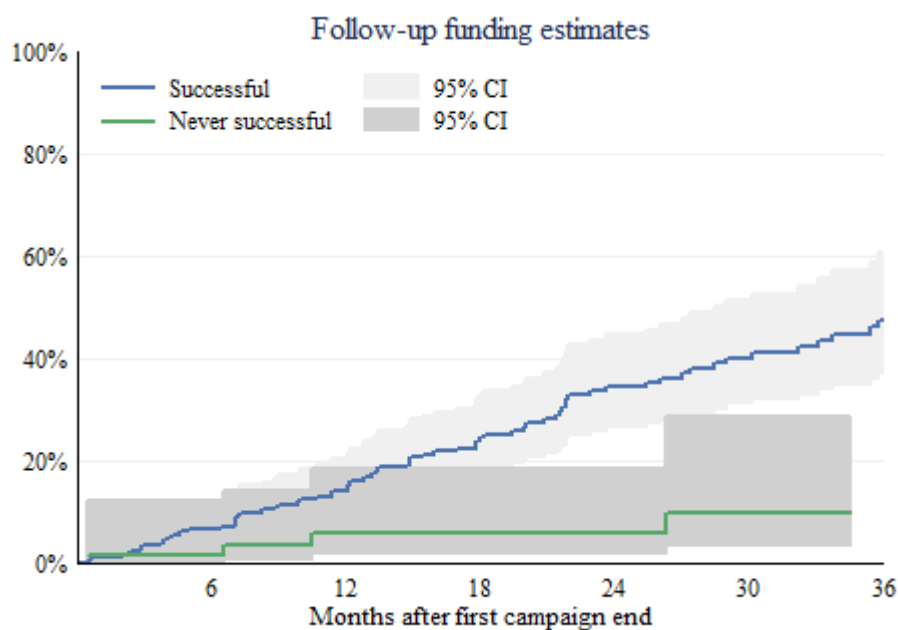


Figure 3

Kaplan–Meier survival estimates comparing the failure of German and UK firms after a successful ECF campaign.

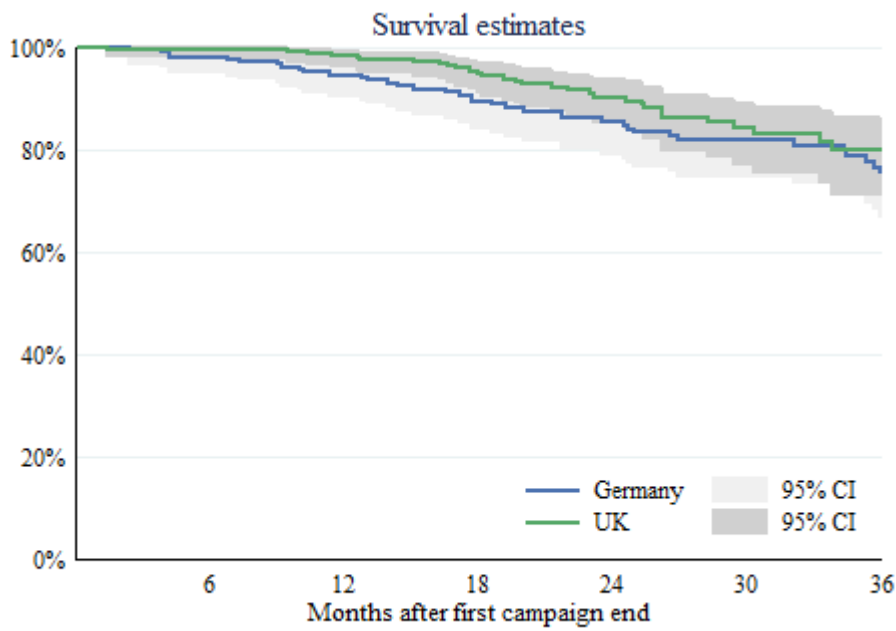


Figure 4

Kaplan–Meier survival estimates for the German firms. The figure compares firms with at least one successful ECF campaign and firms that never ran a successful ECF campaign.

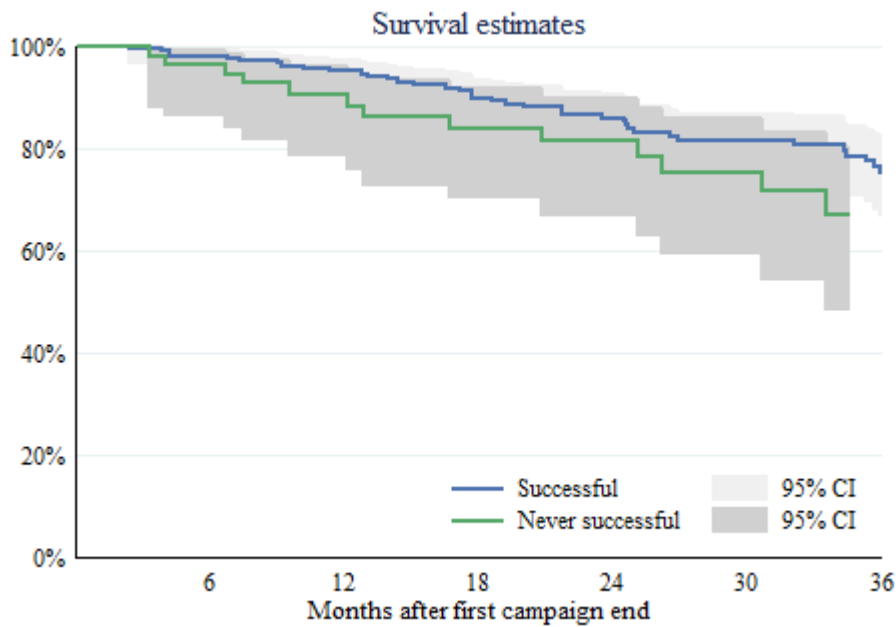


Table 1**Summary statistics.**

Panels provide summary statistics of 656 firms that ran at least one successful ECF campaign between September 24, 2011, and June 30, 2016. Column ‘Yes’ indicates that a dummy variable takes the value of 1. Panels B and C show sub-samples of firms from Germany and the UK, respectively. Variables reported are defined in Appendix A. Amount raised, funding target, and business valuation are in EUR.

PANEL A: Total sample

	Total						
	N	Mean	Std.-dev.	Minimum	Median	Maximum	Yes
<i>Events</i>							
Firm insolvency or liquidation	656	0.117	0.322	0	0	1	77
Number of VC investors	656	0.476	1.349	0	0	16	
Number of BA investors	656	0.419	1.245	0	0	12	
Number of successful campaigns	656	1.184	0.528	1	1	6	
<i>Firm characteristics</i>							
Age of the firm at end of first campaign	656	2.793	3.577	0.000	1.768	33.956	
LLC form with no capital requirements	656	0.040	0.195	0	0	1	26
<i>Management</i>							
Number of senior management	598	2.732	1.932	1	2	12	
Share of female senior management	577	0.139	0.273	0.000	0.000	1.000	
Average age of senior management	576	43.584	9.371	22	43	72	
Age difference of senior management	577	9.196	12.034	0.000	3.000	46.000	
<i>Trademarks and patents</i>							
Number of filed patents	656	0.090	0.555	0	0	8	
Number of granted patents	656	0.040	0.343	0	0	6	
Number of granted trademarks	656	0.520	1.462	0	0	19	
<i>Campaign characteristics</i>							
Amount raised	778	455,638.240	722,296.731	1,026.00	200,000.00	6,336,332.53	
Funding target	769	2,030,507.604	48,848,807.213	1,000.00	116,836.08	1,354,829,968.84	
Ratio of amount raised to funding target	761	1.681	19.473	0.033	0.730	432.900	
Number of investors	733	242.322	311.439	1	145	2702	
Business valuation	600	3,236,979.497	7,352,256.427	63,549.758	1,396,146.644	85,055,711.491	
<i>Financials</i>							
Number of subsequent successful campaigns	656	0.184	0.528	0	0	5	
Exit of the crowd	656	0.015	0.123	0	0	1	10
Ratio of equity to total assets	427	39.585	46.940	-95.932	43.584	100.000	
<i>Duration statistics</i>							
Time at risk in days	656	647.637		1	560	1741	

PANEL B: German Sample

	Germany						
	N	Mean	Std.-dev.	Minimum	Median	Maximum	Yes
<i>Events</i>							
Firm insolvency or liquidation	236	0.182	0.387	0	0	1	43
Number of VC investors	236	0.581	1.616	0	0	16	
Number of BA investors	236	0.814	1.815	0	0	12	
Number of successful campaigns	236	1.131	0.407	1	1	3	
Number of subsequent unsuccessful campaigns	236	0.030	0.193	0	0	2	
<i>Firm characteristics</i>							
Age of the firm at end of first campaign	236	2.823	4.645	0.000	1.481	33.956	
LLC form with no capital requirements	236	0.110	0.314	0	0	1	26
<i>Management</i>							
Number of senior management	222	1.734	1.087	1	1	8	
Share of female senior management	205	0.076	0.242	0.000	0.000	1.000	
Average age of senior management	205	41.387	8.860	22	39	68	
Age difference of senior management	205	2.020	5.230	0.000	0.000	39.000	
<i>Trademarks and Patents</i>							
Number of filed patents	236	0.119	0.635	0	0	5	
Number of granted patents	236	0.059	0.457	0	0	6	
Number of granted trademarks	236	0.708	1.841	0	0	19	
<i>Campaign characteristics</i>							
Amount raised	266	340,271.195	538,619.681	1,026.00	159,242.50	4,818,000.00	
Funding target	257	117,161.012	222,608.554	1,000.00	50,000.00	2,000,000.00	
Ratio of amount raised to funding target	251	0.485	0.302	0.033	0.500	1.471	
Number of investors	223	323.448	343.268	4	198	1982	
Business valuation	197	2,451,861.269	2,523,079.582	310,000.000	1,500,000.000	17,800,000.000	
<i>Financials</i>							
Number of subsequent successful campaigns	236	0.13	0.41	0	0	2	
Exit of the crowd	236	0.034	0.181	0	0	1	8
Ratio of equity to total assets	67	30.283	30.073	-11.521	19.896	99.964	
<i>Duration statistics</i>							
Time at risk in days	236	773.852		1	754	1704	

PANEL C: UK Sample

	UK						
	N	Mean	Std.-dev.	Minimum	Median	Maximum	Yes
<i>Events</i>							
Firm insolvency or liquidation	420	0.081	0.273	0	0	1	34
Number of VC investors	420	0.417	1.171	0	0	12	
Number of BA investors	420	0.198	0.664	0	0	5	
Number of successful campaigns	420	1.214	0.584	1	1	6	
<i>Firm characteristics</i>							
Age of the firm at end of first campaign	420	2.777	2.811	0.000	1.952	18.337	
LLC form with no capital requirements	420	0.000	0.000	0	0	0	0
<i>Management</i>							
Number of senior management	376	3.322	2.076	1	3	12	
Share of female senior management	372	0.174	0.283	0.000	0.000	1.000	
Average age of senior management	371	44.798	9.436	25	45	72	
Age difference of senior management	372	13.151	12.871	0.000	9.000	46.000	
<i>Trademarks and Patents</i>							
Number of filed patents	420	0.074	0.505	0	0	8	
Number of granted patents	420	0.029	0.257	0	0	4	
Number of granted trademarks	420	0.414	1.187	0	0	13	
<i>Campaign characteristics</i>							
Amount raised	512	515,575.025	795,180.625	3,018.82	207,208.86	6,336,332.53	
Funding target	512	2,990,917.905	59,862,536.324	3,031.45	179,200.82	1,354,829,968.84	
Ratio of amount raised to funding target	510	2.270	23.772	0.058	0.823	432.900	
Number of investors	510	206.849	289.744	1	128	2702	
Business valuation	403	3,620,771.782	8,774,515.518	63,549.758	1,250,781.739	85,055,711.491	
<i>Financials</i>							
Number of subsequent successful campaigns	420	0.21	0.58	0	0	5	
Exit of the crowd	420	0.005	0.069	0	0	1	2
Ratio of equity to total assets	360	41.316	49.286	-95.932	50.054	100.000	
<i>Duration statistics</i>							
Time at risk in days	420	576.717		29	503	1741	

Table 2

Regression results on follow-up funding. Standard errors are clustered by firm and appear in parentheses.

***, **, and * indicate statistical significance at the 1%, 5%, and 10% level.

PANEL A

	(1)	(2)	(3)	(4)	(5)
	Cox				
UK firm	-0.520** (0.218)	-1.085*** (0.200)	-0.466** (0.225)	-0.366 (0.266)	-0.352 (0.263)
LLC form with no capital requirements	-0.137 (0.123)	-0.423*** (0.123)	-0.129 (0.129)	-0.035 (0.172)	-0.031 (0.099)
Age of the firm at end of first campaign	-0.106*** (0.037)	-0.111*** (0.035)	-0.119*** (0.033)	-0.156*** (0.059)	-0.125*** (0.041)
Number of senior management		0.345*** (0.047)			
Share of female senior management		-0.063 (0.389)			
Average age of senior management		-0.052*** (0.008)			
Age difference of senior management		-0.005 (0.011)			
Number of filed patents			0.068 (0.149)		
Number of granted patents			-0.233 (0.341)		
Number of granted trademarks			0.108** (0.050)		
Number of subsequent successful campaigns				0.541*** (0.128)	
Exit of the crowd				1.337*** (0.212)	
Total amount of money raised				0.008 (0.015)	
Total amount of funding target				0.033** (0.013)	
Total number of investors				0.003 (0.027)	
Business valuation				-0.003 (0.018)	
Ratio of amount raised to funding target				-1.368** (0.534)	
Number of VC investors					0.193*** (0.046)
Number of BA investors					0.111* (0.057)
Days at risk	425294	363533	425294	350050	425294
No. events	142	134	142	125	142
No. firms	656	577	656	497	656
Pseudo-R-squared	0.011	0.051	0.013	0.052	0.035
Log-likelihood	-837.623	-736.056	-835.806	-680.521	-817.024
Chi-squared	19.359	448.869	25.461	4544.325	55.890

PANEL B

	(6)	(7)	(8)	(9)	(10)	(11)
	Cox		AFT (Exponential)		AFT (Weibull)	
UK firm	-0.773*** (0.278)	-0.567 (0.757)	0.505 (0.314)	0.791* (0.442)	0.829** (0.344)	0.631 (0.990)
LLC form with no capital requirements	-0.221* (0.126)	0.257 (0.691)	0.883*** (0.231)	0.529* (0.314)	0.279* (0.159)	-0.227 (0.976)
Age of the firm at end of first campaign	-0.163*** (0.058)	-0.276*** (0.078)	0.160** (0.079)	0.352*** (0.095)	0.195*** (0.075)	0.361*** (0.128)
Number of senior management	0.229*** (0.043)	0.275*** (0.048)	-0.167* (0.089)	-0.263*** (0.096)	-0.303*** (0.060)	-0.403*** (0.089)
Share of female senior management	0.117 (0.387)	-0.401 (0.474)	-0.177 (0.378)	0.520 (0.542)	-0.153 (0.465)	0.558 (0.652)
Average age of senior management	-0.032*** (0.010)	-0.022 (0.018)	0.156*** (0.011)	0.131*** (0.019)	0.041*** (0.011)	0.036 (0.025)
Age difference of senior management	0.004 (0.008)	-0.003 (0.008)	-0.049*** (0.009)	-0.031*** (0.009)	-0.004 (0.010)	0.006 (0.012)
Number of filed patents	-0.118 (0.180)	-0.102 (0.161)	0.105 (0.197)	0.134 (0.187)	0.145 (0.229)	0.183 (0.220)
Number of granted patents	-0.829 (0.522)	-39.383*** (0.933)	0.999** (0.448)	13.565*** (1.186)	1.032 (0.695)	18.078*** (3.179)
Number of granted trademarks	0.058 (0.064)	0.121 (0.081)	-0.014 (0.063)	0.013 (0.073)	-0.072 (0.077)	-0.137 (0.131)
Number of subsequent successful campaigns	0.335** (0.163)	0.191 (0.183)	-0.102 (0.171)	0.090 (0.211)	-0.333 (0.216)	-0.125 (0.219)
Exit of the crowd	0.157 (0.207)	0.384 (0.491)	0.394 (0.322)	0.697 (0.600)	0.167 (0.288)	0.467 (0.901)
Total amount of money raised	0.025 (0.017)	-0.042 (0.054)	-0.039* (0.020)	-0.001 (0.055)	-0.022 (0.020)	0.044 (0.080)
Total amount of funding target	-0.006 (0.019)	0.069 (0.053)	-0.001 (0.021)	-0.053 (0.057)	-0.006 (0.021)	-0.087 (0.079)
Total number of investors	-0.031 (0.031)	-0.048 (0.085)	0.152*** (0.041)	0.170 (0.108)	0.037 (0.039)	0.073 (0.113)
Business valuation	-0.005 (0.021)	0.002 (0.010)	-0.014 (0.025)	-0.019 (0.012)	0.007 (0.028)	-0.006 (0.015)
Ratio of amount raised to funding target	-1.142* (0.669)	-1.363 (0.888)	3.212*** (0.872)	3.060*** (0.987)	1.649* (0.906)	2.190* (1.313)
Number of VC investors	0.193*** (0.075)	0.180 (0.114)	-0.136 (0.086)	-0.017 (0.138)	-0.205** (0.103)	-0.166 (0.217)
Number of BA investors	0.049 (0.046)	0.340** (0.144)	0.025 (0.033)	-0.157 (0.138)	-0.055 (0.060)	-0.316 (0.258)
Ratio of equity to total assets		-0.001 (0.003)		0.007*** (0.002)		0.001 (0.004)
Constant					5.745*** (0.466)	5.633*** (1.533)
Days at risk	298608	191186	298608	191186	298608	191186
No. events	119	65	119	65	119	65
No. firms	434	287	434	287	434	287
Pseudo-R-squared	0.077	0.108	-	-	-	-
Log-likelihood	-611.102	-302.414	-370.801	-217.951	-332.457	-194.523
Chi-squared	570008.284	208706.350	-	-	8102.096	10578.825

PANEL C

	(12)		(13)		(14)	
	Cox		AFT (Exponential)		AFT (Weibull)	
		Interaction w/ UK firm		Interaction w/ UK firm		Interaction w/ UK firm
UK firm	-2.138** (1.006)		6.484*** (0.645)		2.574* (1.350)	
LLC form with no capital requirements	-0.225 (0.213)		0.650*** (0.244)		0.277 (0.231)	
Age of the firm at end of first campaign	-0.122 (0.090)	-0.118 (0.134)	0.130 (0.138)	0.103 (0.171)	0.136 (0.111)	0.159 (0.171)
Number of senior management	0.003 (0.155)	0.360* (0.184)	0.251 (0.233)	-0.626** (0.249)	-0.037 (0.189)	-0.415** (0.198)
Share of female senior management	0.975* (0.530)	-1.936 (1.241)	-1.100** (0.450)	2.076 (1.288)	-1.220* (0.622)	2.476* (1.476)
Average age of senior management	-0.062*** (0.015)	0.047* (0.025)	0.149*** (0.024)	-0.131*** (0.038)	0.077*** (0.019)	-0.057* (0.034)
Age difference of senior management	0.071 (0.057)	-0.093 (0.057)	-0.126* (0.069)	0.149** (0.068)	-0.090 (0.065)	0.118* (0.065)
Number of filed patents	0.034 (0.381)	-0.570 (0.581)	-0.125 (0.387)	0.686 (0.591)	-0.028 (0.459)	0.701 (0.708)
Number of granted patents	-0.602 (0.493)	-30.008*** (1.015)	0.876 (0.610)	10.809*** (0.926)	0.795 (0.639)	13.840*** (1.086)
Number of granted trademarks	0.029 (0.099)	0.371 (0.295)	-0.001 (0.108)	-0.438 (0.297)	-0.029 (0.133)	-0.473 (0.362)
Number of subsequent successful campaigns	0.792*** (0.155)	-0.708*** (0.207)	-0.510** (0.205)	0.566 (0.406)	-0.770*** (0.189)	0.729** (0.350)
Exit of the crowd	0.963*** (0.135)	-34.955*** (0.843)	-0.566*** (0.179)	15.833*** (0.947)	-0.843*** (0.164)	19.769*** (2.262)
Total amount of money raised	0.100* (0.055)	-0.178** (0.072)	-0.139 (0.109)	0.223* (0.118)	-0.111 (0.071)	0.211** (0.090)
Total amount of funding target	0.198 (0.206)	-0.105 (0.222)	-0.242 (0.223)	0.144 (0.236)	-0.297 (0.229)	0.178 (0.253)
Total number of investors	-0.054 (0.056)	0.025 (0.117)	0.162* (0.096)	-0.143 (0.149)	0.069 (0.067)	-0.036 (0.138)
Business valuation	-0.126 (0.140)	0.134 (0.136)	0.187 (0.240)	-0.197 (0.234)	0.155 (0.182)	-0.166 (0.175)
Ratio of amount raised to funding target	-1.224** (0.598)	-0.580 (1.599)	3.108*** (0.949)	-1.064 (1.700)	1.878*** (0.668)	0.486 (1.937)
Number of VC investors	0.084 (0.058)	0.135 (0.106)	-0.037 (0.038)	-0.140 (0.152)	-0.059 (0.073)	-0.190 (0.179)
Number of BA investors	-0.017 (0.044)	0.306** (0.136)	0.044 (0.072)	-0.289** (0.145)	0.025 (0.054)	-0.383* (0.199)
Constant					4.142*** (0.615)	
Days at risk	298608		298608		298608	
No. events	119		119		119	
No. firms	434		434		434	
Pseudo-R-squared	0.099		-		-	
Log-likelihood	-596.625		-328.555		-318.912	
Chi-squared	203922.704		-		92019.374	

PANEL D

	(15)	(16)		(17)	(18)
		<i>Large Portals</i>			<i>Germany</i>
	Cox	Cox	Interaction w/ UK firm	Cox	Cox
UK firm	-0.936*** (0.289)	-2.436** (1.023)			
LLC form with no capital requirements	-0.230** (0.106)	-0.221 (0.162)		-0.219 (0.208)	-0.205 (0.224)
Age of the firm at end of first campaign	-0.145** (0.060)	-0.087 (0.087)	-0.153 (0.131)	-0.120 (0.091)	-0.115 (0.097)
Number of senior management	0.231*** (0.042)	-0.008 (0.156)	0.370** (0.180)	0.016 (0.166)	-0.009 (0.180)
Share of female senior management	0.053 (0.373)	0.846* (0.473)	-1.808 (1.213)	0.947* (0.545)	0.949* (0.546)
Average age of senior management	-0.034*** (0.010)	-0.069*** (0.020)	0.054* (0.031)	-0.062*** (0.016)	-0.059*** (0.016)
Age difference of senior management	0.004 (0.008)	0.056 (0.059)	-0.079 (0.059)	0.073 (0.059)	0.072 (0.061)
Number of filed patents	-0.136 (0.176)	0.032 (0.382)	-0.567 (0.580)	0.023 (0.388)	0.012 (0.387)
Number of granted patents	-0.849 (0.519)	-0.619 (0.501)	-35.940*** (1.027)	-0.613 (0.473)	-0.609 (0.478)
Number of granted trademarks	0.047 (0.062)	0.017 (0.099)	0.382 (0.298)	0.029 (0.106)	0.039 (0.109)
Number of subsequent successful campaigns	0.326** (0.166)	0.660*** (0.214)	-0.575** (0.282)	0.651*** (0.123)	0.714*** (0.147)
Exit of the crowd	0.171 (0.192)	0.948*** (0.148)	-40.858*** (0.841)	0.829*** (0.132)	0.844*** (0.138)
Total amount of money raised	0.031* (0.017)	0.109* (0.060)	-0.187** (0.076)	0.091 (0.058)	0.092 (0.066)
Total amount of funding target	-0.012 (0.018)	0.395 (0.387)	-0.302 (0.407)	0.249 (0.197)	0.191 (0.215)
Total number of investors	-0.043 (0.033)	-0.065 (0.056)	0.035 (0.118)	-0.048 (0.056)	-0.047 (0.055)
Business valuation	-0.003 (0.020)	-0.148 (0.135)	0.155 (0.131)	-0.122 (0.140)	-0.116 (0.160)
Ratio of amount raised to funding target	-0.985 (0.695)	-1.081** (0.495)	-0.723 (1.550)	-1.292** (0.540)	-1.239** (0.530)
Number of VC investors	0.180** (0.076)	0.074 (0.064)	0.145 (0.108)	0.068 (0.064)	0.074 (0.064)
Number of BA investors	0.042 (0.044)	-0.024 (0.044)	0.314** (0.138)	-0.016 (0.041)	-0.032 (0.039)
Firm never ran successful campaign				-37.368*** (0.805)	
Number of subsequent unsuccessful campaigns					-31.431*** (1.524)
Days at risk	287003	287003		120807	120807
No. events	119	119		69	69
No. firms	416	416		147	147
Pseudo-R-squared	0.078	0.100		0.076	0.074
Log-likelihood	-606.179	-591.568		-288.415	-289.032
Chi-squared	652584.506	201603.305		79442.391	58190.813

Table 3

Regression results on firm survival. Standard errors are clustered by firm and appear in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level.

PANEL A					
	(1)	(2)	(3)	(4)	(5)
	Cox				
UK firm	-0.368 (0.284)	-2.112*** (0.622)	-0.453 (0.281)	-0.210 (0.281)	-0.371 (0.267)
LLC form with no capital requirements	-0.268 (0.393)	-0.428 (0.482)	-0.260 (0.370)	-0.514 (0.497)	-0.266 (0.393)
Age of the firm at end of first campaign	-0.056 (0.038)	-0.032 (0.049)	-0.050 (0.038)	-0.142*** (0.053)	-0.059 (0.036)
Number of senior management		-0.012 (0.088)			
Share of female senior management		0.241 (0.731)			
Average age of senior management		0.015 (0.027)			
Age difference of senior management		-0.011 (0.015)			
Number of filed patents			-0.051 (0.217)		
Number of granted patents			0.128 (0.268)		
Number of granted trademarks			-0.352 (0.265)		
Number of subsequent successful campaigns				-0.835*** (0.296)	
Exit of the crowd				-37.411*** (0.513)	
Total amount of money raised				-0.003 (0.033)	
Total amount of funding target				0.004 (0.014)	
Total number of investors				-0.064 (0.073)	
Business valuation				0.012 (0.012)	
Ratio of amount raised to funding target				-0.188 (0.595)	
Number of VC investors					-0.199** (0.085)
Number of BA investors					0.030 (0.100)
Days at risk	424850	363089	424850	350050	424850
No. failures	77	37	77	67	77
No. firms	656	577	656	497	656
Pseudo-R-squared	0.005	0.074	0.011	0.024	0.007
Log-likelihood	-426.250	-190.714	-423.504	-348.872	-425.225
Chi-squared	2.991	127.807	60.714	16104.134	27.015

PANEL B

	(6)	(7)	(8)	(9)	(10)	(11)
	Cox		AFT (Exponential)		AFT (Weibull)	
UK firm	-2.244*** (0.623)	-2.330** (0.942)	1.669** (0.654)	1.770 (1.419)	1.480*** (0.512)	1.561*** (0.462)
LLC form with no capital requirements	-0.791* (0.436)	-0.387 (0.616)	1.345** (0.548)	1.094 (0.946)	0.557 (0.389)	0.198 (0.454)
Age of the firm at end of first campaign	-0.027 (0.128)	0.109 (0.129)	0.108 (0.219)	0.003 (0.226)	0.011 (0.086)	-0.081 (0.084)
Number of senior management	0.016 (0.204)	-0.069 (0.222)	0.517* (0.314)	0.620 (0.591)	-0.019 (0.141)	0.047 (0.150)
Share of female senior management	-0.014 (0.663)	-2.731* (1.480)	-0.104 (0.814)	2.090 (1.396)	-0.032 (0.446)	1.724 (1.126)
Average age of senior management	-0.005 (0.038)	0.020 (0.062)	0.126*** (0.036)	0.109 (0.078)	0.004 (0.026)	-0.012 (0.046)
Age difference of senior management	0.001 (0.017)	0.007 (0.035)	-0.066*** (0.019)	-0.034 (0.071)	-0.000 (0.011)	-0.004 (0.025)
Number of filed patents	-0.166 (0.412)	-0.504 (0.344)	-0.043 (0.604)	0.011 (0.482)	0.117 (0.264)	0.295 (0.222)
Number of granted patents	0.493 (0.398)	0.949* (0.561)	-0.488 (0.567)	-1.190*** (0.308)	-0.342 (0.224)	-0.726 (0.465)
Number of granted trademarks	-0.218 (0.176)	-0.287 (0.235)	0.201 (0.148)	0.510** (0.237)	0.148 (0.156)	0.222 (0.175)
Number of subsequent successful campaigns	-1.932*** (0.622)	-34.598*** (0.575)	1.407 (1.009)	13.989*** (1.467)	1.393** (0.686)	10.273*** (2.605)
Exit of the crowd	-33.323*** (1.047)	-36.477*** (1.842)	14.331*** (0.984)	17.017*** (2.616)	9.133*** (1.921)	11.031*** (4.268)
Total amount of money raised	-0.037 (0.038)	0.056 (0.123)	0.018 (0.135)	-0.158 (0.297)	0.029 (0.027)	-0.035 (0.086)
Total amount of funding target	0.096 (0.073)	-0.017 (0.165)	-0.118 (0.132)	0.045 (0.242)	-0.070 (0.064)	0.008 (0.113)
Total number of investors	-0.033 (0.050)	-0.093 (0.112)	0.373*** (0.101)	0.377 (0.260)	0.022 (0.035)	0.055 (0.080)
Business valuation	0.029 (0.020)	0.028 (0.023)	-0.058*** (0.021)	-0.057*** (0.021)	-0.022* (0.012)	-0.022 (0.015)
Ratio of amount raised to funding target	-0.341 (0.650)	-0.525 (2.602)	3.549** (1.469)	3.499 (3.789)	0.317 (0.528)	0.448 (1.773)
Number of VC investors	0.039 (0.197)	0.059 (0.201)	-0.113 (0.172)	0.101 (0.184)	-0.008 (0.127)	-0.001 (0.129)
Number of BA investors	0.166 (0.144)	-0.211 (0.912)	-0.094 (0.133)	0.040 (1.252)	-0.127 (0.127)	0.162 (0.659)
Ratio of equity to total assets		0.013 (0.008)		0.002 (0.005)		-0.009 (0.007)
Constant					7.412*** (0.639)	8.406*** (1.494)
Days at risk	298608	191186	298608	191186	298608	191186
No. failures	31	9	31	9	31	9
No. firms	434	287	434	287	434	287
Pseudo-R-squared	0.112	0.198	-	-	-	-
Log-likelihood	-147.373	-36.380	-125.061	-44.064	-102.976	-34.502
Chi-squared	1079082.546	1858738.891	-	-	81496.971	143404.304

PANEL C

	(12)		(13)		(14)	
	Cox		AFT (Exponential)		AFT (Weibull)	
		Interaction w/ UK firm		Interaction w/ UK firm		Interaction w/ UK firm
UK firm	-2.262 (1.697)		9.519*** (2.668)		0.751 (1.915)	
LLC form with no capital requirements	-0.896 (0.564)		1.549** (0.620)		0.677 (0.543)	
Age of the firm at end of first campaign	-0.374* (0.215)	0.572*** (0.100)	0.663** (0.269)	-0.880*** (0.217)	0.242 (0.180)	-0.377*** (0.142)
Number of senior management	-0.035 (0.377)	0.010 (0.279)	0.811 (0.562)	-1.262** (0.534)	-0.036 (0.306)	-0.306 (0.302)
Share of female senior management	0.513 (0.314)	-3.235*** (0.934)	-0.995* (0.559)	2.497*** (0.657)	-0.429** (0.182)	1.418*** (0.494)
Average age of senior management	-0.013 (0.026)	-0.001 (0.109)	0.108*** (0.024)	-0.059 (0.121)	0.010 (0.018)	0.030 (0.095)
Age difference of senior management	0.058 (0.094)	-0.061 (0.147)	-0.106 (0.077)	0.137 (0.125)	-0.023 (0.076)	0.045 (0.120)
Number of filed patents	-0.269 (0.520)		-0.864 (1.316)	16.635*** (2.715)	-0.257 (0.486)	10.372*** (2.845)
Number of granted patents	0.677 (0.588)		-0.438 (1.186)	16.045*** (1.573)	-0.314 (0.586)	10.275*** (1.759)
Number of granted trademarks	-0.453** (0.208)	0.497* (0.284)	0.472 (0.307)	-0.557 (0.497)	0.338 (0.233)	-0.419 (0.398)
Number of subsequent successful campaigns	-1.813** (0.922)		0.645 (1.300)	12.207*** (1.957)	1.150 (0.787)	7.495*** (1.141)
Exit of the crowd			20.177*** (1.403)	-17.452*** (2.630)	13.766*** (2.328)	-11.922*** (2.965)
Total amount of money raised	-0.408 (0.314)	0.473* (0.277)	0.368 (0.544)	-0.627 (0.527)	0.282 (0.232)	-0.441* (0.257)
Total amount of funding target	0.121 (0.931)	-0.142 (0.907)	0.507 (1.843)	0.078 (1.844)	-0.051 (0.774)	0.443 (1.011)
Total number of investors	0.070 (0.178)	-0.221 (0.142)	0.340* (0.189)	0.098 (0.263)	-0.032 (0.116)	0.322 (0.199)
Business valuation	0.477** (0.193)	-0.442** (0.198)	-0.511* (0.294)	0.132 (0.409)	-0.314* (0.175)	0.044 (0.279)
Ratio of amount raised to funding target	-0.070 (0.669)	-0.240 (2.540)	3.204** (1.282)	-3.143 (2.589)	0.207 (0.416)	0.185 (2.102)
Number of VC investors	-0.136 (0.140)		-0.251 (0.185)	16.582*** (4.024)	-0.020 (0.121)	10.868*** (4.024)
Number of BA investors	0.247 (0.165)		-0.254 (0.204)	23.047*** (5.439)	-0.208 (0.162)	16.005*** (5.052)
Constant					7.258*** (0.628)	
Days at risk	298608		298608		298608	
No. failures	31		31		31	
No. firms	434		434		434	
Pseudo-R-squared	0.143		-		-	
Log-likelihood	-142.186		-103.666		-90.063	
Chi-squared	1001152.680		-		27011.420	

PANEL D

	(15)	(16)		(17)	(18)
		<i>Large Portals</i>			<i>Germany</i>
	Cox	Cox	Interaction w/ UK firm	Cox	Cox
UK firm	-2.229*** (0.707)	-1.443 (2.059)			
LLC form with no capital requirements	-0.950** (0.473)	-1.241* (0.695)		-0.973 (0.644)	-0.898 (0.585)
Age of the firm at end of first campaign	-0.027 (0.131)	-0.467* (0.271)	0.664*** (0.138)	-0.358 (0.229)	-0.486* (0.260)
Number of senior management	-0.044 (0.231)	-0.197 (0.632)	0.164 (0.551)	0.043 (0.470)	-0.030 (0.483)
Share of female senior management	0.101 (0.665)	0.678** (0.266)	-3.375*** (1.048)	0.648* (0.368)	0.603* (0.315)
Average age of senior management	0.001 (0.038)	-0.002 (0.031)	-0.012 (0.110)	-0.014 (0.031)	-0.018 (0.028)
Age difference of senior management	0.011 (0.020)	0.100 (0.129)	-0.103 (0.183)	0.037 (0.103)	0.039 (0.104)
Number of filed patents	-0.129 (0.423)	-0.238 (0.512)		0.420 (0.776)	0.467 (0.462)
Number of granted patents	0.567 (0.388)	0.631 (0.702)		0.449 (1.067)	0.415 (0.741)
Number of granted trademarks	-0.237 (0.196)	-0.375 (0.273)	0.417 (0.349)	-0.518* (0.273)	-0.383* (0.223)
Number of subsequent successful campaigns	-1.868*** (0.677)	-2.031** (0.919)		-0.501 (1.231)	-1.322 (1.030)
Exit of the crowd				-37.158*** (1.466)	-40.127*** (1.241)
Total amount of money raised	-0.035 (0.030)	-0.330 (0.265)	0.390* (0.228)	-0.381 (0.281)	-0.535** (0.259)
Total amount of funding target	0.094 (0.067)	0.595 (0.907)	-0.607 (0.902)	-0.621 (1.448)	-0.264 (1.246)
Total number of investors	-0.007 (0.043)	0.128 (0.152)	-0.280** (0.115)	-0.001 (0.181)	0.086 (0.170)
Business valuation	0.026 (0.018)	0.354* (0.183)	-0.319* (0.191)	0.511** (0.202)	0.706*** (0.184)
Ratio of amount raised to funding target	-0.107 (0.802)	0.248 (0.723)	-0.598 (2.552)	-0.334 (0.798)	0.163 (0.647)
Number of VC investors	-0.049 (0.158)	-0.115 (0.155)		0.063 (0.207)	0.076 (0.193)
Number of BA investors	0.210 (0.159)	0.276 (0.214)		0.289 (0.198)	0.227 (0.195)
Firm never ran successful campaign				-37.499*** (1.256)	
Number of subsequent unsuccessful campaigns					-44.081*** (2.306)
Days at risk	287003	287003		120807	120807
No. failures	26	26		26	26
No. firms	416	416		147	147
Pseudo-R-squared	0.108	0.146		0.089	0.104
Log-likelihood	-122.904	-117.621		-104.557	-103.204
Chi-squared	246147.131	101421.567		11715.517	17638.920

Appendix A

List of variables.

Variable	Description	Source
<i>Events</i>		
Firm insolvency or liquidation	Dummy variable equal to 1 if the firm went into insolvency or was liquidated and 0 otherwise.	Unternehmensregister (GER), Companies House (UK)
Number of VC investors	Number of individual VC investors of the firm.	BvD Orbis, BvD Zephyr, Thomson Reuters EIKON, CrunchBase, press releases
Number of BA investors	Number of individual VC investors of the firm.	BvD Orbis, BvD Zephyr, Thomson Reuters EIKON, CrunchBase, press releases
Number of successful campaigns	Number of successful ECF campaigns of the firm.	ECF portal
Number of subsequent unsuccessful campaigns	Number of unsuccessful ECF campaigns of the firm.	ECF portal (only GER)
<i>Firm characteristics</i>		
UK firm	Dummy variable equal to 1 if the firm ran ECF campaign in the UK and 0 otherwise.	ECF portal
Age of the firm at end of first campaign	Age of the firm at the end of first ECF campaign.	Foundation: BvD Orbis Age: Calculation by the authors
Legal form with no capital requirements	Dummy variable equal to 1 if the firm's legal form does not have capital requirements and 0 otherwise.	Unternehmensregister (GER), Companies House (UK)
<i>Management</i>		
Number of senior management	The number of senior management of the firm.	BvD Orbis
Share of female senior management	The share of female senior management of the firm.	Gender: BvD Orbis Share: Calculation by the authors
Average age of senior management	The average age of senior management of the firm.	Age: BvD Orbis Share: Calculation by the authors
Age difference of senior management	Age difference between the oldest and the youngest senior management of the firm.	Age: BvD Orbis Share: Calculation by the authors
<i>Trademarks and patents</i>		
Number of filled patents	The number of filled patents by the firm.	BvD Orbis, PATSTAT
Number of granted patents	The number of granted patents owned by the firm.	BvD Orbis, PATSTAT
Number of trademarks	The number of trademarks owned by the firm.	BvD Orbis
<i>Financials</i>		
Number of subsequent successful campaigns	The number of subsequent successful campaigns after the first successful campaign of the firm.	ECF portal
Exit of the crowd	Dummy variable equal to 1 if the crowd exited the firm and 0 otherwise.	Press release, ECF portal
Total amount of money raised	The total amount of money raised by ECF.	ECF portal
Total amount of funding target	The total amount of funding target.	ECF portal
Total number of investors	The total number of ECF investors of the firm.	ECF portal
Business valuation	The pre-money valuation of the firm.	ECF portal
Ratio of funding to funding target	The ratio of funding to funding target.	Calculation by the authors
Ratio of equity to total assets	The ratio of firm's balance sheet equity to total assets.	BvD Orbis