

The role of platforms in equity crowdfunding campaigns

Abstract

Equity crowdfunding platforms have an important role in the selection procedure of crowdfunding campaigns. This impacts on the success of campaigns, in terms of issuing firms raising fresh equity. The main purpose of this paper is to examine the role of platforms' features on the performance of equity crowdfunding campaigns. We improve on existing research because we consider the features of platforms' networks of partners. Network features are considered both in terms of the number of different partners in the network and of their diversity. The study is based on original data which comprise the entire Italian equity crowdfunding market: 233 campaigns launched by all Italian equity crowdfunding platforms between 2013 and 2018. The role played by platforms and their networks have important consequences on campaign performance: network diversity has a significant influence on the probability of campaign success and on how much equity is raised. Also, some characteristics of issuing companies impact on crowdfunding campaigns performances, such as a large number of shareholders and the presence of industrial partners among them; while features specific to the campaign itself seem to play a minor role. Our results have practical implications for issuing companies, investors and platforms as well.

Keywords Equity Crowdfunding, Crowdfunding platform, Entrepreneurial finance, Crowdfunding success, Platform networks

1. Introduction

Over the last few decades, the number of intermediaries and investment methods in the entrepreneurial finance market has been expanding rapidly: venture capitalists, business angels, and equity crowdfunding platforms (CFPs), are becoming crucial for supporting start-ups in the seed and early stage segments. CFPs are innovative fintech market venues which can provide fast and cheap access to finance (Cai, 2018; Lee and Shin, 2018), simplify various financial processes through digitalisation (Belleflamme et al., 2015; Shane and Nicolaou, 2017).

CFPs intermediate between investors and fundraisers, generating a trustful environment for transactions (Burkett, 2012; Belleflamme et al., 2015), facilitating the transfer of funds and information; they are the first screening stage for a company wishing to run an equity crowdfunding campaign (Bouncken et al., 2015; Colombo et al., 2015). Their main objective is to maximize the number of successful projects by attracting a large number of investors, proponents and of high-quality projects, reduce rationing and frauds' risk and facilitate an efficient matching between ideas and capital (Agrawal et al., 2014).

Before a campaign is launched, CFPs produce hard and soft information and operate a series of checks and assessments to determine the suitability of the fundraiser and of its project. Such informative and assessment process, the nature of which varies from platform to platform, may significantly affect success chances of campaigns. High success rates may relate, among other factors, to CFPs' selection abilities (Ziegler et al., 2018).

Once the campaign rolls out, CFPs may give important support by providing access to financing partners or to networks involving institutional and quasi-professional investors (Agrawal et al., 2016); also, they may help pulling in marginal investors when a campaign falls short of the threshold to become a success (Belleflamme et al., 2015).

In order to understand the role of platforms as a determinant of the success of equity crowdfunding campaigns, our study is focused on platforms' features which may be related to selection ability and to the effectiveness of campaigns. The main research question that we address is: *do platform characteristics influence the success of campaigns and, if so, to what extent?* In particular, about CFP characteristics, the composition of CFPs networks is relatively less-studied phenomena and it provides an intriguing context for analyse it as potential success factors.

We believe that our approach improves on the existing literature for two reasons. First, former studies mainly focused on project success considering aspects related to companies (Ahlers et al. 2015; Lukkarinen et al., 2016), founders' profiles – such as gender, social capital and intellectual background (Butticé et al., 2017; Colombo et al., 2015; Piva and Lamastra, 2017; Skirnevskiy et al., 2017) – and campaigns' characteristics (Vismara 2016a; Vismara 2016b). Platforms' features have received little attention. In our study we consider CFPs' networks in terms of dimension – number of partners involved in the platform's network – and of diversity – different types of network members and their diversification.

The second improvement is that, while former studies mainly consider a single platform at a time, our research is conducted on an original data set composed of 233 projects

– funded and not funded – that were launched in Italy from 2013 to 2018 by ten different platforms which were active on the market over this period. This allows us to explicitly account for the differences among platforms.

Our study highlights the importance of the role of platforms' network diversity for campaigns' success. CFPs network diversity contributes to explaining the probability of success and the amount of funds raised. Also, the presence of industrial shareholders play a strong positive effect.

Our work considers and measures the role of platforms in contributing to the success of campaigns and pinpoints the importance of platforms' network' diversity in the selection procedure. Platform's network is considered not only in its size, but also in its composition. This new perspective significantly adds to the existing literature, as this subject has only been marginally explored before. Furthermore, we consider several platforms operating in the same market, while previous scholars focused only on one platform at a time. Our findings are relevant both for equity crowdfunding platforms and for entrepreneurs, because understanding campaign success factors could offer a practical contribution to development of the market.

The remainder of this paper is organized as follows. In Section 2, we discuss the literature and the research hypothesis. Section 3 presents the data, the sample and the method. Section 4 explains our empirical results. Section 5 discusses and concludes the implications of our findings.

2. Prior literature and hypotheses development

The current development of CFPs in the alternative finance market is the result of technological change, particularly of the dramatic decline in the cost of bringing new software products to the market and to the breakdown of the traditional venture capital investment model. CFPs could be considered as a structural innovation, making space for new markets and enhancing the fragility of the traditional financial channels for small businesses (Culkin et al., 2016; Shane and Nicolaou, 2017).

About CFPs activities and their role in the financing process, platforms act as an intermediary between a cohort of funders and a fundraiser, facilitating the transfer of funds between the two, and it could be the first selection stage for a company that wish to run a crowdfunding campaign. CFPs exhibit positive cross-group external effects between funders and fundraisers creating a two-sided platform market. Funders tend to prefer platforms with a larger number of campaigns and thus with a larger number of fundraisers, as this increases their choice about which project to fund (Belleflamme et al. 2015). From the investors' perspective, CFPs facilitate the transaction by providing a standardised investment contract, settling payments and enabling investors to learn about investment opportunities and to expand the addressable market for early-stage capital (Agrawal et al., 2015; Belleflamme et al., 2015; Agrawal et al., 2016). CFPs themselves act as “network orchestrators” bringing together start-ups and potential investors (Löher, 2017) so they match the riskiness of start-ups and the risk appetite of investors, improving the development of differentiation in the context of CFPs competition and reducing information asymmetries between equity issuers and investors (Löher, 2017; Gal-or et al., 2018; Brown et al., 2018). Lehner and Harrer (2018) apply the ecosystem perspective to CFP activities considering it as a focal actors in larger networks composed of investors, ventures and other financial providers. As a focal actor, CFP increases the entire system value: signalling innovative companies to the market through the campaign, giving consulting and expert services to aspiring ventures, linking investors and ventures with communication tools, attracting different group of investors, and working with authorities to enhance the current crowdfunding legislation. In the financial intermediary role, CFPs offers various types of capital to the ventures coming from different types of investors, and through its expert role, consulting services and expert rounds.

CFPs are a very recent subjects in crowdfunding studies. Currently, researchers are focusing on describing platforms' markets and activities and, to the best of our knowledge, almost all research about crowdfunding success concentrates on only one platform at a time, (Mochkabadi and Volkmann, 2018) and do not consider CFPs' characteristics as determinants of campaign success. Closely related to campaign success, some scholars have examined how CFPs influence investors' decisions. Hornuf and Schwienbacher (2018) study the impact of different mechanisms – low minimum ticket, pooled investment scheme and profit-participating loans – on crowd participation and amount raised in the German market. Smaller investment tickets, pooled investments, and the use of profit-participating loans attract a larger crowd and raise more money on equity CFPs. Rossi and Vismara (2018) focus their attention on the services provided by 127 CFPs in four different European countries to understand whether the services offered have an impact on the annual number of successful campaigns: a higher number of post campaign services offered by platforms increases the

annual number of successful campaigns, while the number of pre-launch and ongoing campaign services does not have a significant impact. This study only considers platform-business model related aspects; platform services are not combined with project and company characteristics. Also, the age and location of platforms are important aspects in relation to the number of successful campaigns: elder platforms with less competition in the same region and located in the financial centers of their respective countries achieve the highest success. For example, equity CFPs based in London and the South East, can take advantage of a “halo effect”, mobilizing the material-technological knowledge that has been built up in these areas and the high level of involvement of venture capital investors in high-tech start-ups (Langley, 2016).

With the scope of determine platform’s characteristics that influence campaign success, our study focuses on the equity-based model and considers a large number of platforms operating in the same country. Among the platform’s characteristics we consider platform’s network composed of partners that operate in the project selection procedure and in the platform management.

2.1 Hypotheses development

Crowdfunding generates a dense web of network effects that CFPs try to manage for creating value for themselves, investors and entrepreneurs involved in crowdfunding investment. In this term CFPs act as “network orchestrators” bringing together enterprises and potential investors (Maier, 2016; Löher 2017; Ordanini et al. 2011). CFPs increase equity crowdfunding system value through direct and indirect network externalities also contributing to create a unique selling proposition and to build a more sustainable business model (Lehner and Harrer, 2018). The success of CFPs seems strongly related on how network effects emerge and are managed inside and outside it. CFP generates a platform-wide network effects that allow it to move up the learning curve and to improve its operations and services, attracting new investors (Belleflamme et al., 2018). Network effects on CFP emerge at different level. At first within a particular project where past investors influence the investment decision of the new ones (Zhang and Liu, 2012; Vismara 2016b; Kuppuswamy and Bayus, 2017). Second, a network effect is also present across projects: more investors makes the platform more attractive to entrepreneurs and more active investors attract more entrepreneurs on the platform (Belleflamme et al., 2018). Third, also CFPs themselves have a network that interact both with investors and proponents. CFPs networks operate especially (i) in the selection procedure of qualified ventures that could match the interests of potential investors and (ii) in the due diligence processes for producing information and signals about the quality of submitted projects to the market (Belleflamme et al., 2015; Maier, 2016; Zhang et al., 2018; Bessiere et. al, 2018). Just as business angels collect investment proposals from their informal or professional networks – such as venture capitalists, banks, and investment clubs (Brettel 2003; Croce et al., 2017) – CFPs’ selection procedures also have major similarities with the practices of established early-stage investors that involve their personal network. Salomon (2016) reveals that the platforms grounds their selection on the “social proof principle”, where many different stakeholders (*e.g.* industry experts and professional investors) evaluate start-ups according to collective judgments platform preselection procedure is regarded as one of

CFP significant success factor (Löher, 2016; Yang et al., 2016). Another selection strategy for CFPs consists in bringing sophisticated investors on their networks (*e.g.* venture capitalists, business angels, and institutional investors); such investors have significant capability and experience to assess the reliability and success chances of proposed campaigns (Belleflamme et al., 2015). Loher (2017), drawing on 21 in-depth interviews that investigate the processes and activities of nine German platforms, shows that the deals they select derive from (1) direct applications, without a prior relationship between the venture and the platform; (2) network applications, deals suggested by (third) intermediaries (actors) such as universities, incubators, BAs, BA networks, venture capitalists or banks; and (3) deals that are generated *via* active search. Platforms consider the deals referred (generated, engendered or referred to) by their networks to be superior. Networks can also enhance a platform's reputation and legitimacy and may thus serve as a signal of quality for both companies and investors (Baum & Silverman, 2004; Hoang & Antoncic, 2003; Stuart et al., 1999).

For these reasons, we hypothesize that platforms with a large network influence campaign success. The larger the number of this kind of intermediaries, the greater the probability that campaigns will be successful.

Hypothesis 1: The size of a platform network improves campaign success.

Furthermore, since we believe that size by itself does not exhaust potentially important network characteristics, we consider also network diversity. Network diversity is the combination of two features: (1) Variety, which is commonly defined in the economic, social and statistical sciences as the number of different types of members that are represented in a given network and (2) Balance, which is the extent of a network diversification (versus specialization) across its members. (Stirling, 1998; Leydesdorff, 2018). In the economic literature, diversity is commonly associated with positive organizational performance, since it impacts group dynamics, improves group decision-making and generates a greater knowledge base as well as creativity, thus fostering competitive advantage (Murray, 1989; Watson et al., 1993; Siciliano, 1996; Watson et al., 1998; Kilduff et al., 2000; Timmerman, 2000). As for CFPs, heterogeneous networks may contribute to identify opportunities but also to implement a better screening and selection procedure of the projects.

Hypothesis 2: The diversity of a platform's network improves campaign success.

3 Data and Method

In this section we describe our sample and the variables that we use in our analyses of campaign success. To better set the context of our study, we also provide sketch of the evolution of the equity crowdfunding market from 2014 to 2018.

3.1 The sample

In this paper, we focus on the Italian equity crowdfunding market. We collected data on all equity crowdfunding campaigns launched in Italy from 2014 to 2018, constantly monitoring campaigns published on all Italian platforms. Thus, our dataset is unique and provides an up-to-date picture of the Italian equity crowdfunding market. The effective sample for our analyses includes 233 campaigns, funded and not funded, out of a total of 237 that were launched from 2014 to 2018 – we dropped two campaigns which were proposed by private equity funds and two more which turned out to be influential outliers in regression analyses.

The platforms that belong to our sample are 10 out of a total of 15 incumbents in one or more years of that period. Since year 2013, the origin of the equity crowdfunding market in Italy, 28 platforms have been authorized but only 17 operated in the market, with just 15 still working by the end of year 2018.

The number of single company issuers is 169 and their characteristics vary widely¹. Consistent with the evolution of the Italian legislation, 151 of the issuers are start-ups, 14 are innovative SMEs and 4 are Special Purpose Acquisition Companies². On average, when companies decide to run a crowdfunding campaign, they are relatively young: the average age from the establishment of the business is 2.4 years.

3.2 The evolution of the Italian equity crowdfunding market

Equity crowdfunding platforms began to operate in Italy in 2013, after a law was introduced in 2012 which allowed innovative start-ups to raise capital through this channel. Since then, there were two important revisions of the Italian legislation, in 2015 and 2017, that have widened the scope of firms that are allowed to raise equity capital through this channel. First, in 2015 innovative SMEs were let in; then, in 2017, access to equity crowdfunding was extended to all Italian firms established as incorporated companies. From our sample, it is possible to identify three distinct phases of evolution of the Italian equity crowdfunding market from 2014 onwards (Figure 1 and Table 1 on next page).

Phase 1. Early start: years 2014 and 2015. A few platforms were operating on the market. They launched 21 campaigns involving 20 firms. Back then, success rates were quite low (50 percent or less) and fundraising was below expectations (less than stated targets, totalling about one million euro per year); from 2014 to 2015, the relative success rate and the average

¹ Five issuers have done more than one campaign.

² Italy has been the first country to regulate equity crowdfunding investment and CFPs' activities in Europe. According to the Italian Consolidated Law on Banking (Legislative Decree no. 58 of 24 February 1998) only authorized entities can engage in crowdfunding. These are banks, investment companies and platform managers specifically authorized by an registered at the public authority responsible for regulating the Italian financial markets – Commissione Nazionale per le Società e la Borsa (Consob).

of funds raised declined sharply (from 83 to 67 percent and from 169 to 73 thousand euro, respectively).

Figure 1

Evolution of the Italian equity crowdfunding market from 2014 to 2018

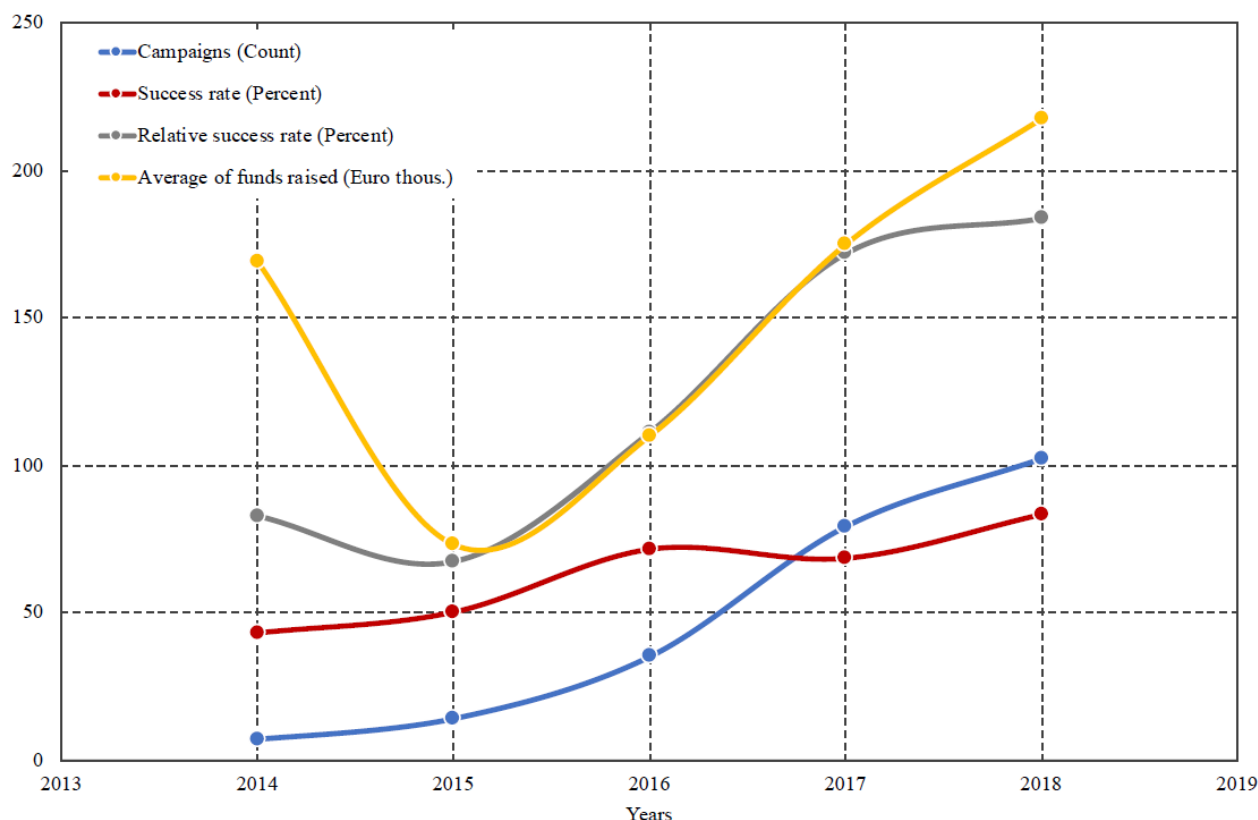


Table 1

Stocks and flows on the Italian equity crowdfunding market from 2014 to 2018

Year	Active platforms (Count)	Equity issuers (Count)	Campaigns (Count)		Success Rate (Percent)	Relative Success (Percent)	Funds Raised (Euro thous.)	
			Launched	Successful			Total	Average
2014	2	7	7	3	42.9	82.5	1,181	168.8
2015	5	13	14	7	50.0	67.0	1,021	72.9
2016	8	35	35	25	71.4	110.9	3,841	109.7
2017	9	78	79	54	68.4	171.7	13,798	174.7
2018	8	100	102	85	83.3	183.7	22,161	217.3
Total	10	233	237	174	73.4	615.8	42,002	177.2

Notes: Success rate is the ratio of campaigns that reached their fundraising targets to all campaigns. Relative success rate is the ratio of total funds raised to the total of fundraising targets, calculated on the subset of 216 campaigns that had a fundraising target. The average of funds raised is calculated on the total number of campaigns.

Phase 2. Take off: years 2016 and 2017. After a tentative start, the market gained momentum. The number of active platforms doubled and the number of firms that tried to tap the market increased fivefold (from 13 to 78). Success rates also grew, from 50 to about 70 percent when achieving fundraising targets is considered, and from 67 to 172 percent when capital raised is benchmarked against stated targets in relative terms. Total funds raised did grow from about

one million euro to slightly less than 14 million; average funds raised did increase from 73 to about 175 thousand euro.

Phase 3. The current phase: year 2018. During 2018, the growth of the market continued almost at the same rate that was observed during Phase 2. The number of firms joining it grew to 100, while the number of platforms seemed to stabilize. Success rates increased and capital raised also increased, but not to the same extent they did in Phase 2.

3.3 Description of variables

The three main variables of interest in our study are (1) the amount of capital raised at the end of the campaign, (2) whether this exceeded the threshold set by the issuer for successfully closing the campaign, and (3) the ratio of capital raised to the maximum target set by the issuer. These variables are meant to represent the success of crowdfunding campaigns from different points of view³.

The explanatory variables we focus on belong to three conceptual classes: (1) platform features, (2) features of the issuing company, and (3) characteristics of the campaign. Variables that pertain to platforms' networks, that are our main focus, belong to the first group.

- a) Size of the network is the number of partners linked with the platform.
- b) Network variety and balance: these variables are meant to jointly represent the diversity of a network. Variety is the number of different types of members that are represented in a given network. The key word in this definition that must be understood is "represent", since it points to two different aspects of diversity: "types richness" and "types evenness". Richness is a simple count of types and evenness quantifies how equal is the abundance of network members across types. Diversity increases with richness and evenness, which together make what is commonly called 'dual concept diversity' in the literature (Stirling, 1998; Rousseau et al., 1999). Following Nijssen et al. (1998) and Leydesdorff (2018), we have chosen to measure richness with relative variety and evenness with the Gini coefficient.

We identified ten different types of partners; then, for each campaign, we have counted the number of partners that belong to each type for the platform where the campaign was launched⁴. Let $i = 1, 2, \dots, 10$ be the type indicator and, for a given platform, let $n(i)$ be the number of partners that belong to type i , so that the total number of partners is:

$$N = \sum_{i=1}^{10} n(i)$$

³ This approach follows prior literature on campaign success (Ahlers et al., 2015; Li et al., 2016; Lukkarinen et al., 2016; Vismara, 2016a; Vismara, 2016b; Mamonov et al., 2017; Löher et al., 2018; Mamonov and Malaga, 2018; Piva and Lamastra, 2018).

⁴ Namely: Banks, Investment funds, Firms, Associations, Agencies, Syndicates, Universities, Advisors, Incubators and Other, which is a minor residual class comprising heterogeneous partners that provide various business-related non-financial services.

Variety is defined as the number of types whom partners of a platform belong to, divided by ten (*i.e.* the total number of possible types) and expressed as a percentage:

$$Variety = \sum_{i=1}^{10} \frac{I(n(i) \neq 0)}{10} \times 100$$

where $I(\bullet)$ is the indicator function. The closer is Variety to a hundred, the richer a platform is. Balance is defined as the Gini coefficient of a platform, expressed in the [0, 100] scale:

$$Balance = \frac{\sum_{i=1}^{10} \sum_{j=1}^{10} |n(i) - n(j)|}{20 \sum_{i=1}^{10} n(i)} \times 100$$

The closer is Balance to a hundred, the more diversified a platform is, while Balance is close to zero for platforms with most partners concentrated on few types.

There is a last platform-related variable, which we add as a control:

- c) Track Record: is the number of campaigns developed by the platforms since its beginning. This variable represents the platform's level of expertise and presence on the market.

The second group of variables pertains to characteristics of the issuing company.

- d) Geographical distance: this variable is meant to represent the spatial distance between an issuing firm and the platform on which its campaign is launched. We calculated this variable using the table of driving route distances between Italian province capitals published by the Italian Ministry of Transport (Ministero dei Trasporti, 1982) and proxying platforms' and firms' locations by the capitals of the province where their registered offices are located⁵.

We include this control variable is to account for possible factors influencing success that are related to spatial proximity. As pointed out by Borello et al. (2015), Langley (2016) and Zhang et al. (2018) proximity may improve screening and reduce the costs that platform bear for project selection, such as those of searching potentially successful firms and conducting due diligence.

- e) Number of incumbent shareholders: as it relates to the governance of the issuing company.
- f) Size of the company board: former studies point out that campaign success is linked to the size and composition of the board (Colombo et al. 2015; Vismara, 2016a Skirnevskiy, 2017; Buttice et al., 2017). As argued by Baum and Silverman (2004), larger management teams are not only likely to possess higher human capital but may also have

⁵ As the table does not provide distances between provinces that are not connected by land routes (*i.e.* provinces of Sicily and Sardinia with provinces located outside the island) and between provinces that were established after year 1982, we used ViaMichelin route planner as a backup source of data (ViaMichelin, 2019), manually retrieving any distance that was missing from the Ministerial table from it.

more connections with potential investors. The number of members was positively correlated with campaign outcome, suggesting that outside investors may perceive this as a positive signal of firms, ability to cope with market uncertainty (Ahlers et al., 2015; Vismara, 2016b; Piva and Lamastra, 2017).

- g) Presence of industrial shareholders: by “industrial” we mean shareholders that have specific competence, skills and experience on the enterprise or on the investment project for which equity funding sought for. When this is the case, investors may gain confidence in committing funds to the campaign (Courtney et al., 2017).

Table 2
Sample descriptive statistics

Variables (Measure)	Minimum	Quarter I	Median	Mean	Quarter III	Maximum
<i>Response variables</i>						
Capital raised (Euro)	0	53,092	131,105	175,839	238,500	1,250,000
Success (Binary)	0	0	1	0.730	1	1
Relative success (Percent)	0	67	142	1,168	114,110	238,500
<i>Platform features</i>						
Size (Count)	2	12	21	22	25	49
Variety (Index, 0 to 100)	10	50	70	60	70	80
Balance (Index, 0 to 100)	0	59	75	68	83	84
Track record (Count)	1	8	17	20	30	56
<i>Issuer features</i>						
Geographical distance (Km)	0	50	171	299	434	1,570
Shareholders (Count)	1	3	4	11	8	167
Board members (Count)	1	1	2	2	3	7
Industrial shareholders (Binary)	0	0	1	0.712	1	1
<i>Campaign features</i>						
Business angels (Binary)	0	0	1	0.528	1	1
Prize for subscription (Binary)	0	1	1	0.854	1	1
Equity retention (Percent)	0	3	7	20	17	384
Fork width (Percent)	0	50	60	56	73	100
Maximum target (Euro)	45,000	150,000	300,000	338,055	400,000	4,500,000
Minimum investment (Euro)	96	250	450	711	500	19,999
Share premium (Euro)	0	0	0	0.5	0	19
Take-it-all (Binary)	0	0	0	0.094	0	1

Note: Statistics on 233 campaigns launched from year 2014 to year 2018.

The last set of variables has to do with campaign-specific features. Some aspects of a campaign profile are likely to influence its success, because may provide signals that reduce

information asymmetries between ventures and investors; they may also play a significant role in determining investors' willingness to pay (Hornuf and Neuenkirch, 2017).

- h) Presence of business angels: according to previous researchers, the presence of a business angel is an effective signal for retail investors that could influence their participation (Ahlers et al., 2015). Indeed, Kim and Viswanathan, (2013) show that less experienced investors are strongly influenced by the investment decisions of experts.
- i) Prize for subscription: if the campaign offers some kind of gift or reward to investors who subscribe equity capital in order to entice them to participate.
- j) Equity retention: the ratio of the issuer company's equity before the campaign was launched to the maximum equity it would have had if the campaign was finalized. Signalling theory (Leland and Pyle, 1977) indicates the manager's choice of raising equity as a negative signal for investors, since firms opportunistically choose to raise equity when managers know their shares are overvalued.
- k) Fork width: the range of maximum to minimum fundraising thresholds, expressed in percentage terms relative to the higher end of the range.
- l) Maximum target: the maximum funds that the issuer was willing to accept before closing subscriptions.
- m) Minimum investment: the minimum value of capital subscribed which an investor should have accepted to join the campaign; if none was set by the issuer, this equals the value of one equity capital share.
- n) The share premium account is the difference between the value at which the shares were issued by the company and their face value.
- o) Take-it-all: the campaign is finalized provided that any new equity capital is raised, as opposed to cases when positively closing the campaign is tied to raising a minimum amount of capital.

We display descriptive statistics of all our variable in Table 2.

3.4 Methods

We addressed our research hypotheses by estimating three different regression models:

Model 1: Linear regression of the natural logarithm of capital raised by each campaign;

Model 2: Linear regression of the natural logarithm of the ratio of capital raised to the stated maximum fundraising target by each campaign;

Model 3: Logistic regression models of whether or not capital raised met the stated fundraising target by each campaign.

The sample, explanatory and control variables of Models 1 and 3 are those listed in the previous subsections. Model 2 is slightly different, since relative success is only meaningful for the subset of campaigns which set a maximum target. Therefore, the sample of Model 2 is made only of "All or nothing" campaigns; these are about 91% of the complete sample, for a

total of 211 campaigns. As a consequence, we dropped the “Take-it-all” variable, which is meaningless in this setting. Furthermore, since the response variable’s denominator is the maximum fundraising target and because this directly enters in the definition of “Fork width”, we drop this variable and “Maximum target” itself to avoid any spurious correlation biasing our analyses.

For each model, we estimated four versions, which differ by the sets of right-hand-side variables that we include: in version A only platform features appear, in version B only issuer features appear, in version C only campaign features appear and, finally, in version D all features are included simultaneously. This approach led us to estimate twelve different regressions.

We used the R environment for all computations (R Development Core Team, 2008). Linear regressions coefficients were estimated by ordinary least squares, with heteroscedasticity-robust standard errors calculated through Long and Ervin (2000) sandwich estimator. Logistic regressions were estimated by maximum-likelihood via the Newton-Raphson numerical algorithm based on Fisher’s scores (Greene, 2000). Besides logit coefficients, we computed average partial effects (APE) for all features, their standard errors and p- values with package ‘margins’ (Leaper 2018); this is because APEs make it easier to evaluate the magnitude of features’ effects on success probabilities (Wooldridge, 2009).

For all regression models, we computed appropriate goodness of fit measures: adjusted R-squared for linear regressions and Akaike Information Criteria (AIC) for logistic regressions. Both measures take into account the regression’s degrees of freedom, with penalties that tend to favour models with fewer regressors⁶. Both measures are useful only in relative terms, that is for comparing two models, and shall not be interpreted in absolute terms. Finally, we calculated Wald test statistics against null models (*i.e.* models which have only a constant as regressor) as a standard way to evaluate the overall statistical significance of regressions.

⁶ Please notice that while the higher the adjusted R-squared is, the better, the opposite is true for AIC, as a low AIC value is better than a high one: this is because we follow the convention of reporting unsigned AICs.

4. Results

We start this section by comparing the full version (D) of each model. Estimation results are in Table 3 and we comment them by sets of variables – that is, by rows. When appropriate, we refer results from different model versions, which we show in the Appendix at the end of paper to avoid cluttering the main text.

The first strong result is that platform network’s size is not statistically significant in any models, a fact that leads us not to reject Hypothesis 1. Therefore, we cannot claim that the size of platform network has a positive influence on success – indeed, in Model 2 the sign of the coefficient is negative. We notice that the only instance where this variable is significant is in Model 1.A (meaning version A of Model 1); there, the coefficient is quite high and implies that, on average, when the number of partners doubles expected fundraising increases by almost 1.75 times.

Variables (Measure)	1. Capital raised (Log of euro)			2. Campaign relative success (Log of Percent)			3. Campaign success (Binary)			
	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value	Coefficient	Estimate	Standard Error	P-value
<i>Platform features</i>										
Size (Log of count)	0.900	0.754	0.183	-0.463	4.080	0.556	0.312	0.005	0.011	0.654
Variety (Index, 0 to 100)	0.313	0.150	0.009	0.232	0.782	0.033	0.312	0.044	0.019	0.022
Variety ²	-0.003	0.001	> 0.000	-0.002	0.108	0.016	-0.003	0.000	0.000	0.004
Balance (Index, 0 to 100)	0.079	0.034	0.013	-0.015	0.001	0.735	-0.001	0.000	0.007	0.953
Track record (Log of count)	-0.012	0.251	0.952	-0.023	0.216	0.279	-0.132	-0.003	0.005	0.568
<i>Issuer features</i>										
Geographical distance (Km)	0.071	0.082	0.273	0.065	0.054	0.228	0.078	0.003	0.003	0.375
Shareholders (Count)	0.008	0.005	0.272	0.018	0.007	0.008	0.030	0.004	0.003	0.174
Board members (Count)	0.093	0.093	0.401	0.058	0.079	0.462	0.060	0.009	0.021	0.652
Industrial shareholders (Binary)	0.913	0.285	0.011	0.863	0.306	0.005	0.706	0.104	0.060	0.085
<i>Campaign features</i>										
Business angels (Binary)	0.228	0.350	0.480	0.263	0.239	0.273	0.271	0.032	0.056	0.570
Prize for subscription (Binary)	0.669	0.488	0.151	0.137	0.419	0.744	1.520	0.180	0.072	0.012
Equity retention (Log of percent)	0.139	0.189	0.486	0.030	0.096	0.751	0.164	0.007	0.005	0.160
Fork width (Percent)	0.004	0.010	0.687	–	–	–	0.027	0.004	0.002	0.019
Maximum target (Log of euro)	0.083	0.332	0.750	–	–	–	-0.686	-0.001	0.000	0.026
Minimum investment (Log of euro)	0.389	0.192	0.082	0.030	0.232	0.899	0.340	0.000	0.000	0.375
Share premium (Log of euro)	-0.070	0.150	0.620	0.013	0.027	0.619	-0.060	0.015	0.025	0.553
Take-it-all (Binary)	0.613	1.070	0.442	–	–	–	-0.966	-0.127	0.091	0.163

Notes: Estimates are the average partial effects. Effects of explanatory variables with p-values of 10 percent or less are typed as boldface. Linear regressions – models 1 and 2 – were estimated by ordinary least squares, with heteroscedasticity-robust standard errors (Long and Ervin, 2000). Model 3 was estimated by maximum likelihood and fitted with Fisher’s scoring algorithm⁶ for this model, regression coefficients are displayed to the left of estimates. The sample size is 233 cases for models 1 and 3, and is 211 cases for model 2.

The second strong result is that we have strong evidence that diversity of platform network diversity is a critical factor for capital raising and for campaign success – either relative or absolute. Variety is statistically significant across all models and all versions where it appears. Capital raised (Model 1) increases with variety over the zero-to-fifty range and then declines, so that null variety (the index equals zero) and full variety (the index equals a hundred) have approximately the same impact; at the sample average, equal to 60, the

differential impact on fundraising is about 8 times larger than at index equal to 10. The effect of variety on relative success (Model 2) and on the probability of success (Model 3) are also positive over the entire range of the index (*i.e.* from 0 to 100); in the latter case, the impact of variety reaches its maximum values in the range from 20 to 80, where it is almost constant. These results suggest that having different types partners in a platform network strongly enhances campaign success, but also that too few or too many of them are suboptimal.

The balance variable, which represents diversification across partners types positively affects capital raised, but it is not a determinant for absolute or relative success. Model 1 is the only model where balance is statistically significant: a ten-points increase in balance increases expected fundraising by about 80 percent.

We finally notice that a platform's track record does not have any significant impact either on campaign success or on fundraising.

Overall, these results allow us to strongly reject Hypothesis 2 and to provide evidence that network features are important factors of equity crowdfunding success. In particular, the variety of partners in a platform's network is of paramount significance; we believe that this is because it relates to the ability of platforms to select and to offer to the market projects that are perceived by investors as potentially successful.

When we consider issuers' features, the only significant aspects for campaign success pertain to the number and profile of shareholders; the first helps raising more equity capital and to improve relative success (models 1 and 2), while the second is a significant driver in all instances. The presence of incumbent industrial shareholders almost doubles the amount of equity raised and increases absolute success by 70 percent and relative success by 86 percent (models 2 and 3).

The number of board members at the time the campaign was launched is not statistically significant when jointly considered with all other variables; on the other hand, we notice that it is so in models 1.B and 3.B – where explanatory variables are just issuer's features. This suggests that the size of the board may be related to the choice of the platform by the issuing company or to the campaign design; we do not delve into this any longer, but these results suggest that the issue may deserve further investigation in future research.

Finally, geographical distance between platform and issuer is never significant. This provides evidence against the claim that proximity delivers informative advantage or other benefits which could be reflected in the campaign success and capital raised.

Campaigns' features are only significant in models 1 and 3, that is in explaining capital raised and success probability. In Model 3, reward for subscription and fork width improve the probability success, while maximum target reduces it. Minimum investment is the only campaigns' feature that is significant and positively linked to capital raised (Model 1). The estimate of the coefficient on Maximum target in Model 3 suggest that small campaigns are more likely to be successful. The presence of business angels, the type of campaign, the equity retention and the amount of share premium are not significant in any model. On the other hand, the presence of business angels is strongly significant and positively linked to capital raised and to the success of campaigns in all models that consider campaigns' features only (models 1.C, 2.C and 3.C); this suggests that the presence of business angels may be related to the features of platforms' networks.

Our considerations so far hint that platform's, issuer's and campaign features are somewhat correlated; indeed, if this was not the case, one would not expect to see important differences in the significance of coefficients when comparing different model versions. Therefore, we set out to compare the explanatory power of different versions within models; this should help us separating the wheat from the chaff, since any version which consistently emerges as superior in such comparisons would suggest that the corresponding set of variables (*i.e.* platform, issuer or campaign related features) is most significant.

In Table 4 we show a comparison of models' version (across columns) for each model (across panels) based on the metrics that we explained at the end of the previous section⁷. When one looks at Model 1, platforms' features have the largest explanatory power by far, as adjusted R-squared and regression standard errors are the lowest for versions A and D. The same conclusion applies to Model 3 with respect to AIC. Model 2 is an exception to this pattern: while version D stands as the best one, version A fares quite poorly compared to B and C. While this issue is worth further investigation, we are confident in reinforcing our claim that platform's features stand out as of paramount importance to campaign success.

Table 4				
Comparison of different versions of regression models				
Model statistics	Model versions			
	A. Platform features only	B. Issuer features only	C. Campaigning features only	D. All features
<i>1. Linear regression of Capital Raised</i>				
Wald statistic	5.4	8.14	3.98	4.7
Degrees of freedom	227	228	224	215
Overall significance (P-value)	> 0.000	> 0.000	> 0.000	> 0.000
Residual standard error	2.3	2.5	2.5	2.2
Adjusted R ²	0.196	0.065	0.0679	0.258
<i>2. Linear regression of Relative Campaign Success</i>				
Wald statistic	3.21	15	4.53	3.36
Degrees of freedom	205	206	205	195
Overall significance (P-value)	0.008	> 0.000	0.001	> 0.000
Residual standard error	1.8	1.7	1.8	1.6
Adjusted R ²	0.047	0.189	0.058	0.256
<i>3. Logistic regression of Campaign Success</i>				
Degrees of freedom	227	228	224	215
Wald test	4.53	2.59	2.85	2.11
Overall significance (P-value)	0.001	0.038	0.005	0.008
Deviance	241.9	256.7	241.4	210.7
Akaike Information Criterion	253.9	266.7	259.4	246.7

Notes: OLS estimation results. The response variable is the logarithm of Raised Capital. Effects of explanatory variables with marginal probability values of 10 percent or less are typed as boldface. Standard errors are heteroscedasticity-robust (Long and Ervin, 2000). The sample size is 233 cases, since nine cases were excluded because of missing values on some explanatory variables and two more outlying influential cases were dropped from the 244 cases original data set.

⁷ See subsection 3.4.

5. Discussion

CFPs act as an intermediary between investors and companies, facilitating the transfer of funds and information between the two. In our analysis of success determinants, platforms' network features emerge as critical for capital raising and for the success of campaigns – be it absolute or relative. The diversity of partners' network, rather than its size, has a significant positive effect on the probability of success, on relative success and on the amount of raised equity funds.

Following theoretical contribution of Belleflamme et al., (2015), our findings pinpoint that the variety of platforms' networks may improve its selection ability and its capability to attract investors, thus campaign success. We also notice that, if this is the case, a bandwagon effect may kick-in, which entices a larger crowd of (possibly uninformed) investors to participate. Heterogeneity of platform's network may strength the “network orchestrators” function of platforms as defined by Löher (2017), conveying new competencies and new business ties to the entire crowdfunding process.

The presence of incumbent industrial shareholders conveys credibility and gives prospective investors confidence in the campaign success and, possibly, in the future outcome of the investment project they are financing. This, along with third-party endorsement – through platform's network – may reduce the hurdle of information gap about projects, thus attracting funding from established business angels or venture capitalists (Mamonov and Malaga, 2018). In accordance with Ahlers et al., (2015), Vismara (2016a), and Mamonov and Malaga (2018) the size (number) of the board member and of previous shareholders are significant when we consider only the companies' features. They have a positive relation with the probability of success and the capital raised, respectively. When we enlarge the perspective to the other subjects - platform and campaign – these variables lose relevance. We notice the same effect when we study the role of business angels. If we consider only campaigns' features, BA involvement in the campaign increases the level of capital raised and the probability of success, absolute and relative. This variable results not statistically significant in the overall models. When we enlarge the perspective to the other subjects – platform and issuer- BA may be involved in the platform network dimension facilitating investors participation.

Overall, the design of campaigns has a marginal effect on success beyond platform and issuers features; anyhow, the entry level for investor, the campaign target and the presence of rewards for participation play a role on some success dimensions. A large minimum investment directly influences the total amount collected in the campaign, but not the probability of campaign success. Large investment thresholds may attract sophisticated investors rather than the crowd: on the other hand, the presence of the formers may entice less informed retail investors to join in. Retail investors may be discouraged by high requirements for funds (Lukkarinen et al., 2016). While Ahlers et al. (2015) and Vismara (2016b) claim that relatively smaller projects are more likely to be financed, our analyses suggest that a trade-off between the size and entry level of campaigns against success may be an issue worth further investigating. The campaigns' features look more relevant in explaining the probability of success rather than the level of capital raised or the relative success, in whose models almost no variable is statistically significant.

6. Conclusions

Equity crowdfunding market is in its growing phase characterized by the entry of new platforms and financial service providers, this increases competition and diversification of products and investments. In particular, CFPs' activities have attracted the attention of researchers and policymakers for their role as intermediaries between investors and firms seeking capital.

Our study highlights the importance of CFPs' network in the performance of campaign success. In particular, our analyses yield two acumen: the pivotal role of platforms in the crowdfunding process and, the positive impact of platforms' network variety on the probability of campaign success and on level of funds raised. The heterogeneity of the partners that belong to platforms' networks improve the screening phase of projects, the selection procedure and the ability to attract professional investors or other informal investors directly in the investment activities through the signalling of the quality of the campaign and the referred information. Platforms' networks variety may blend social relationship and competencies that could entail a complex array of further network relationships.

CFPs are intermediaries that match investors and issuing companies; so, our findings have implications for the decision-making of equity crowdfunding platform managers as well as for entrepreneurs seeking equity through crowdfunding. Platforms managers could derive several benefits from building a varied network of partners, since this may help at different stages of a campaign, as it improves their intermediary functions. Many CFPs, are still working on building a sustainable business model and in defining their competitive positioning. CFPs network variety could contribute in creating an additional revenue streams, offering a strategic value proposition to occupy a market niche in financial sector.

For entrepreneurs wishing to run an equity crowdfunding campaign, the choice of the platform where they launch their project may be crucial for the campaign's success, possibly beyond the features of the campaign itself. CFPs exhibit positive cross-group external effects between funders and fundraisers so in the case of fundraisers looking at the composition of platform network directly influence the chances of campaign success and to reach the amount required.

This result could be extended to the investors' side because it enlarges the cognitive framework behind their assessment and decisions.

From a theoretical perspective, this study sheds light on factors which influence campaign success that, to the best of our knowledge, have not been previously considered. Considering platforms' networks features as a driver of crowdfunding success enlarge and reinforce the assessment role of this actor in the theory-building crowdfunding field.

From a societal point of view, the role of the equity CFPs is relevant to improve the financing of start-up and in supporting entrepreneurship. In a financial system, where is quite difficult to find equity financial sources and to signal the real quality of its project, this type of intermediaries should be considered as a marketplace or a mechanism is able to integrate different skills and professional competencies and to overcome some equity market failures in financing the new entrepreneurship. In the crowdfunding market, CFPS are important players in creating the crowdfunding ecosystem and keeping its healthy. Platform's network influences the interaction within a well-connected community of entrepreneurs and investors

facilitating the access to all kind of relevant resources (knowledge, services, capital), with an enabling role of legislation at the background.

We acknowledge that our study has some limitations. First of all, our study does not evaluate directly platforms' selection procedures or due-diligence activities, so we are not aware of the specific level of involvement of platforms and of their partners in these stages; also, we are not able to directly address the criteria that drive their project selection process. A future study could compare different platforms' selection procedures and explore their relationship with network diversity and campaign success. Furthermore, we did not evaluate network diversity with respect to the dimension of disparity of members' types (Stirling, 1998) since this would have entailed some subjective judgment that we are not yet ready to confidently put forward. Nonetheless, we believe that understanding the differences between platform's partners types would allow to better analyse the determinants of campaign success.

Appendix 1: Model versions

Table A1
Linear regressions of capital raised on platform, issuer and campaign features

Variables (Measure)	A. Platform features only			B. Issuer features only			C. Campaign features only			D. All features		
	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value
<i>Platform features</i>												
Size (Log of count)	1.743	0.773	0.025							0.900	0.754	0.183
Variety (Index, 0 to 100)	0.135	0.124	0.279							0.313	0.150	0.009
Variety ²	-0.002	0.001	0.014							-0.003	0.001	> 0.000
Balance (Index, 0 to 100)	0.096	0.039	0.041							0.079	0.034	0.013
Track record (Log of count)	0.295	0.232	0.204							-0.012	0.251	0.952
<i>Issuer features</i>												
Geographical distance (Km)				0.031	0.066	0.638				0.071	0.082	0.273
Shareholders (Count)				0.012	0.004	0.006				0.008	0.005	0.272
Board members (Count)				0.189	0.098	0.055				0.093	0.093	0.401
Industrial shareholders (Binary)				1.192	0.257	> 0.000				0.913	0.285	0.011
<i>Campaign features</i>												
Business angels (Binary)							0.931	0.351	0.009	0.228	0.350	0.480
Prize for subscription (Binary)							0.747	0.478	0.120	0.669	0.488	0.151
Equity retention (Log of percent)							0.262	0.168	0.121	0.139	0.189	0.486
Fork width (Percent)							-0.001	0.012	0.950	0.004	0.010	0.687
Maximum target (Log of euro)							0.385	0.267	0.151	0.083	0.332	0.750
Minimum investment (Log of euro)							0.172	0.154	0.263	0.389	0.192	0.082
Share premium (Log of euro)							0.003	0.129	0.979	-0.070	0.150	0.620
Take-it-all (Binary)							1.263	1.107	0.255	0.613	1.070	0.442

Notes: OLS estimation results. The response variable is the logarithm of Raised Capital. Effects of explanatory variables with marginal probability values of 10 percent or less are typed as boldface. Standard errors are heteroscedasticity-robust (Long and Ervin, 2000). The sample size is 233 campaigns launched from year 2014 to year 2018.

Table A2
Linear regressions of relative success on platform, issuer and campaign features

Variables (Measure)	A. Platform features only			B. Issuer features only			C. Campaign features only			D. All features		
	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value	Estimate	Standard Error	P-value
<i>Platform features</i>												
Size (Log of count)	-0.779	1.103	0.481							-0.463	4.080	0.556
Variety (Index, 0 to 100)	0.242	0.111	0.030							0.232	0.782	0.033
Variety ²	-0.002	0.001	0.018							-0.002	0.108	0.016
Balance (Index, 0 to 100)	-0.031	0.065	0.633							-0.015	0.001	0.735
Track record (Log of count)	-0.157	0.201	0.433							-0.023	0.216	0.279
<i>Issuer features</i>												
Geographical distance (Km)				0.051	0.048	0.288				0.065	0.054	0.228
Shareholders (Count)				0.018	0.003	> 0.000				0.018	0.007	0.008
Board members (Count)				0.056	0.0813	0.492				0.058	0.079	0.462
Industrial shareholders (Binary)				0.748	0.235	0.002				0.863	0.306	0.005
<i>Campaign features</i>												
Business angels (Binary)							0.869	0.267	0.001	0.263	0.239	0.273
Prize for subscription (Binary)							0.693	0.339	0.049	0.137	0.419	0.744
Equity retention (Log of percent)							0.206	0.110	0.063	0.030	0.096	0.751
Minimum investment (Log of euro)							-0.026	0.213	0.904	0.030	0.232	0.899
Share premium (Log of euro)							0.046	0.028	0.096	0.013	0.027	0.619

Notes: OLS estimation results. The response variable is the logarithm of the ratio of raised capital to the minimum target. Effects of explanatory variables with marginal probability values of 10 percent or less are typed as boldface. Standard errors are heteroscedasticity-robust (Long and Ervin, 2000). The sample size is 211 all-or-nothing campaigns launched from year 2014 to year 2018.

Table A3
Logistic regressions of success on platform, issuer and campaign features

Variables (Measure)	A. Platform features only				B. Issuer features only				C. Campaign features only				D. All features			
	Coefficient	APE	Standard Error	P-value	Coefficient	APE	Standard Error	P-value	Coefficient	APE	Standard Error	P-value	Coefficient	APE	Standard Error	P-value
<i>Platform features</i>																
Size (Log of count)	0.096	0.002	0.010	0.878									0.312	0.004	0.011	0.707
Variety (Index, 0 to 100)	0.257	0.045	0.183	0.015									0.312	0.047	0.019	0.016
Variety ²	-0.002	0.000	0.000	0.002									-0.003	-0.000	0.000	0.003
Balance (Index, 0 to 100)	-0.021	-0.004	0.006	0.537									-0.001	-0.000	0.007	0.986
Track record (Log of count)	0.084	0.002	0.005	0.660									-0.132	-0.003	0.005	0.568
<i>Issuer features</i>																
Geographical distance (Log of Km)					0.024	0.001	0.003	0.704					0.078	0.003	0.003	0.318
Shareholders (Count)					0.034	0.021	0.022	0.336					0.030	0.009	0.021	0.667
Board members (Count)					0.113	0.006	0.004	0.097					0.060	0.005	0.003	0.163
Industrial shareholders (Binary)					0.772	0.135	0.060	0.026					0.706	0.102	0.061	0.093
<i>Campaign features</i>																
Business angels (Binary)									0.133	0.057	0.019	0.026	0.271	0.040	0.056	0.470
Prize for subscription (Binary)									0.229	0.058	> 0.000	> 0.000	1.520	0.181	0.072	0.011
Equity retention (Log of percent)									0.293	0.010	0.007	0.158	0.164	0.005	0.006	0.456
Fork width (Percent)									0.005	0.002	0.003	0.002	0.027	0.004	0.002	0.018
Maximum target (Log of euro)									-0.000	0.000	0.087	0.093	-0.686	-0.001	0.000	0.022
Minimum investment (Log of thousand euro)									0.000	0.000	0.435	0.523	0.340	0.000	0.000	0.310
Share premium (Log of euro)									0.008	0.025	0.748	0.315	-0.060	-0.009	0.023	0.695
Take-it-all (Binary)									-0.113	0.094	0.226	0.191	-0.966	-0.124	0.092	0.175

Notes: ML estimation results. The binary response variable equals one if raised capital achieved the minimum target for campaign success, and zero if it did not. Effects of explanatory variables with marginal probability values of 10 percent or less are typed as boldface. Both model coefficients and average partial effects (APE) are shown; standard errors and marginal probabilities refer to the latter. The sample size is 233 campaigns launched from year 2014 to year 2018.

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