Decoding success in Equity crowdfunding: The impact of lead founders' signals on campaign outcomes

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Abstract

Purpose:

Drawing on signaling theory, this paper emphasizes the role of lead founders' human capital signals in the success of equity crowdfunding (ECF) campaigns, measured by the number of investors and the amount of capital raised.

Design/methodology/approach:

We conduct a set of regression analyses using Ordinary Least Squares (OLS) and Quantile Regressions for a sample of 1,072 initial and seasoned campaigns launched on four ECF platforms: Republic and Crowdcube from the UK, Mamacrowd from Italy, and Invesdor from Finland, spanning the period from 2014 to 2024.

Originality/value:

We contribute to the literature by analyzing a dataset that encompasses both initial and seasoned campaigns launched on four ECF platforms. Furthermore, our study delves deeper, focusing primarily on the lead founder.

Findings:

We find that a lead founder's education and experience in the fields in which the firm operates positively affect the number of investors, and the amount of capital raised, suggesting that such a founder is more convincing and credible to potential investors. However, we find no significant evidence that a lead founder's entrepreneurial experience contributes to the success of an ECF campaign. Additionally, our data indicate that women-led firms tend to attract fewer investors and smaller amounts of funding, suggesting that female founders often garner less interest from investors.

Practical implications:

Our findings provide valuable implications. Lead founders should include information about their educational backgrounds and work experience in their ECF campaigns. Platforms could enhance their due diligence processes by inducing founders to post these elements on the campaign pages and in an organized format particularly for initial campaigns, as these attributes can help potential investors to recognize the ventures' unobserved quality. For seasoned campaigns, platforms may

encourage entrepreneurs to provide previous funding outcomes or performance data rather than human capital characteristics. Additionally, our findings could prompt calls for policymakers to mandate the disclosure of lead founders' backgrounds to protect investors against information asymmetry. Policymakers may also promote initiatives that incentivize and prioritize financing for firms owned by women.
Keywords: Equity crowdfunding, Signaling theory, lead founders' signals.
Paper type: Research paper

1- Introduction

The changes in the financial environment subsequent the financial crisis in 2008 have extremely caused difficulties in accessing new credit from banks (Kahle and Stulz, 2013; Barbi and Mattioli, 2019) and investments through venture capitalists (EVCA, 2013). As a result, an alternative source of financing was necessary for entrepreneurs who have historically been undervalued by traditional financing markets, allowing them to overcome this obstacle and giving a better opportunity to attract financing for their small and unlisted ventures (Molick and Robb, 2016; Barbi and Mattioli, 2019; Coakley *et al*., 2022). This has contributed to the emergence of crowdfunding, an innovative form of entrepreneurial funding and a viable financing option for supporting young ventures. It enables the raising of small amounts of capital from numerous individuals via virtual platforms (Lambert and Schwienbacher, 2010; Ordanini *et al*., 2011; Mollick, 2014; Agrawal *et al*., 2015; Barbi and Mattioli, 2019). ECF, also known as crowdinvesting, is a subdivision of crowdfunding in which small and risky businesses are enabled to sell small financial securities in order to raise the capital they need (Hornuf and Shwienbacher, 2018; Cumming *et al*., 2019; Allen *et al*., 2021; Rossi *et al*., 2021; Coakley *et al.,* 2022). ECF platforms are open to the crowd (Signori and Vismara, 2018; Block *et al*., 2021), meaning that they are accessible even to unexperienced investors lacking the capacity to make investment decisions. As a result, their investments carry significant risk (Barbi and Mattioli, 2019). ECF has captured the attention of policymakers. Initial regulations were introduced in the UK in 2010. This form of crowdfunding was later legalized in other countries, such as the US, Finland, Italy, and Australia. (Barbi and Bigelli, 2017; Barbi and Mattioli, 2019). In terms of size, progress, and regulatory environment, the UK is now the leader in the ECF market (Barbi and Mattioli, 2019). The number of operating ECF platforms in the UK

reached 16 in 2022 (Vu and Christian, 2024), compared to 13 in 2017 and 4 in 2010 (Estrin *et al*., 2018). The growth of the global CF market is expected to reach $38.71 billion in 2029 with a forecast compound annual growth rate (CAGR) of 17.3% (Research and Markets, 2025).

Previous academic research on ECF has relied on Signaling theory (Spence, 1973, 2002) to explain this form of crowdfunding phenomenon (e.g., Ahlers *et al.,* 2015; Piva and Rossi Lamastra, 2018; Coakley *et al*., 2022). The interactions between potential investors, who are non-professionals, and entrepreneurs seeking funding take place exclusively on the internet (Drover *et al*., 2017). Such investors may not have great experience in evaluating investment opportunities (Block *et al.,* 2018; Barbi and Mattioli, 2019; Agrawal *et al.,* 2014) or in performing deep due diligence face-to-face with entrepreneurs searching for financing for their start-ups (Piva and Rossi Lamastra, 2018). Additionally, they need to make their investment choices within a limited duration (Courtney *et al.,* 2017). As a result, even start-ups with high potential for success may not raise funding (Ahlers et al. 2015). Accordingly, entrepreneurs are interested in demonstrating attributes and taking actions that act as signals of their start-ups' intrinsic quality, thereby helping to overcome the information asymmetries experienced by uninformed investors (Barbi and Mattioli, 2019). Before making their investment decisions, these investors must search for these signals within the information provided by the entrepreneurs in the crowdfunding campaign documents or readily available on the internet (Piva and Rossi Lamastra, 2018). According to the literature on entrepreneurial finance, we emphasize that among these signals, founders' human capital is the key one that holds a prominent position. Ventures possessing superior human capital quality are likely to operate more efficiently, attract more funders, and raise significant amounts of capital (Zacharakis and Meyer, 2000). Human capital encompasses various aspects and is closely associated with the skills and abilities of entrepreneurs, resulting in the success of start-ups and the remuneration of their investors for the uncertainty linked to their future potential (Ahlers *et al.,* 2015). Building on the idea that founders' human capital characteristics serve as significant indicators for professional investors, such as venture capital firms (Robb and Robinson, 2014), various studies indicate that they are impactful signals for ECF investors (Ahlers *et al.,* 2015; Piva and Rossi-Lamastra, 2018; Barbi and Mattioli, 2019; Coakley *et al.,* 2022). This is especially true given the risk and opacity of early-stage firms in the market, as well as the often-unsophisticated nature of crowdfunding investors (Barbi and Mattioli, 2019). Educational background, professional experience, and gender differences are some of the most relevant factors. Drawing on

signaling theory, this study explores whether lead founders' human capital signals facilitate the success of ECF offerings. Success is measured by the total number of investors backing the campaign and the total amount of capital raised. We follow Piva and Rossi Lamastra (2018), Lim and Busenitz (2020), Troise *et al.* (2022) and Coakley *et al.* (2022) in positioning the founder as central to our analyses. As potential investors may only require the lead founder to possess superior human capital characteristics, our contribution is to delve deeper by primarily focusing on the lead founder. We argue that the lead founder's human capital can serve as a powerful signal to unsophisticated investors. Additionally, the existing literature primarily focuses on initial campaigns within specific contexts. We also contribute to this body of research by analyzing a dataset that encompasses both initial and seasoned campaigns launched on four ECF platforms: Republic and Crowdcube from the UK, Mamacrowd from Italy, and Invesdor from Finland, this dataset spans the period from 2014 to 2024. Our paper provides significant novelty by investigating whether human capital attributes operate differently for Initial campaigns compared to Seasoned ECF campaigns. Furthermore, our paper offers notable originality and valuable insights by examining whether a venture that provides information about founder's backgrounds, easily accessible on the campaign page, performs better to attract more funds and more investors compared to a venture that does not disclose such information.

The reminder of this paper is structured as follows: section two summarizes the entrepreneurial finance literature concerning the educational background, the professional experience, and the gender diversity as human capital signals and presents the testable hypotheses. The data and methodology are presented in the third Section. Section four discusses our econometric results. Section five presents the results of the robustness checks. Finally, Section six summarizes the findings and discusses the contributions, implications, limitations and extensions for future research.

2. Related literature and hypothesis development

2.1. Educational background

Educational background can be viewed as a signal for unobservable entrepreneurial management ability. Hsu (2007) finds that having team members with a PhD has a positive impact on financing from venture capital investors in early-stage online businesses. Similarly, Gimmon and Levie (2010) show that founders with high educational degrees, such as a doctorate or a "professor" title,

have a higher chance of securing funding for their new companies. In the context of crowdfunding, Ahlers *et al.* (2015) indicate that founders holding an MBA degree are more likely to increase the number of ECF backers. Examining a dataset of 284 entrepreneurs who initiated ECF campaigns in Italy from mid-2012 to December 2013, Piva and Rossi Lamastra (2018) extend the conclusions of Ahlers *et al.* (2015) by analyzing the impact of various human capital signals on funding success. They expect that a founder's education in business (i.e., economics and management) and in industry-related fields (i.e., the areas in which their start-ups operate) serves as effective signals to attract more investors compared to other fields of education. On one hand, founders with education related to their start-up fields have more competencies that enable them to effectively run their ventures: they may possess the skills to resolve specific technical difficulties related to those fields, comprehend the demands of industry-specific clients, and apply industry-specific technologies (Lofstrom *et al.,* 2014). On the other hand, given that choosing and completing educational programs is related to individuals' innate abilities (e.g. Wang and Degol, 2013), founders with business education are more likely to possess natural aptitudes that allow them to create more effective business and marketing strategies, understand how markets operate, grasp the demands of their customers, and comprehend their competitive landscapes (Piva and Rossi Lamastra, 2018). The findings of Piva and Rossi Lamastra reveal that business education significantly contributes to the success of ECF campaigns, while industry-related education does not. However, using data from the US spanning from 2015 to 2016, Lim and Busenitz, (2020) indicate that having a bachelor's degree in business does not significantly influence a founder's ability to raise capital. Additionally, utilizing a dataset of 521 funded firms from 2011 to 2017 on the UK ECF platform Crowdcube, Barbi and Mattioli (2019) demonstrate that ventures with at least one graduate team member are more likely to raise higher amounts of capital and attract a greater number of investors than those with non-graduate team members. Johan and Zhang (2020) examine the average educational stages of venture directors, ranging from "high school" to "completed doctorate". The findings reveal that the more educated the managers of a venture are, the more capital is raised. More recently, analyzing data from 1,291 initial campaigns in the UK from 2013 to 2018, Cockley *et al.* (2022) also provide evidence that a founder's higher educational attainment (holding titles of "doctor" or professor") positively impacts the probability of success in an ECF campaign. Furthermore, Prokop and Wang (2022) state that the PhD degrees held by

managing directors seem to have a slightly positive effect on crowd investors' contributions to the campaign.

H1: A lead founder's education in the field is more likely to increase the success of an ECF campaign.

2.2. Professional experience

Prior studies support the importance of experienced founders as a valuable human capital signal in entrepreneurial finance. They have a better innate capacity to investigate and exploit the finest opportunities (for more details, see, for example, Spivack *et al.*, 2014). Also, through their previous experiences, they have acquired several skills and talents that are essential in the entrepreneurial field (Lazear, 2004, 2005). Hsu (2007) demonstrates that founders with prior work experience can adeptly solve difficulties and navigate challenging circumstances through their strong negotiation skills. The study also shows that failed entrepreneurial experiences are valued by external investors. Indeed, the talents and social ties with suppliers and clients acquired from both previous successful and unsuccessful enterprises are vital resources for current ones (Piva and Rossi Lamastra, 2018). Additionally, since industry-specific expertise and industry-specific social capital are both beneficial resources for an entrepreneur (Shepherd, 1999), previous professional experience in the corresponding sector significantly determines the growth of a new project (Colombo and Grilli, 2005). Within the ECF crowdfunding literature, Piva and Rossi Lamastra (2018) find that founders with prior work experience, gained by leading one or more ventures (i.e., entrepreneurial profession), are more likely to succeed than those with any other profession. This result confirms the argument that crowdfunding funders can readily perceive that the high quality of a new venture seeking equity funding is appreciated by the founder's previous entrepreneurial experience, which provides the competencies and skills that enable the detection and exploitation of profitable opportunities (Piva and Rossi Lamastra, 2018). However, Piva and Rossi Lamastra (2018) find no evidence that founders with professional experience in the fields in which their start-ups operate are more likely to succeed than those with experience in other fields. This result contrasts with the argument that investors are likely to deduce that a founder who has prior working experience in the same industry as the start-up, is well-acquainted with its environment (a related argument is presented by Cohen and Dean, 2005). Such a founder possesses extensive industry-specific expertise in technologies, production methods, competitive dynamics (for example,

Gimeno *et al.*, 1997; Burton *et al.*, 2002; Behrens *et al.*, 2012), which can enhance the capability to identify opportunities within the industry (Feeser and Willard, 1990). Furthermore, by being previously employed in the start-up industry, the founder has probably established social connections with suppliers, consumers, and other key stakeholders, which can potentially be leveraged to benefit the start-up (Piva and Rossi Lamastra, 2018). Additionally, Barbi and Mattioli (2019) demonstrate that the work experience in finance and the business field of the team members positively influences the total amount raised in an ECF campaign, while prior professional experience in the same field as the start-up has no significant effect on campaign outcomes. Lim and Busenitz, (2020) find that having at least one founder with prior senior management experience in small organizations positively affects the amount raised in an ECF campaign. However, they find no evidence supporting this effect for senior management experience in large organizations. They also demonstrate that having previously founded a firm contributes to an increase in the capital raised, while the founder's involvement in multiple firms at the time of the campaign has a negative effect on the amount of capital raised. Johan and Zhang (2020) find a positive effect of the average number of years spent by start-up directors in the relevant industry on the ECF campaign outcomes. More recently, Coakley *et al.* (2022) use the founding team's tenure range as an indication of firm-specific expertise and the founding team's age range as an indication of general experience. They find that the tenure and age heterogeneity of the founding team positively influence the probability of successful ECF campaigns. Analyzing 110 campaigns conducted across seven Italian ECF platforms from 2014 to 2018, Troise *et al.* (2022) find no evidence that founder's prior industry-related experience influences the number of crowd investors, or the total of funds collected, while founder's prior start-up experience positively affects funding success.

H2a: A lead founder's experience in the field is more likely to increase the success of an ECF campaign.

H2b: A lead founder's entrepreneurial experience is more likely to increase the success of an ECF campaign.

2.3. Gender gap

There is a strong consensus in the financial literature that female founders encounter significant obstacles when seeking external financing from traditional financial markets (Orser *et al.*, 2006;

Coleman and Robb, 2009; Alesina *et al.*, 2013; Aristei and Gallo, 2016). Female founders are frequently viewed as less skilled in business development and innovation and tend to receive fewer firm resources compared to their male counterparts (Thébaud, 2010; Mitchelmore and Rowley, 2013). Similarly, prior studies indicate that there are gender-related disparities in business angel and venture capital funding (Becker-Blease and Sohl, 2007; Kanze *et al.*, 2018; Guzman and Kacperczyk, 2019). One reason for this gap is attributed to differences between men and women in networks, human capital, growth goals, or the nature of firms run by men and women (Carter and Rosa, 1998). Women are less likely to possess previous managerial or entrepreneurial backgrounds and to engage in networks with affluent individuals (Verheul and Thurik, 2001). The current findings on gender differences in crowdfunding present an unclear picture due to the diversity in nature between equity crowdfunding and other forms of crowd investments (Prokop and Wang, 2022). For example, a laboratory experiment data analyzed by Greenberg and Mollick (2017) reveals a positive correlation between projects proposed by women and the success of reward crowdfunding campaigns. This effect is particularly pronounced for women presenting technological projects. Thus, becoming consumer in reward crowdfunding is more related to social and ethical considerations compared to entrepreneurial financial markets (Vismara, 2018). However, individuals investing in ECF are more likely to demonstrate behaviors and preferences similar to those of investors in traditional forms of financing, and they pledge more funds to ventures initiated by men (Vismara *et al.*, 2017; Geiger and Oranburg, 2018; Cumming *et al.*, 2020). The gender gap in ECF studies is rather mixed. Vismara *et al.* (2017) analyze 58 offerings on the UK ECF platform Republic between October 2015 and March 2016, they find that campaigns led by female CEOs are more likely to be successful. However, they observe that the proportion of women in senior management team has a negative effect on campaign success. Using 243 campaigns listed in the US ECF market until mid-March 2018, the research of Geiger and Oranburg (2018) reveals that female founders raise a smaller amount of funding compared to male founders. Consequently, they posit that, in terms of gender dimension, ECF may not lead to a democratizing impact. In addition, analyzing 3.576 initial ECF offerings in the US and UK, Rossi *et al.* (2021) show that female founders tend to set lower funding targets, while still raising a relatively smaller amounts compared to their male peers. Based on 99 initial public offerings on London's AIM (Alternative Investment Market) and 167 offerings on the UK ECF platform Crowdcube, Cumming *et al.* (2021) find that having women as part of the senior management team

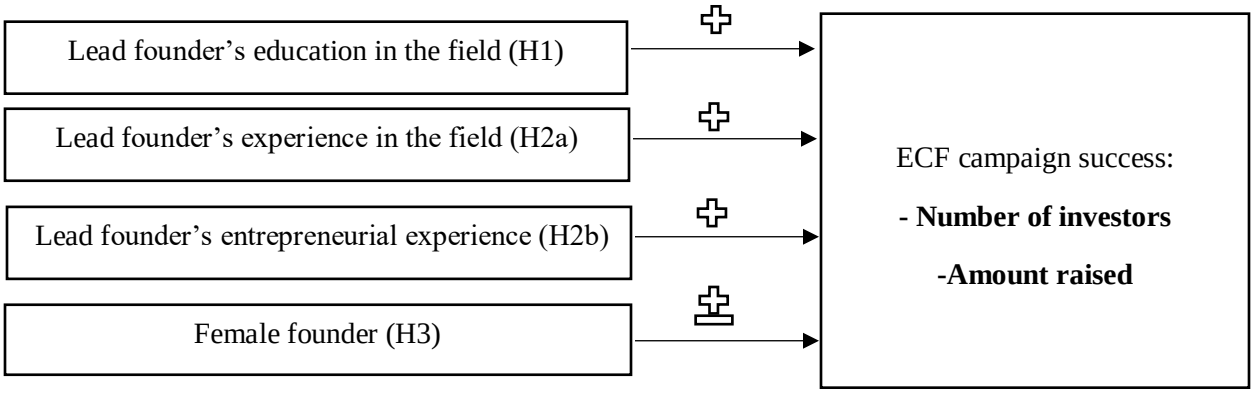
or in leadership roles has no significant effect on campaign success. Using Italian ECF platforms, Battaglia et al. (2022) find that the presence of female founder is significantly and positively affects the amount capital raised. Using 255 campaigns from German ECF platforms, Prokop and Wang (2022) extend the research of Cumming *et al.* (2021) and Rossi *et al.* (2021). They show that, in initial offerings, ventures led by female managing directors has no significant effect on raising capital. In contrast, in seasoned offerings, these ventures are less likely to raise capital compared to those led by men. Prokop and Wang (2022) also demonstrate that by setting greater funding thresholds, female founders could enhance their success in initial offerings and reduce the gender disparity in seasoned offerings.

H3a: A firm led by a female founder is less likely to succeed in an ECF campaign.

H3b: A firm led by a female founder is more likely to succeed in an ECF campaign.

Figure 1 summarizes the four hypotheses.

Figure 1: Research design



Source: Developed based on the literature.

Note: This diagram outlines the introduced hypotheses, indicating the expected signs of the relationships.

3. Data and methodology

3.1. Data sources and sample identification

Our initial data collection contains 1,395 initial and seasoned ECF campaigns[1] launched on four platforms. Most campaigns are from Crowdcube and Republic (previously Seedrs), which are

[1] According to Coakley et al. (2021) The term "seasoned ECF campaigns" refers to campaigns conducted following the initial successful campaign.

among the well-established platforms in the UK market (Rossi and Vismara, 2018). Offerings on both platforms are primarily equity offerings (Rossi *et al.*, 2021). To extend our data to more platforms from Europe, we included offerings from Invesdor, a Finnish ECF platform founded in 2011. It is also one of the first and largest ECF platforms in Europe. Additionally, we included campaigns from Mamacrowd, an Italian ECF platform. The reason we specifically chose to add these two ECF platforms is that their characteristics align with those of Crowdcube and Republic, allowing us to consolidate the data seamlessly. All these platforms operate according to the "All-Or-Nothing" model[2].

Our data is hand-collected, merged and aggregated from multiple sources. We initially identified and extracted detailed information concerning the characteristics of each campaign from the publicly available data on platforms, including the number of investors participating in the campaign, the number of social media links on the campaign page, and information about technology firms. We also identified the campaign date to determine whether it was before or after the COVID-19 pandemic[3]. For human capital variables, we first looked for the number of core team members listed on the campaign page, along with their brief biographies when available. We also searched for their first names and profile photos to check the presence of women. This dataset is then augmented using the lead founders' LinkedIn profiles, manually searching for information regarding their educational and professional backgrounds (when this information is not declared in the brief biographies) and the founders' gender (when the photos are unavailable on the campaign pages). Specifically, we consider an individual to be a lead founder, if he/she defined as a founder, owner, or entrepreneur, and serves as the CEO, or holds the majority of shares (i.e. majority shareholder) in the company. In some businesses, leadership and ownership are shared equally (or nearly equally) among the founders (i.e. none of the founders holds a majority stake and there is no designated CEO, or all founders may share the CEO role or simply be listed as Co-founders or hold other titles without a formal CEO title). In such a structure, each founder is considered a lead founder.

[2] i.e. if the business fails to meet the target capital, the proponent receives no funds, and the crowd investors are not charged.

[3] According to the World Health Organization, we coded an offering as a post-covid if it closed on or after 11 March 2020.

To obtain the largest dataset possible, missing data is then extracted from the businesses' websites as well as from Companies House[4]. All these sources have been used in other ECF studies related to ours, such as Piva and Rossi Lamastra (2018), Barbi and Mattioli (2019), Coakley *et al.*, (2022), and Prokop and Wang (2022). Due to the difficulty in collecting data concerning founders, we excluded 323 campaigns with missing information[5]. For example, it is incorrect to classify a founder as a non-graduate if no information is available from either source. This underestimates founders with educational backgrounds. Our empirical analyses are based on 1,072 ECF campaigns, consisting of 656 initial campaigns and 416 seasoned campaigns, conducted by 654 businesses and launched and closed between 2014 and 2024. Table I provides a description of our data.

Table I: Data description

	Republic	Crowdcube	Mamacrowd	Invesdor	Total
Number of businesses	413	186	29	26	654
Number of campaigns	716	293	29	34	1072
Number of initial campaigns	408	197	29	22	656
Number of seasoned campaigns	308	96	0	12	416
Number of campaigns by non-UK businesses	75	35	29	26	165

Source: Own computation. Created by authors.

Public information on the platforms is available exclusively for successful campaigns, and campaigns that did not meet the target capital (i.e., unsuccessful campaigns) are removed. One possible reason is that platforms may display a list of past and present campaigns for marketing purposes, leading to the deletion of unsuccessful campaigns (Vu and Christian, 2024).

During the process of gathering our dataset, we came across notable success stories from various businesses. One such example is "Freetrade Limited", a UK based, award-winning investment platform that offers commission-free trading. The firm's mission is to make trading accessible to everyone. Between 2016 and 2023, the company successfully raised more than £29 million through ten campaigns (equity and convertible) on Crowdcube from 33.780 investors. In 2019 and 2020, Freetrade was recognized as the best online investment platform at the British Bank Awards. The

[4] Companies house is a website worked by a government agency providing additional information about UK firms.
[5] Such as a founder's education or experience backgrounds not declared in the LinkedIn profile, or instances where there is no photo to determine if the founder is a man or woman

company's founder and CEO, Adam Dodds, has an educational background in finance from McGill University, which is ranked among the 100 most developed universities in the world. Adam also brings years of professional experience in the finance sector.

3.2. Method and variables

According to previous studies (Cumming *et al.*, 2021; Prokop and Wang, 2022; Vu and Christian, 2024), our two dependent variables measuring the success of ECF offerings are *Ln_investors*, which captures the natural logarithm of the number of investors participating in an ECF campaign and *ln_raised*, which represents the natural logarithm of the capital raised at the end of the campaign. These variables are estimated using Ordinary Least Squares (OLS) with robust standard errors. Year and Country fixed effects are included. Standard errors are clustered at the industry level. For our set of human capital variables, we follow previous studies such as Piva and Rossi Lamastra (2018), Barbi and Mattioli (2019), Lim and Busenitz (2019), Coakley *et al.* (2022), and Triose *et al.* (2022). To test H1, we use an independent variable that captures the founder's education background: *Education-in-the-field*, a dummy variable that takes the value of one if the founder's education is related to the venture's industry. Additionally, to test H2, we employ two variables that highlight the founder's professional experience: (H2a) *Experience-in-the-field*, which indicates whether the founder's experience is related to the venture's industry, and (H2b) *Entrepreneurial experience*, which assesses whether the founder has previously owned a firm before the current one. Furthermore, to test H3a and H3b and emphasize the gender diversity in human capital, as highlighted by Cumming *et al.* (2021), Rossi *et al.* (2021), and Prokop and Wang (2022), we employ a dummy variable that takes the value of one if the founder is a woman (*Female-founder)*. Our paper also incorporates a set of control variables. The dummy variable *Covid-19* is used to capture campaigns conducted during the COVID-19 pandemic, as used by Vu and Christian (2024). *Core-team* refers to the number of core team members featured on the campaign page, as employed by Ahlers *et al.* (2015) and Coakley *et al.* (2022). *Tech-industry* refers to firms in the technology industry, as noted by Barbi and Mattioli (2019) and Cumming et al. (2021). *Ethnic-minority* controls for racial disparities, following Younkin and Kuppuswamy (2018) and Cumming *et al.* (2021). This variable takes the value of one when at least one member of the core team is non-Caucasian. Following Barbi and Mattioli (2019), we also employ *Links*, which refers to the number of external websites and social media links on the offering page,

including Twitter, Facebook, Instagram, LinkedIn, Companies House and the firm's website. Full variables and their definitions are given in Table II.

Table II: Variable definitions

Variables	Definitions
Dependent variables	
Ln_investors	The natural logarithm of the number of investors involved in the campaign.
Ln-raised	The natural logarithm of the amount raised during the campaign
Independent variables	
Education-in-the-field	Dummy = 1 if the education background of the lead founder is related to the venture's industry, 0 otherwise.
Experience-in-the-field	Dummy = 1 if the past professional experience of the lead founder is related to the venture's industry, 0 otherwise.
Entrepreneurial-experience	Dummy = 1 if the lead founder has previously established another venture before the current one, 0 otherwise.
Female-founder	Dummy = 1 if the founder is a woman, 0 otherwise.
Controls	
Covid-19	Dummy = 1 if the end date of the campaign was in or after 11 March 2020, 0 otherwise.
Core-team	The number of core team members featured on the campaign page.
Tech-industry	Dummy = 1 if the venture is operated in the technology sector, 0 otherwise.
Ethnic-minority	Dummy = 1 if there is a non-Caucasian member in the core team, 0 otherwise.
Links	Number of external links on a campaign page including Twitter, Facebook, Instagram, LinkedIn, Companies House, and website.

Source: Developed based on the literature.

4. Empirical results

In this section, we first report descriptive statistics for a sample of 1,072 initial and seasoned ECF campaigns. We then present and discuss the main results of our multivariate analysis.

4.1. Univariate analysis

Table III: Descriptive statistics for the dependent, independent and control variables employed in the empirical analyses.

Variables	N	Mean	SD	Min	Max
Investors	1,072	501.4021	1334.504	6	35899
Raised	1,072	898.1781	1479.115	0.813	19928.68
Education-in-the-field	1,072	0.405	0.491	0	1
Experience-in-the-field	1,072	0. 573	0.495	0	1
Entrepreneurial-experience	1,072	0.409	0.492	0	1
Female-founder	1,072	0 .253	0.435	0	1
Covid-19	1,072	0.549	0.498	0	1
Core-team	1,072	5.971	3.502	1	22
Ethnic-minority	1,072	0.041	0.201	0	1
Links	1,072	3.861	1.272	0	6
Tech-industry	1,072	0.694	0.461	0	1

Source: Developed based on the literature.

Regarding our dependent variable, the number of investors ranges from a minimum of 6 to a maximum of 35899 per campaign, resulting in an average of over 500 investors per campaign. This is strongly comparable to the study by Vu and Christian (2024). Looking at the human capital features, lead founders with educational backgrounds related to their firms' industries constitute 40.5% of the total lead founders, compared to 22% in the study by Piva and Rossi Lamastra (2018). Additionally, over half of the lead founders (57.3%) have professional backgrounds in the fields related to their firms' industries, while 40.9% previously owned a firm before the current one. We observe that only 25.3% of founders are women, compared to 28.2% in Rossi *et al.* (2021). Interestingly, regarding the variable *Covid-19*, our descriptive statistics report that over half of our sample of initial and seasoned campaigns (57.9%) was initiated on or after the COVID-19 pandemic. In addition, the number of core team members presented on each campaign page spans from 1 to 22 with an average of 3.5 per campaign. For the majority of campaigns, the founder team size ranges from 1 to 3 founders. Our sample contains more than half of the ventures from the technology industry, accounting for 69.4%. Our descriptive statistics are presented in Table III.

Table IV summarizes the results of the multicollinearity test among the variables by showing their correlation matrix. Generally, the table reports low correlations between the employed variables. Additionally, we performed a variance inflation factor (VIF) analysis, which indicates that

multicollinearity is not an issue in our estimates. Specifically, the average VIF is 1.16, significantly below the threshold of 5. The maximum VIF is 1.50, significantly below the threshold of 10.

Table IV: Correlation Matrix for all variables used in the empirical analyses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	VIF
(1) Ln-investors	1.0000											
(2) Ln-raised	0.5822	1.0000										
(2) Education-in-the-field	0.2193	0.1831	1.0000									1.50
(4) Experience-in-the-field	0.1508	0.1410	0.5087	1.0000								1.44
(5)Entrepreneurial-experience	0.0378	0.0076	0.0088	0.1900	1.0000							1.10
(6) Female-founder	-0.1067	-0.1195	-0.1387	-0.1007	-0.0174	1.0000						1.06
(7) Covid	0.2096	0.2307	0.0899	0.1275	0.0831	0.0349	1.0000					1.07
(8) Core-team	0.2375	0.2755	0.0845	0.0683	0.0437	-0.1381	0.0225	1.0000				1.05
(9) Ethnic minority	-0.0195	-0.0395	-0.0210	-0.0167	-0.0135	0.0816	0.0026	-0.0209	1.0000			1.01
(10) Links	0.3264	0.1979	0.0513	0.0687	-0.0298	0.0214	0.2106	0.1028	0.0156	1.0000		1.07
(11) Tech-industry	0.0215	0.1338	0.3043	0.1058	0.0178	-0.2612	-0.0317	0.1264	-0.0326	-0.0503	1.0000	1.19
Mean VIF												1.16

4.2. Multivariate analysis

In this part of the section, we conduct a set of regression analyses to examine the impact of human capital dimensions on the success of ECF campaigns, measured by the number of investors participating in the campaign (*Ln-investors*) and the amount of capital raised during the campaign (*Ln-raised)*.

On one hand, models 1-3 successively incorporate, but separately, the human capital variables along with a common set of controls. The previously mentioned human capital variables pertain to the lead founder's education-specific attribute*: education-in-the-field* (model 1), the lead founder's experience-specific attributes: *experience-in-the-field* and *entrepreneurial experience* (model 2), and the gender gap represented by *female founder* (model 3). Model 4, on the other hand, simultaneously employs all independent variables along with the full set of controls. The results for the OLS regressions of *Ln-investors* and *Ln-raised* are summarized in Table V.

In support of H1, our results in models 1 and 4 in table V suggest a positive impact of *education-in-the-field* on *Ln_investors* at significance levels of 1% and 5%. Models 1 and 4 in table VI continue to show a positive and statistically significant impact of *education-in-the-field*, even with *Ln-raised* as a dependent variable. This demonstrates that possessing an educational background related to the venture's industry significantly increases the likelihood of attracting more investors to support an ECF campaign resulting in a larger amount of funding pledged. H1 is supported. Similarly, the impact of *experience-in-the-field* on *Ln_investors* is positive (model 2 in tables V and VI). Specifically, professional experience in fields related to the venture's industry contributes to attracting a greater number of investors to the campaign and a higher amount of capital raised. Thus, we support H2a. This effect is insignificant when all independent variables are included in the same model (model 4 in tables V and VI). The positive impact aligns with the findings of Johan and Zhang (2020) who used the average years of managers' experience in the corresponding industry as a proxy. However, our findings in Models 2 and 4 show no evidence that *entrepreneurial experience* positively affects *Ln_investors* as well as *ln-raised*. As a result, H2b is rejected. This aligns with the findings of Lim and Busenitz (2020), who find that founders' prior management positions in large organizations do not significantly influence the amount of capital raised. Our findings stand in contrast to those of Piva and Rossi Lamastra (2018) and Troise *et al.* (2022). This discrepancy could be attributed to changes in ECF market dynamics or shifts in

investor sentiment over time. Investors' preferences in ECF may have evolved; thus, they might be more inclined to engage with founders who have education and experience in industries related to their ventures. Geographical focus could also influence outcomes. This may also be attributed to the increase in the number of campaigns in recent years, which allows us to analyze a larger pool of both initial and seasoned campaigns. The estimates in models 3 and 4 provide evidence that *Ln_investors* and *ln-raised* are negatively affected by *female founder* at significance levels of 1% and 5%. This suggests that the presence of female founders may have less impact than that of male founders in attracting investors and in raising finance through an ECF campaign. Our results, therefore, provide support for H3a and reject H3b. The findings of Cumming *et al.* (2021), Rossi *et al.* (2021), and Prokop and wang (2022) concerning gender gap in ECF are strongly related to ours.

Regarding the control variables, our empirical findings suggest that the size of the *Core team* significantly influences the success of an ECF campaign as noted by Barbi and Mattioli (2019) and Johan and Zhang (2020). In addition, all models exhibit a significantly positive slope, implying that as the number of external links increases, the likelihood of attracting a greater number of investors and raising a higher amount of capital also increases. However, across the majority of models, the presence of *Ethnic minority* members among the core team does not appear to influence either the number of investors or the amount raised. *Covid-19 campaigns* initiated during or after the pandemic period are associated with raising fewer funds from a smaller number of investors.

Table V: Analyses of the impact of founders' human capital signals on the success of ECF campaigns measured by *ln-investors,* using OLS regressions.

	Model 1	Model 2	Model 3	Model 4
Education-in-the-field	0.416***			0.379**
	(0.126)			(0.129)
Experience-in-the-field		0.246**		0.0429
		(0.0804)		(0.0615)
Entrepreneurial-experience		-0.0259		0.00535
		(0.0840)		(0.0892)
Female-founder			-0.258***	-0.224**
			(0.0667)	(0.0722)
Covid-19	-0.708***	-0.654***	-0.528**	-0.617***
	(0.0883)	(0.124)	(0.217)	(0.100)
Core-team	0.0627***	0.0642***	0.0625***	0.0593***
	(0.0161)	(0.0179)	(0.0186)	(0.0165)
Ethnic-minority	-0.176	-0.189	-0.157	-0.143
	(0.228)	(0.215)	(0.226)	(0.236)
Links	0.241***	0.244***	0.250***	0.242***
	(0.0360)	(0.0368)	(0.0431)	(0.0388)
Tech-industry	-0.103	-0.00187	-0.0272	-0.149
	(0.0953)	(0.127)	(0.129)	(0.0897)
Constant	4.190***	3.790***	3.880***	4.099***
	(0.256)	(0.357)	(0.190)	(0.283)
Number of Obs	1,072	1,072	1,072	1,072
R-squared	0.274	0.257	0.256	0.281
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table VI: Analyses of the impact of founders' human capital signals on the success of ECF campaigns measured by *ln-raised*, using OLS regressions.

	Model 1	Model 2	Model 3	Model 4
Education-in-the-field	0.284*			0.210***
	(0.154)			(0.0801)
Experience-in-the-field		0.240**		0.124
		(0.0860)		(0.0808)
Entrepreneurial-experience		-0.128		-0.110
		(0.0791)		(0.0747)
Female-founder			-0.197**	-0.170**
			(0.0876)	(0.0755)
Covid-19	-1.086***	-1.051***	-0.955***	-1.012***
	(0.187)	(0.197)	(0.142)	(0.253)
Core-team	0.0737***	0.0749***	0.0733***	0.0716***
	(0.0119)	(0.0137)	(0.0135)	(0.0118)
Ethnic-minority	-0.226	-0.234*	-0.210	-0.201
	(0.138)	(0.117)	(0.129)	(0.140)
Links	0.118***	0.117***	0.124***	0.116***
	(0.0280)	(0.0275)	(0.0332)	(0.0383)
Tech-industry	0.242**	0.304*	0.289*	0.211***
	(0.0917)	(0.136)	(0.140)	(0.0742)
Constant	5.628***	5.423***	5.414***	5.589***
	(0.372)	(0.486)	(0.351)	(0.337)
Number of Obs	1,072	1,072	1,072	1,072
R-squared	0.242	0.240	0.235	0.248
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

5. Robustness checks and additional analyses

To ensure the consistency of our empirical results, we perform a set of analyses. First. To address concerns that extreme values in number of investors can drive results obtained from mean-based models, the system of models is replicated by replacing the OLS regressions with Quantile regressions. This alternative approach enables us to examine the impacts across the distribution of the number of investors and perform a more robust analysis against the effects of overdispersion.

The results in tables VII and X show that *Education-in-the-field* has a positive impact on attracting a greater number of investors at different levels of distribution, i.e. regardless of whether the campaigns are at a lower end (i.e. at the 25^{th} percentile), at the median (i.e. at the 50^{th} percentile), or at higher level of investor participation (i.e.at the 75^{th} percentile). Our results in table VIII also show that, at the 25^{th} percentile, *Experience-in-the-field* plays an important role in attracting investors backing the campaigns. At the 50^{th} percentile, the effect is stronger and remains significantly positive at 75^{th} percentile. This effect is non-significant when all variables are included in the same models (table X). Regarding the impact of *Female-founder* (table IX), our findings show that, at the 25^{th} percentile of investor participation, the effect of having female founders is insignificant. This suggests that, at this percentile, investors are indifferent to whether the founder is woman or man. At the median, the effect becomes significantly negative. Suggesting that campaigns with female founders tend to attract fewer investors than those with male ones.

This negative effect continues to be significant and becomes even more pronounced in campaigns with the higher end of investor participation (i.e.at the 75^{th} percentile). The effect of (tables VIII and X) *Entrepreneurial-experience* remains insignificant across all models. Overall, our findings are related to those discussed in table V.

Table VII: Analyses of the impact of founders' education on the success of ECF campaigns measured by *ln-investors, using* Quantile regressions.

	Model 1 (Q25)	**Model 2** (Q50)	**Model 3** (Q75)
Education-in-the-field	0.317***	0.392***	0.339***
	(0.0902)	(0.0739)	(0.0766)
Covid-19	0.254*	0.236**	0.348***
	(0.142)	(0.0930)	(0.0941)
Core_team	0.0643***	0.0638***	0.0584***
	(0.00959)	(0.00924)	(0.00996)
Ethnic_minority	-0.125	0.0175	-0.212
	(0.259)	(0.153)	(0.209)
Links	0.225***	0.207***	0.229***
	(0.0511)	(0.0350)	(0.0291)
Tech_industry	-0.224***	-0.154*	-0.00498
	(0.0625)	(0.0866)	(0.0806)
Constant	3.622***	4.239***	4.624***
	(0.189)	(0.139)	(0.103)
Number of Observations	1,072	1,072	1,072
Pseudo R-squared	0.1000	0.0961	0.1092

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table VIII: Analyses of the impact of founders' experience on the success of ECF campaigns measured by *ln-investors, using* Quantile regressions.

	Model 1 (Q25)	**Model 2 (Q50)**	**Model 3 (Q75)**
Experience-in-the-field	0.166**	0.300***	0.195***
	(0.0730)	(0.0681)	(0.0670)
Entrepreneurial-experience	-0.0570	-0.0603	0.105
	(0.101)	(0.0693)	(0.0706)
Covid-19	0.300***	0.300***	0.314***
	(0.0752)	(0.0508)	(0.0699)
Core_team	0.0648***	0.0676***	0.0590***
	(0.0103)	(0.00774)	(0.0100)
Ethnic-minority	-0.147	0.0822	-0.189
	(0.236)	(0.126)	(0.155)
Links	0.232***	0.204***	0.210***
	(0.0451)	(0.0242)	(0.0324)
Tech_industry	-0.167*	-0.0343	0.183***
	(0.0905)	(0.0764)	(0.0631)
Constant	3.549***	4.112***	4.546***
	(0.281)	(0.101)	(0.165)
Number of Obs	1,072	1,072	1,072
Pseudo R-squared	0.0926	0.0911	0.1064

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table IX: Analyses of the impact of female founders on the success of ECF campaigns measured by *ln-investors, using* Quantile regressions.

	Model 1 (Q25)	Model 2 (Q50)	Model 3 (Q75)
Female-founder	-0.0831	-0.219***	-0.275***
	(0.0777)	(0.0798)	(0.0642)
Covid-19	0.326***	0.301***	0.416***
	(0.123)	(0.0679)	(0.0618)
Core-team	0.0631***	0.0665***	0.0617***
	(0.0100)	(0.0133)	(0.00932)
Ethnic-minority	-0.104	0.0123	-0.0981
	(0.270)	(0.161)	(0.170)
Links	0.240***	0.190***	0.224***
	(0.0426)	(0.0372)	(0.0224)
Tech_industry	-0.203**	-0.0380	0.146*
	(0.0909)	(0.0745)	(0.0762)
Constant	3.644***	4.389***	4.672***
	(0.208)	(0.155)	(0.103)
Number of Obs	1,072	1,072	1,072
Pseudo R-squared	0.0896	0.0855	0.1078

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table X: Analyses of the impact of founders' human capital on the success of ECF campaigns measured by *ln-investors, using* Quantile regressions.

	Model 1 (Q25)	Model 2 (Q50)	Model 3 (Q75)
Education-in-the-field	0.318***	0.302***	0.253**
	(0.104)	(0.0924)	(0.109)
Experience-in-the-field	0.00204	0.116	0.102
	(0.128)	(0.106)	(0.106)
Entrepreneurial-experience	0.0111	0.00624	0.130
	(0.129)	(0.0828)	(0.0935)
Female_founder	-0.0901	-0.124	-0.220**
	(0.0901)	(0.0971)	(0.102)
Covid-19	0.258**	0.230***	0.295***
	(0.109)	(0.0880)	(0.101)
Core_team	0.0629***	0.0633***	0.0471***
	(0.0139)	(0.0105)	(0.0145)
Ethnical_minority	-0.172	0.0607	-0.0820
	(0.314)	(0.141)	(0.136)
Links	0.231***	0.209***	0.228***
	(0.0442)	(0.0402)	(0.0286)
Tech_industry	-0.250***	-0.179**	0.0265
	(0.0743)	(0.0871)	(0.0708)
Constant	3.637***	4.255***	4.677***
	(0.243)	(0.225)	(0.174)
Number of Obs	1,072	1,072	1,072
Pseudo R-squared	0.1007	0.1012	0.1180

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

The second topic addresses the gender gap in human capital. This is explored by separately replacing *female-founder* with *female-leadership* (models 1 and 3 in Table XI) and *Percent-female* (models 2 and 4 in Table XI). *Female-leadership* is a dummy variable that takes the value of 1 when more than half of the core team consists of women. *Percent-female* represents the percentage of women in the core team. The findings reported in Table XI are consistent with those presented in Tables V and VI, indicating that the success of an ECF campaign–measured by the number of

investors and the amount of capital raised–decreases with a higher proportion of women among the core team members. As a result, the impact of gender differences in ECF remains negative.

Table XI: Analyses of the impact of the presence of women on the success of ECF campaigns measured by *ln-investors and ln-raised,* using OLS regressions. *Female-founder* is replaced, separately, with *female leadership* and *percent-female*.

	Model 1 (ln-investors)	**Model 2** (ln-investors)	**Model 3** (ln-raised)	**Model 4** (ln-raised)
Female-leadership	-0.299**		-0.327**	
	(0.0950)		(0.118)	
Percent-female		-0.360***		-0.385**
		(0.0757)		(0.169)
Covid	-0.639***	-0.580**	-1.043***	-0.980***
	(0.169)	(0.187)	(0.127)	(0.131)
Core-team	0.0676***	0.0687***	0.0776***	0.0788***
	(0.0174)	(0.0180)	(0.0130)	(0.0135)
Ethnic-minority	-0.186	-0.163	-0.228*	-0.204
	(0.207)	(0.206)	(0.125)	(0.120)
Links	0.245***	0.248***	0.120***	0.123***
	(0.0404)	(0.0409)	(0.0313)	(0.0316)
Tech-industry	-0.000317	-0.0188	0.299*	0.280
	(0.140)	(0.140)	(0.146)	(0.156)
Constant	3.976***	3.914***	5.505***	5.438***
	(0.218)	(0.215)	(0.375)	(0.366)
Number of Obs	1,072	1,072	1,072	1,072
R-squared	0.253	0.252	0.237	0.236
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table XII adds a dummy variable, *University*, which takes the value of 1 if a lead founder is a graduate of one of the 100 highest-ranked universities in the world[6]. This variable is significantly positive at levels of 1% and 5%. Specifically, being educated at a university ranked among the top 100 in the world tends to attract more investors and more funds. The impact of lead founders' educational background on the success of ECF campaigns is consistent with the findings presented in Tables V and VI. Accordingly, human capital conveys strong signals that enhance the likelihood of attracting investors. Overall, our findings align with those discussed in Tables V and VI.

Table XII: Analyses of the impact of founders' education on the success of ECF campaigns measured by *ln-investors and ln-raised, using* OLS regressions. The dummy *University* is included in the analyses.

	Model 1 (ln-investors)	**Model 3 (ln-raised)**
Education-in-the-field	0.401***	0.260***
	(0.0689)	(0.0757)
University	0.134**	0.208***
	(0.0655)	(0.0723)
Covid-19	-0.651***	-0.998***
	(0.100)	(0.230)
Core-team	0.0632***	0.0745***
	(0.00899)	(0.0117)
Ethnic-minority	-0.162	-0.204
	(0.162)	(0.143)
Links	0.241***	0.118***
	(0.0273)	(0.0383)
Tech-industry	-0.109	0.234***
	(0.0679)	(0.0726)
Constant	4.003***	5.337***
	(0.220)	(0.320)

[6] According to the QS world university ranking

Number of Obs	1,072	1,072
R-squared	0.277	0.248
Year-effects	Yes	Yes
Country-effects	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Based on signaling theory and previous literature that emphasizes the role of signals (such as founder backgrounds) in the success of ECF campaigns, we incorporate a dummy variable named *biography* equals to one if the campaign page discloses a biography mentioning educational and/or professional backgrounds of the lead founder. By incorporating this variable, we empirically examine whether a venture that provides information about founder's backgrounds, easily accessible on the campaign page, performs better to attract more funds and more investors compared to a venture that does not disclose such information.

We find a positive impact of *biography* on attracting a greater number of investors supporting the campaign, as well as a higher amount of capital raised. These findings provide evidence that the disclosure of such information impacts investor behavior differently and enhance investor trust compared to information collected from external sources. In other words, campaigns lacking founder backgrounds tend to perform worse due to the presence of signaling gaps.

Table XIII: Analyses of the impact of founders' human capital on the success of ECF campaigns measured by *ln-investors and ln-raised, using* OLS regressions. The dummy *Biography* is included in the analyses.

	Model 1 (ln-investors)	Model 2 (ln-raised)
Biography	0.167**	0.163*
	(0.0782)	(0.0851)
Covid-19	-0.585***	-0.989***
	(0.107)	(0.180)
Core-team	0.0666***	0.0766***
	(0.00956)	(0.0121)
Ethnic-minority	-0.196	-0.239*
	(0.160)	(0.142)
links	0.226***	0.101**
	(0.0310)	(0.0416)
Tech-industry	0.0357	0.338***
	(0.0648)	(0.0708)
Constant	3.839***	5.365***
	(0.195)	(0.268)
Number of Obs	1,072	1,072
R-squared	0.251	0.234
Year-effects	Yes	Yes
Country-effects	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

While previous papers are mostly based on initial campaigns, Coakley *et al.*, (2022) argues that firms launching seasoned equity campaigns are less likely to face information asymmetry obstacles compared to those launching initial ECF campaigns. We investigate whether human capital attributes operate differently for Initial campaigns compared to Seasoned ECF campaigns.

To perform this analysis, we examine the impact of lead founders' human capital on the success of Initial and Seasoned ECF campaigns, separately, measured by *ln-investors and ln-raised.*

For initial campaigns (tables XIV and XV), the empirical results provided in tables suggest that *Education-in-the-field* attracts more investors, we also provide evidence that *Experience-in-the-field* positively impacts the number of investors as well as the amount of capital raised. Entrepreneurial-experience is insignificant across all models. For the seasoned campaigns (tables XVI and XVII), the empirical results provide evidence only for *Education-in-the-field* with respect to ln-investors. Overall, Seasoned campaigns are less sensitive to human capital signals compared to initial campaigns. Due to the higher degree of uncertainty and lack of confidence faced by potential investors, human capital signals in initial campaigns play an important role in reducing information asymmetry and build investor trust. In seasoned campaigns, performance information is available, so there are less needs to rely on human capital signals.

Table XIV: Analyses of the impact of founders' human capital on the success of initial ECF campaigns measured by *ln-investors, using* OLS regressions.

	Model 1	**Model 2**	**Model 3**	**Model 4**
Education-in-the-field	0.288**			0.257***
	(0.108)			(0.0818)
Experience-in-the-field		0.170**		0.0377
		(0.0570)		(0.0818)
Entrepreneurial-experience		-0.0113		-0.00616
		(0.100)		(0.0703)
Female-founder			-0.205***	-0.181**
			(0.0405)	(0.0767)
Covid-19	-0.671***	-0.548***	-0.333**	-0.582
	(0.168)	(0.105)	(0.112)	(0.850)
Core-team	0.0524**	0.0505**	0.0500**	0.0495***
	(0.0215)	(0.0212)	(0.0222)	(0.0111)
Ethnic-minority	0.0272	0.0160	0.0357	0.0461
	(0.0966)	(0.107)	(0.0891)	(0.150)

Links	0.132*** (0.0380)	0.139*** (0.0393)	0.137*** (0.0411)	0.135*** (0.0297)
Tech-industry	-0.0277 (0.0891)	0.0347 (0.107)	0.0174 (0.114)	-0.0632 (0.0778)
Constant	4.758*** (0.183)	4.378*** (0.348)	4.353*** (0.223)	4.663*** (1.208)
Number of Obs	656	656	656	656
R-squared	0.301	0.290	0.291	0.308
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table XV: Analyses of the impact of founders' human capital on the success of initial ECF campaigns measured by *ln-raised, using* OLS regressions.

	Model 1	**Model 2**	**Model 3**	**Model 4**
Education-in-the-field	0.279 (0.164)			0.154 (0.145)
Experience-in-the-field		0.324** (0.127)		0.243** (0.0821)
Entrepreneurial-experience		-0.0331 (0.0810)		-0.0311 (0.0818)
Female-founder			-0.159* (0.0723)	-0.128 (0.0724)
Covid-19	-1.303*** (0.274)	-1.293*** (0.207)	-0.996*** (0.220)	-1.304*** (0.277)
Core-team	0.0807***	0.0767***	0.0789***	0.0759***

	(0.0172)	(0.0192)	(0.0202)	(0.0199)
Ethnic-minority	-0.0314 (0.111)	-0.0403 (0.107)	-0.0276 (0.105)	-0.0202 (0.113)
Links	0.106** (0.0463)	0.116** (0.0450)	0.110** (0.0493)	0.114** (0.0448)
Tech-industry	0.125 (0.0993)	0.160 (0.127)	0.177 (0.148)	0.0974 (0.0922)
Constant	6.013*** (0.299)	5.627*** (0.298)	5.632*** (0.299)	5.794*** (0.298)
Number of Obs	656	656	656	656
R-squared	0.247	0.251	0.239	0.257
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table XVI: Analyses of the impact of founders' human capital on the success of Follow-on ECF campaigns measured by *ln-investors, using* OLS regressions.

	Model 1	**Model 2**	**Model 3**	**Model 4**
Education-in-the-field	0.505** (0.187)			0.596*** (0.163)
Experience-in-the-field		0.157 (0.148)		-0.182 (0.103)
Entrepreneurial-experience		-0.0316 (0.0901)		0.0672 (0.136)

Female-founder			-0.325*	-0.311*
			(0.169)	(0.144)
Covid-19	-0.536***	-0.673***	-0.682***	-0.533***
	(0.146)	(0.183)	(0.149)	(0.144)
Core-team	0.0801***	0.0891***	0.0854***	0.0746***
	(0.0140)	(0.0161)	(0.0168)	(0.0131)
Ethnic-minority	-1.084*	-1.086**	-1.028*	-1.036*
	(0.499)	(0.478)	(0.497)	(0.515)
Links	0.384***	0.389***	0.399***	0.394***
	(0.0447)	(0.0454)	(0.0525)	(0.0540)
Tech-industry	-0.174	-0.000247	-0.0618	-0.264**
	(0.120)	(0.178)	(0.153)	(0.101)
Constant	3.097***	2.764***	2.928***	3.283***
	(0.209)	(0.425)	(0.282)	(0.286)
Number of Obs	416	416	416	416
R-squared	0.385	0.362	0.367	0.394
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

Table XVII: Analyses of the impact of founders' human capital on the success of Follow-on ECF campaigns measured by *ln-raised, using* OLS regressions.

	Model 1	Model 2	Model 3	Model 4
Education-in-the-field	0.280 (0.175)			0.332 (0.235)
Experience-in-the-field		0.0722 (0.0833)		-0.113 (0.162)
Entrepreneurial-experience		-0.237 (0.162)		-0.186 (0.150)
Female-founder			-0.182 (0.140)	-0.142 (0.114)
Covid-19	-0.636*** (0.107)	-0.633*** (0.140)	-0.717*** (0.139)	-0.559*** (0.125)
Core-team	0.0674*** (0.0192)	0.0743*** (0.0227)	0.0703*** (0.0177)	0.0667*** (0.0197)
Ethnic-minority	-0.687* (0.338)	-0.637** (0.282)	-0.655* (0.298)	-0.617** (0.272)
Links	0.149** (0.0657)	0.148* (0.0697)	0.157* (0.0708)	0.150* (0.0743)
Tech-industry	0.394*** (0.100)	0.493*** (0.153)	0.455** (0.149)	0.353*** (0.0765)
Constant	3.283*** (0.259)	3.337*** (0.365)	3.189*** (0.345)	3.618*** (0.232)

Number of Obs	416	416	416	416
R-squared	0.274	0.273	0.269	0.282
Year-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes

Heteroscedasticity-robust standard errors are in parentheses *, **, ***. Show statistical significance at the level of 1%, 5%, and 10%, respectively.

6. Discussion and Conclusion

The aforementioned analyses enable us to explain the role of founders' human capital signals in the success of ECF campaigns, measured by the number of investors and the amount of capital raised. By leveraging signaling theory, we enhance the literature by using a dataset that includes both initial and seasoned campaigns from four ECF platforms: Republic and Crowdcube from the UK, Mamacrowd from Italy, and Invesdor from Finland, covering the period from 2014 to 2024. We follow Piva and Rossi Lamastra (2018), Lim and Busenitz (2020), Coakley *et al.*, (2022), and Troise *et al.* (2022) in positioning the founder as central to our analyses. The present study delves deeper, focusing primarily on the lead founder.

Overall, our results yield several conclusions, indicating that the founders' education and previous professional experience are significant factors in campaign success. This confirms the argument that these human capital indicators send credible signals to uninformed investors and help reduce information asymmetry. Specifically, a founder's education in the same fields in which the firm operates has a positive impact on attracting a greater number of investors and a higher amount of capital raised. In other words, such a founder possesses the necessary knowledge and skills to navigate specific technical difficulties related to the venture's industry, apply industry-specific technologies, and comprehend the demands of industry-specific clients. As a result, the founder can effectively run the venture (Lofstrom *et al.* 2014). This can boost investors' confidence, encouraging them to invest more. In addition, a founder with prior working experience in the same field as the firm's industry is familiar with its environment (similar argument is presented by Cohen and Dean, 2005). In other words, such a founder can improve the capability to identify opportunities within the industry (Feeser and Willard, 1990) by possessing deep expertise in

technologies, production methods, competitive dynamics, and other relevant areas specific to the venture's industry (for example Gimeno et al., 1997; Burton *et al.*, 2002; Behrens *et al.*, 2012). Furthermore, by having previously worked in a related industry, the founder has likely established social connections with suppliers, consumers, and other key stakeholders within the industry, which can potentially benefit the venture (Piva and Rossi Lamastra, 2018). Accordingly, investors tend to place greater trustworthiness in founders who have a solid professional background in the relevant industry and are willing to pledge funds. Our results contrast with those of Piva and Rossi Lamastra, (2018) and Troise *et al.* (2022). This may be due to the evolution of the ECF landscape, particularly regarding market dynamics and investor behavior. Indeed, investors' preferences may have shifted, leading them to favor founders with education and experience in industries related to their ventures. Geographical focus may also affect outcomes. Additionally, this could be related to the rise in the number of campaigns in recent years, which allowed us to expand our sample to examine not only initial campaigns but also seasoned ones. However, our results reveal insignificant evidence that entrepreneurial experience contributes to the success of ECF campaigns, which aligns with the findings of Lim and Busenitz (2020).

Our paper also sheds light on how gender differences impact the likelihood of campaign success. Specifically, we find that businesses owned by women tend to receive smaller amount of capital from a smaller number of investors compared to those owned by men. In other words, investors participating in ECF may exhibit behaviors and preferences that align with those in traditional forms of financing, favoring ventures led by men (Vismara *et al.*, 2017; Geiger and Oranburg, 2018). One reason for this disparity may be attributed to differences between men and women in areas such as networks, human capital, growth goals, and the nature of firms run by each gender (Carter and Rosa, 1998). Women are likely to possess less prior managerial or entrepreneurial experience and are also less likely to engage in networks with affluent individuals (Verheul and Thurik, 2001). Our paper provides evidence that the disclosure of information related to educational and/or professional backgrounds positively affects the number of investors and the amount of equity raised compared to information collected from external sources. We also investigate that, due to the higher degree of uncertainty and lack of confidence faced by potential investors, founders' human capital attributes operate better for Initial campaigns compared to Seasoned ECF campaigns.

Our findings have important implications for entrepreneurs seeking equity financing and for investors aiming to understand market dynamics. Entrepreneurs can enhance their chances of success by providing online information about their human capital characteristics. This practice reduces ambiguity and helps potential investors recognize the unobserved qualities of the businesses. This is particularly relevant for founders who possess educational backgrounds and previous work experience in fields related to their firms' industries. Our study may be of interest to individuals and institutions that currently operate ECF platforms. They could improve their processes of due diligence by placing greater emphasis on lead the founders' human capital. They should, for instance, require lead founders to provide information about their education and professional experience in an organized format that is immediately accessible on the campaign pages mainly for initial campaigns. This can help reduce asymmetric information, attract more investors, raise greater amounts of capital, and create sustainability in the ECF market. For seasoned campaigns, platforms may incentivize firms to provide previous funding outcomes or track records rather than human capital backgrounds. Additionally, our results could prompt calls for policymakers to mandate the disclosure of founders' backgrounds. This may protect investors against information asymmetry. Our findings may also encourage policymakers to support initiatives that incentivize and prioritize funding for women-led businesses. Platforms may also publish some success stories about firms initiated by women, which can help raise awareness of women's capabilities and potential.

As with any study, ours is not without limitations. Our data includes only successful campaigns, as data concerning offerings that did not meet the target capital is removed from the platforms. As a result, we cannot provide additional robustness checks using, for instance, probit or logit models to estimate the probability of *success*[7]. Additionally, this may indicate the possibility of selection bias. However, this is unlikely to affect our results, as it is highly improbable that factors attracting a greater number of investors and resulting in better funding amounts would negatively influence the likelihood of success (Barbi and Mattioli, 2019). New techniques for gathering data are needed to enable future studies to systematically monitor and identify failed campaigns before their removal by platform managers. Another direction that may enrich our investigations is comparing

[7] A dummy variable that equals 1 if the amount raised meet the target capital, 0 otherwise

campaigns initiated by firms at different levels of evolution or in various industries. Expanding our analyses to include other geographies could also be interesting.

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