



**EQUITY CROWDFUNDING:
AN ALTERNATIVE WAY OF STARTUP FINANCING**

by

Sandra Isabel dos Santos Correia

Doctoral Thesis in Business and Management Studies
Concentration area: Finance

Supervised by

Miguel Augusto Gomes Sousa
Elísio Fernando Moreira Brandão

2022

BIOGRAPHICAL NOTE

Sandra Isabel dos Santos Correia was born on July 22, 1977, in Castelo de Paiva, Portugal.

She concluded her undergraduate studies in Economics in 2000 and her Master's in Finance in 2012, both at the School of Economics and Management of the University of Porto. Her MSc dissertation “As determinantes da maturidade da dívida” was supervised by Professor Manuel de Oliveira Marques. In 2013, she enrolled in the school's Doctoral Programme in Management, specialisation in Finance.

Since 2000, she has been working as a business consultant in the areas of investment analysis, management control and company valuation at the company I.F. – Inovação Financeira, Lda. She has been a partner of the company since 2014.

Between 2010 and 2015, she worked as assistant lecturer in the courses Investment Analysis, Accounting, Finance Mathematics, Economy, and Business Plans at ISMAI – Instituto Universitário da Maia.

Since 2013, she wrote, regularly, articles on Corporate Finance for the monthly newsletter “Boletim Economia e Empresas” (until 2015) and the specialized tax and economics newspaper “O Informador Fiscal” (until 2018). She also published three articles on the journal *Revista Portuguesa de Contabilidade*: “O prémio de risco nos modelos de avaliação” (2011), “O Crowdfunding e o Financiamento das *Startups*” (2013), and “Qual o desempenho económico-financeiro da minha empresa?” (2014).

Her research on Corporate Debt Maturity and Equity Crowdfunding was presented in several conferences, such as Paris Financial Management Conference (2014), International Finance and Bank Society Porto Conference (July 2018), 2nd PhD Student Workshop in Economics and Business Administration at the University of Minho (June 2019), Annual Conference of the Multinational Finance Society (July 2019 and July 2022), Interdisciplinary European Conference on Entrepreneurship Research - a Virtual Community Conversation (October 2020) and World Finance & Banking Symposium (December 2020 and December 2021).

ACKNOWLEDGEMENTS

I express my deepest gratitude to my research supervisors, Professor Miguel Sousa and Professor Elísio Brandão, for their guidance, assistance, and advice throughout these years.

My grateful thanks extend to all the participants at the conferences I attended and to the editor and anonymous referee of the Venture Capital Journal for their valuable suggestions.

To my family, especially my son André and my husband António, for their support and understanding of my absence.

I extend my thanks to my colleagues at I.F. – Inovação Financeira for their encouragement and support throughout this journey.

ABSTRACT

This thesis includes three essays on Equity Crowdfunding (ECF), the most complex and structured crowdfunding model ([Bruton, Khavul, Siegel, & Wright, 2015](#)). With our research, we expect to contribute to a better understanding of this new financing model for start-ups.

Since the publication of the first paper in 2010, there has been an explosion of academic papers on ECF, particularly in recent years. Although there are some (few) papers of literature review of ECF, they are outdated and usually focused on a specific topic. Thus, our first essay provides a comprehensive and up-to-date systematisation of the existing ECF literature, identifying some inconsistencies and gaps and providing clues for further investigation.

The second essay explores the effect of competition on the success of ECF campaigns. Overall, we found that the competitive environment can influence the definition of the strategy of entrepreneurs to enhance the probability of success of ECF campaigns, including the decision on the best time to start or end the campaign, as well as to capture the attention of potential investors.

In the last essay, we investigated the follow-on funding and probability of survival of firms that participated in ECF campaigns (successfully or not). We found that, as in venture capital, entrepreneurs in ECF opt for phasing the funding to mitigate moral hazard problems and obtain relevant information from the previous financing rounds that they use to adjust their financing strategy. The results of the multivariate analysis suggest that the characteristics and outcomes of the ECF campaigns influence the ability of firms to get follow-on funding and firm survival. However, the results are different when we split the sample between the firms that were successful in the ECF campaign and those that were not, confirming the relevance of including firms with unsuccessful ECF campaigns in the research.

JEL Classification Codes: G30, G33, L26, M13.

Keywords: Equity Crowdfunding, Alternative Finance, Competition, Firm Survival, Firm Failure, Follow-on Funding.

RESUMO

Esta tese inclui três ensaios sobre Equity Crowdfunding (ECF), o modelo mais complexo e estruturado de Crowdfunding. Com esta investigação, procuramos contribuir para uma melhor compreensão sobre este novo modelo de financiamento das start-ups.

Desde a publicação do primeiro artigo em 2010, que se assistiu a uma explosão de artigos académicos sobre ECF, em particular nos últimos anos. Assim, e apesar de existirem alguns (poucos) artigos de revisão de literatura, estes encontram-se desatualizados e normalmente focam-se apenas num tópico específico do financiamento por ECF. Assim, no primeiro artigo apresentamos uma sistematização abrangente e atualizada da literatura existente sobre ECF, o que nos permitiu identificar algumas inconsistências e lacunas, fornecendo pistas para investigações futuras.

O segundo ensaio explora o efeito da competição no sucesso das campanhas de ECF. Em termos gerais, constatamos que o ambiente competitivo pode influenciar a estratégia dos empreendedores tendo em vista o aumento da probabilidade de sucesso das campanhas de ECF, incluindo quer a decisão sobre o melhor momento para iniciar ou terminar a campanha, quer o modo de potenciar a atenção de potenciais investidores.

No último ensaio, investigamos a probabilidade de financiamento subsequente e sobrevivência das empresas que participaram em campanhas de ECF (com ou sem sucesso). Constatamos que, tal como no financiamento por capital de risco, no mercado de ECF os empreendedores optam por utilizar várias rondas de financiamento de modo a mitigar os problemas de risco moral e a obter informações relevantes que lhes permitam ajustar a sua estratégia de financiamento. Os resultados sugerem ainda que as características e resultados das campanhas de ECF influenciam a capacidade das empresas obterem financiamento subsequente e a sua sobrevivência. Porém, os resultados são diferentes quando analisamos separadamente as subamostras das empresas que tiveram sucesso na primeira campanha de ECF e das que não foram bem-sucedidas, confirmando a relevância de incluir na investigação as empresas sem sucesso nas campanhas de ECF.

Códigos de classificação JEL: G30, G33, L26, M13.

Palavras-chave: Equity crowdfunding, financiamento alternativo, concorrência, sobrevivência das empresas, falência das empresas, financiamento subsequente.

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ACRONYMS AND ABBREVIATIONS

AAGR - Average Annual Growth Rate

B2C – Business to Consumer

BA – Business Angels

CGT – Capital Gains Tax

EBITDA – Earnings Before Interests Depreciation and Amortisation

ECF – Equity Crowdfunding

EIS - Enterprise Investment Scheme

F&F – Family and Friends

IPO – Initial Public Offering

M&A – Mergers & Acquisitions

MBA – Master of Business Administration

NACE - European Classification of Economic Activities

Q&A – Questions and Answers

R&D – Research and Development

SECO- Seasoned Equity Crowdfunding Offerings

SEIS - Seed Enterprise Investment Scheme

SEO - Seasoned Equity Offerings

SME – Small and Medium-sized Enterprise

UK – United Kingdom

USA – United States of America

VC – Venture Capital

VIF - Variance Inflation Factor

1. INTRODUCTION

“Alternative forms of entrepreneurial finance are proliferating, yet our understanding of them remains in its infancy.” ([Bruton et al., 2015, p. 10](#))

Start-ups have unique characteristics that influence their financing options. Given the lack of history and credible reputation ([Huyghebaert & Van de Gucht, 2007](#)), start-ups have higher information asymmetries and agency costs (between entrepreneurs and investors), which have three significant consequences. First, investors use signals (such as personality traits of entrepreneurs, net worth, education, and professional experience) to evaluate the quality of projects and entrepreneurs ([Coleman, Cotei, & Farhat, 2016](#)). Second, start-ups have no access to the full range of equity and debt financing options, and third, they face higher financing costs, and funders require more (personal) collateral ([Cassar, 2004](#)).

Start-ups usually have high growth potential and reduced cash flows, so they need external financing to develop their products and expand their business. Although creditors may be concerned about selection adverse and risk-shifting problems, they are also interested in investing in a long-term credit relationship with start-ups ([Cassar, 2004](#)). To reduce the high risk of start-ups derived from adverse selection and moral hazard problems, banks limit the size and maturity of loans ([Huyghebaert & Van de Gucht, 2007](#)) and ask for outside collateral, such as personal assets ([Coleman et al., 2016](#)). In addition, as ownership and management are generally not separated, the start-ups use less bank debt and prefer other capital sources with less strict rules of liquidation ([Huyghebaert & Van de Gucht, 2007](#)).

This way, SMEs and start-ups have distinctive characteristics that reduce their ability to access the capital market or bank funding. These limitations induce the start-ups to use other sources of financing, such as personal savings, loans from family and friends, trade credits, venture capital or business angels (hereafter VC or BA) and, more recently, crowdfunding.

Crowdfunding is a funding model where entrepreneurs and start-ups receive (small) contributions from a potentially large number of individuals in exchange for some

compensation, usually through an internet platform¹, without standard financial intermediaries, for financing their projects. Initially, crowdfunding was devoted to offering gifts/rewards for arts and entertainment projects. However, more recently, more complex and structured campaigns have been developed ([Bruton et al., 2015](#)).

Crowdfunding is usually classified into four models, depending on the compensation offered: donation, reward, lending, and equity. Our research is focused on Equity Crowdfunding² (hereafter ECF), the most complex and structured crowdfunding model ([Bruton et al., 2015](#)), where entrepreneurs' decision is essentially a financing one. In other crowdfunding models (e.g. reward), it could be an operational decision that affects sales and production levels, which is more suitable for low funding needs ([Belleflamme, Lambert, & Schwienbacher, 2014](#)). In ECF, entrepreneurs usually offer equity shares or, in some cases, a fraction of revenue or profits for funding the campaign. Usually is used the “all-or-nothing” model, according to which if the funding target is not reached, the firm does not receive anything ([Belleflamme, Omrani, & Peitz, 2015](#)). The ECF model is particularly relevant for research in entrepreneurship finance because, instead of social responsibility and identification with the project (as in donation-crowdfunding) or pre-purchasing (as in reward-crowdfunding), the potential monetary returns (future dividends and capital gains) are the main investors' motivation³ ([Ahlers, Cumming, Günther, & Schweizer, 2015](#)). In this context, [Ahlers et al. \(2015\)](#) define the ECF as “*a method of financing, whereby an entrepreneur sells a specified amount of equity or bond-like shares in a company to a group of (small) investors through an open call for funding on Internet-based platforms*” ([Ahlers et al., 2015](#)), p. 4).

The equity-crowdfunded firms combine characteristics of public and private firms. As public firms, equity-crowdfunded firms have many small shareholders, and, as private firms, entrepreneurs retain a large share of equity ([Cumming, Vanacker, & Zahra, 2021](#)). Compared to traditional sources of capital used by start-ups (such as VC/BA), ECF is characterised by many investors, primarily unsophisticated and less wealthy than the traditional ones.

¹ While crowdfunding campaigns often use an internet platform as an intermediary, there are also some cases of individual crowdfunding practices in which the entrepreneurs fund their projects directly without the intermediation of a crowdfunding platform ([Belleflamme, Lambert, & Schwienbacher, 2013](#)).

² In the literature, equity crowdfunding is also referred to as crowdinvesting, investment-based crowdfunding or securities crowdfunding.

³ In the literature, we find different expressions for the individuals/firms seeking capital (entrepreneurs, creators, founders, start-ups) and to who provide capital (investors, funders, contributors). Given the nature of ECF, we prefer to use the expressions entrepreneurs or start-ups and investors.

Additionally, instead of face-to-face interactions, entrepreneurs and investors relate to each other through an online platform. These characteristics have many consequences regarding investment selection, contracting process and business monitoring, as we will discuss later.

In sum, many funders, small contributions, non-sophistication of investors and the geography of investments are just some of the main differences from traditional financing sources for start-ups, making ECF an exciting research topic.

Thus, our thesis focuses on Equity Crowdfunding, the most complex and structured crowdfunding model ([Bruton et al., 2015](#)). With our research, we expect to contribute to a better understanding of ECF and evaluate if this alternative way of funding can help reduce start-ups' financial gap ([OECD, 2014](#)). The thesis is divided into three chapters. The first one is a systematic review of literature about ECF. The second paper explores the determinants of ECF campaigns' success, focusing on the role of competition in campaign success. Finally, in the last chapter, we investigate the failure and follow-on funding of firms with ECF campaigns (successfully or not).

Since the first paper on ECF was published in 2010, the number of publications has grown exponentially, currently counting several hundred papers⁴ and covering a wide range of topics. Although there are already some (few) papers reviewing the literature on equity crowdfunding ([Drover, Busenitz, et al., 2017](#); [Martínez-Climent, Zorio-Grima, & Ribeiro-Soriano, 2018](#); [Schwienbacher, 2019](#)), our paper stands out for several reasons. First, as most of them were published more than three years ago, given the explosion of the published papers during the last years (for instance, around 50% of the papers included in our literature review were published since 2020), they are out of date. Second, some of them are restricted to one topic of ECF ([Cumming, Vanacker, et al., 2021](#)) and, with one exception ([Mochkabadi & Volkmann, 2018](#)), they do not use a systematic literature review approach. In this way, our review contributes to the ECF literature by providing an up-to-date systematisation of the literature on ECF. It also identifies some inconsistencies and gaps in the existing literature, providing some clues for further investigation.

⁴ In the search for our literature review, we identified in the databases Scopus and Web of Science more than four hundred English-published papers in the subject areas of Business, Management, Economics and Finance (after excluding duplicates).

In the second chapter, we investigate the role of competition on the performance of equity crowdfunding campaigns. Prior studies in the context of entrepreneurship emphasise the competition relevance for firm performance ([Hernández-Carrión, Camarero-Izquierdo, & Gutiérrez-Cillán, 2017](#); [Nickell, 1996](#); [Nocke, 2006](#)), product and process innovation ([Boone, 2000](#); [Spulber, 2010](#)), entrepreneurs' decision of entry and exit the industry ([Spulber, 2010](#)) and to the allocation of resources to the most efficient firms ([Olley & Pakes, 1996](#)). Our work extends competition research into fundraising, arguing that competition may also influence the outcomes of ECF campaigns. The previous research in equity crowdfunding is mainly focused on the determinants of campaign success, but surprisingly the role of competition among projects has been neglected. A few empirical papers on ECF consider competition among the independent variables, and even in these cases, competition is usually used only as a control variable of the drivers of fundraising success ([Block, Hornuf, & Moritz, 2018](#); [Kleinert & Volkmann, 2019](#); [Vismara, 2018](#)), or as an instrumental variable ([Coakley, Lazos, & Linares-Zegarra, 2018](#); [Signori & Vismara, 2018](#)). So, to our knowledge, this is the first paper exploring the competition effect on the outcomes of ECF campaigns. Since there are no databases about crowdfunding campaigns and the public information on ECF platforms is very limited and restricted to successful campaigns, we use a unique hand-collected database. Our sample includes 1,487 campaigns and 66,180 daily observations from the two biggest ECF platforms in the UK (Seedrs and Crowdcube) between 2015 and 2018.

To analyse the competition effect on fundraising success, we use a logistic regression, where the dependent variable is a dummy variable for success. Our main goal is to analyse the impact of competition on the performance of ECF campaigns, but, according to the literature review, we also control for projects and teams' characteristics, information disclosure, other motivations, and early investment.

Then, we also use daily observations from each campaign to construct several panel data models to analyse the effect of competition variables on the daily investment raised amount and the daily number of investors.

In addition to contributing to a better understanding of ECF in general, our study provides some valuable indications to entrepreneurs and platforms to ensure a higher probability of

success of their campaigns. We do not find evidence supporting our first hypothesis that the number of competing campaigns influences the likelihood of a campaign being funded. Still, we cannot also say that the number of competitors is entirely irrelevant. We find evidence that day by day, the number of competitors plays a relevant role in the campaign performance, both in terms of the number of investors and the amount raised. Moreover, the number of competing campaigns has a significant negative effect on the total number of campaign investors at the end of the campaign. We also find evidence that the presence of blockbuster projects has a cannibalization effect on the campaigns of other industries, stealing investors and reducing the probability of a campaign being successful.

Overall, in this chapter, we find that the competitive environment can influence the definition of the best strategy for entrepreneurs to enhance the probability of success of equity crowdfunding campaigns, including the decision about the best time for starting or exiting the campaign and how to capture the attention of potential funders.

In the third chapter, we investigate the post-campaign outcomes of firms participating in equity crowdfunding in terms of firm failure and follow-on financing. In addition to this being a recent and still little explored topic in ECF ([Bouaïss, Girard, & Zopounidis, 2020](#); [Butticè, Di Pietro, & Tenca, 2020](#); [Cumming, Meoli, & Vismara, 2019](#); [Signori & Vismara, 2018](#); [Walthoff-Born, Vanacker, & Collewaert, 2018](#)), we extend previous research in several ways. Contrary to previous research that only included firms that obtained funding through ECF campaigns, our empirical research also includes firms that were involved in ECF campaigns but could not get the funding (firms with unsuccessful ECF campaigns). In this way, we try to overcome this literature gap, investigating how firms survive an unsuccessful ECF campaign. Then, as our sample includes all the campaigns launched on the two highest ECF platforms in the UK between April 2015 and October 2018, it avoids any selection bias related to the unsuccess of campaigns or crowdfunded firms that went to bankruptcy and subsequently suppressed from platforms databases. Finally, we also use a much larger dataset of ECF campaigns than previous studies. The sample used in our multivariate analysis includes 950 companies with ECF campaigns in Crowdcube and Seedrs, while the sample used in previous research is much lower (just two or three hundred firms).

At the time of our study, around 22.9% of firms in the sample get follow-on funding, 67% are still active, while almost 30% have been dissolved, are in liquidation or have an insolvency proceeding open. Overall, the descriptive analysis confirms that, as expected, firms with the first ECF unsuccessful have significantly lower ability to get follow-on financing after the campaign and higher failure rates than successful ones. However, these results may be explained by the ability of the crowd to select the best firms/projects (wisdom of the crowd) or by the inability of firms to get funding for their business plan. This way, we also analyse the factors that influence the follow-on financing and the survival of firms previously involved in ECF campaigns.

According to multivariate analysis, and considering the full sample, the characteristics and outcomes of the first ECF campaign (the target amount, the nominee shareholder structure and the percentage funded) seem to influence the ability of firms to get follow-on funding. However, the results are different when we split the sample between the firms that were successful in the first ECF campaign and those that were not. For the group of firms that were successful in the first ECF campaign, the characteristics, and outcomes of ECF campaigns do not significantly influence the probability of getting follow-on funding, which depends essentially on firms' and teams' characteristics. Nevertheless, for firms that failed the first ECF campaign, having a high target amount and a high percentage of funding raised significantly improves the probability of getting follow-on funding. Overall, these results confirm the relevance of including firms with unsuccessful ECF campaigns in the research samples and that the conclusions of the previous research about the effect of ECF on firm failure are not valid for firms with unsuccessful ECF campaigns.

In the analysis of the failure rate of firms involved in ECF campaigns, we find empirical evidence that the number of crowd investors, the presence of a large investor and getting subsequent funding influence positively the firm survival. Comparing the results for firms with a successful first campaign and firms with an unsuccessful first campaign, we find that the characteristics and outcomes of ECF campaigns and follow-on financing are relevant to firm failure. However, the survival of firms with a first unsuccessful ECF campaign depends only on their firm and team's characteristics and ability to get follow-on funding.

The rest of the thesis is structured as follows. In Chapter 2, we present the first paper regarding the systematic literature review of ECF research. The second paper, focused on the competition effect on ECF campaigns, is featured in Chapter 3. Chapter 4 comprises the third paper, which addresses the post-campaign outcomes of firms participating in equity crowdfunding. In the final section, we summarise the main findings, highlighting the contribution of each paper to the overall conclusion of the thesis.

2. EQUITY CROWDFUNDING: A SYSTEMATIC REVIEW OF THE LITERATURE

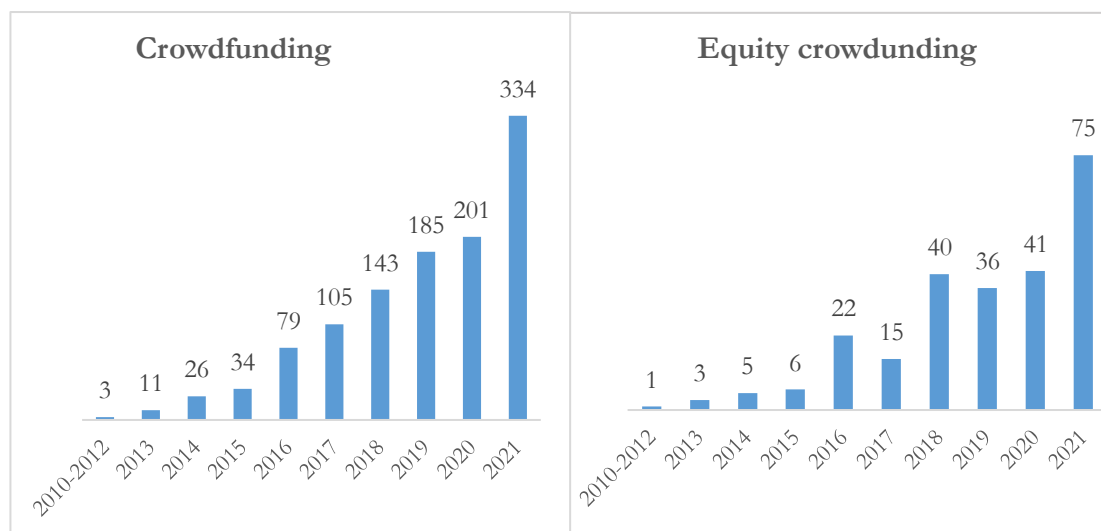
2.1. Introduction

Many studies report a financial gap for start-ups, reducing their ability to develop and grow ([OECD, 2014](#)). Furthermore, during the last financial and economic crisis (2008-2009), the deterioration of financing conditions and the growing phenomenon of disintermediation (derived from technological, social, and cultural changes) contributed to the emergence and growth of alternative sources of financing, outside the traditional financial system ([Block, Colombo, Cumming, & Vismara, 2018](#); [Wardrop, Zhang, Rau, & Gray, 2015](#)). Crowdfunding is one of those alternatives that began to assert as a popular method of obtaining funding for start-ups and Small and Medium-sized Enterprises (hereafter SMEs). Indeed, in recent years, the crowdfunding industry has experienced exponential growth worldwide [Rau \(2018\)](#), the funding through crowdfunding platforms was around \$0.5 billion in 2011, and it has grown to over \$290 billion in 2016, representing a growth rate of over 250% per annum.

However, crowdfunding has diverse funding models, usually classified into four groups: donation, reward, lending, and equity. Our paper focuses on Equity Crowdfunding (hereafter ECF), the most complex and structured crowdfunding model.

In line with the growth of the industry, in recent years, we observe a growing interest in crowdfunding research, evidenced by the number of documents published on this topic. For instance, a search in the Scopus database shows that the first paper about “crowdfunding” was published in 2010. Since then, the number of documents published by year on this subject has increased exponentially (see Figure 1).

Figure 1 - Number of new articles published about “Crowdfunding”⁵ and “Equity Crowdfunding”⁶, by year (Scopus database)



Given the growing interest in this topic, the literature about crowdfunding is vast⁷ and covers a wide range of topics. Some papers about crowdfunding were mainly descriptive, focusing on the description of the concept and its origins ([Bruton et al., 2015](#); [Schwienbacher & Larralde, 2012](#)), on the discussion of economic problems associated with crowdfunding ([Agrawal, Catalini, & Goldfarb, 2014](#)), and on the identification of the main differences between crowdfunding and traditional sources of start-up funding ([Hornuf & Schwienbacher, 2014](#)). Others focus their research on the recent developments in crowdfunding, such as syndicates ([Agrawal, Catalini, & Goldfarb, 2016](#)) and the costs and benefits of equity crowdfunding regulations in different countries ([Bradford, 2012](#); [Dibadij, 2015](#); [Hornuf & Schwienbacher, 2014, 2017](#)). Yet, the topic most discussed in the empirical research on ECF is the determinants of campaigns’ success. Many of these papers are observational studies that use (most of them hand-collect) data of campaigns from one or two ECF platforms. Others use experiments and qualitative research designs. For instance, [Cholakova and Clarysse \(2015\)](#) surveyed a group of investors to explore which financial and

⁵ Search on the Scopus database for “Crowdfunding” in the article title, abstract or keywords, limited to the areas of (i) Business, Management and Accounting or (ii) Economics, Econometrics and Finance and restricted to document type “Articles” (accessed in December 2021).

⁶ Search on Scopus database for “Equity Crowdfunding” or “Equity-based crowdfunding” in article title, abstract or keywords, limited to the areas of (i) Business, Management and Accounting or (ii) Economics, Econometrics and Finance and restricted to document type “Articles” (accessed in December 2021).

⁷ Until December of 2021, the accumulated number of articles that include the word “Crowdfunding” in the title, abstract or keywords, on the Scopus database, in the areas of (i) Business, Management and Accounting and (ii) Economics, Econometrics and Finance, is already over 1100. Even when we limit the search to “Equity Crowdfunding” or “Equity-bases crowdfunding”, the accumulated number of articles is 244.

non-financial motivations determine the decision to invest in an ECF campaign. [Ley and Weaven \(2011\)](#) use (convergent) interviews with experienced venture capitalists to identify when ECF can be appropriately used by start-ups. More recently, researchers also started to investigate the outcomes of post-campaign, in terms of failure rates of crowdfunded firms and on follow-on subsequent financing rounds ([Bessière, Stéphany, & Wirtz, 2020](#); [Coakley, Lazos, & Liñares-Zegarra, 2021](#); [Cumming, Meoli, et al., 2019](#); [Moedl, 2021](#)).

This literature review aims to provide a comprehensive and up-to-date picture of ECF research. We adopt a systematic literature review approach because it is defined as appropriate to “*synthesize research findings in a systematic, transparent, and reproducible way*” ([Snyder, 2019, p. 334](#)), and it is considered the most efficient method to identify and review extensive literature ([Tranfield, Denyer, & Smart, 2003](#)).

Following the guidelines for a systemic literature review proposed by [Tranfield et al. \(2003\)](#), the first step was the identification of the keywords and search terms. We use the search terms “Equity crowdfunding”, “Equity-based crowdfunding”, “Crowdinvesting”, and “Crowd Investing” because these terms are used interchangeably in the ECF literature. For selecting the studies for the literature review, we use two relevant bibliographic databases: Web of Science and Scopus. We limited the search to English documents and published articles (or early access) because we wanted to focus on peer-reviewed contributions. We excluded book chapters, conference papers and trade journals because of the difficulty in assessing if they were peer-reviewed. As we are only interested in topics related to Economics and Finance, we restricted the subject areas to Business, Management, Economics or Finance. According to these criteria, we found 244 documents from Web of Science and 332 from Scopus. After excluding the duplicates of both reference databases, our preliminary list consists of 402 papers.

Then, to ensure that equity crowdfunding is the paper’s main topic, we excluded those that do not have the exact phrase or synonym of search terms in the title, keywords or abstract. We also excluded editorial and literature review papers because we want to restrict the analysis to theoretical and empirical studies about equity crowdfunding. Finally, as our primary interest is in ECF’s economic and financial issues, we exclude papers focused on the regulation.

Figure 2 summarises the research protocol used for the systematic review on equity crowdfunding.

Figure 2 – Research protocol for the systematic literature review

Research protocol	
Search terms:	“Equity Crowdfunding” or “Equity-based Crowdfunding” or “Crowdinvesting” or “Crowd Investing”
Bibliographic databases	Web of Science; SCOPUS
Inclusion criteria	
Criteria	Reason
Articles are written in English	Researchers are not multilingual
Published papers	Focus on peer-reviewed contributions
Subject Areas: Business, Management, Economics or Finance	Focus on topics related to Economics and Finance
Source Type: Journal Articles and Early Access	Difficulty in assessing whether books, conference papers and trade journals were peer-reviewed
Exclusion criteria	
Criteria	Reason
Duplications	Exclude duplicated articles after merging the lists of both reference databases
No exact phrase or synonym of Search Terms in Title, Keywords and Abstract	Ensure that equity crowdfunding is the main topic
Editorials	Focus on scientific papers
Literature review	Focus on theoretical and empirical studies about equity crowdfunding
Regulation	Focus on economic and financial issues of ECF

According to the described research protocol, we select 139 papers for the literature review on ECF. As we can see in **Table 1**, the top journal on published papers about this new source of entrepreneurial finance is Small Business Economics (19), followed by the Journal of Corporate Finance and the Venture Capital Journal (with 9 papers). From the 139 papers, 118 we published in the last 5 years (since 2018).

Overall, our review makes a twofold contribution to ECF literature. First, it provides an up-to-date systematization of the literature on ECF. Second, this review identifies some inconsistencies and gaps in the existing literature, providing some clues for further investigation.

Table 1– Number of published research papers by Journal and by year

Top Journals	N° papers	Papers by year	N° papers
Small Business Economics	19	2011	1
Journal of Corporate Finance	9	2013	1
Venture Capital	9	2014	3
Entrepreneurship: Theory and Practice	8	2015	4
California Management Review	4	2016	9
Journal of Business Venturing	4	2017	3
Journal of Small Business Management	4	2018	25
Technological Forecasting and Social Change	4	2019	24
Others (69 journals)	78	2020	22
Total	139	2021	44
		2022	3
		Total	139

Although there are already some (few) papers reviewing the literature on equity crowdfunding, our paper stands out for several reasons. Some were published more than three years ago ([Drover, Busenitz, et al., 2017](#); [Martínez-Climent et al., 2018](#); [Schwienbacher, 2019](#)) and given the explosion of the literature in recent years, they are out of date. Others are focused on the study of the effective governance mechanisms of equity-crowdfunded firms and how it relates to the viability and long-term success of these firms ([Cumming, Vanacker, et al., 2021](#)). Then, to our knowledge, there is only another paper using a systematic literature review approach ([Mochkabadi & Volkmann, 2018](#)), but that reviews 113 journal contributions and other papers published until 2017, i.e., excludes the most recent research in ECF. Thus, to our best knowledge, this is the most up-to-date systematic literature review paper covering a diverse set of ECF topics.

In the next sections, we will discuss in detail the main findings of the research in ECF until now. Given the wide range of topics discussed in ECF literature, we organise the literature review according to the investment process. We start with a brief characterization of ECF, highlighting the main differences between VC/BA and crowd investors. In chapter 2.3 we try to understand why and when entrepreneurs prefer ECF over other sources of entrepreneurial finance. In the next chapter, we describe the platform models of ECF and how the differences across ECF platforms can influence the success of the campaigns and post-campaign firm outcomes. Chapter 2.5 is dedicated to the empirical research on the

determinants of campaigns' success. We start this topic by discussing the drivers of fundraising success related to the supply side of the ECF market (campaigns), such as the signals of the quality of projects and entrepreneurs (campaigns characteristics, human capital, and social capital), the information disclosure, the non-financial rewards, and the dynamics of the investment process (campaign dynamics and competition). Then, we look at crowd investors-related factors, like investors' heterogeneity, investors' biases, and the relevance of constructing trust relations and offering risk options to crowd investors. We conclude this topic by discussing the impact of country-level characteristics on ECF market development and investment decisions. Finally, the last chapter of this literature review is dedicated to the post-investment phase, where we analyse the post-campaign outcomes in terms of failure rate, follow-on funding, and firm performance.

At the end of each chapter, we present a summary of the previous research works on that topic. For each paper, we identify the research design, the data used in empirical research (when applicable), and a summary of the most relevant research findings and conclusions. As some of the papers simultaneously investigate more than one topic addressed in our literature review, to avoid duplicating the document in more than one table, we opt to present it only in the first topic discussed.

2.2. Comparison of ECF with traditional funding sources for start-ups (VC/BA)

SMEs and start-ups have distinctive characteristics that difficult their access to some sources of capital, such as capital market and bank credit. Thus, in addition to family and friends, Venture Capitalists (VC) and Business Angels (BA) are traditionally the main funders of start-ups.

While there are several differences between Business Angels and Venture Capitalists in terms of company stage focus, investment size, investment time horizon, and return on investment expectation, among other features ([Morrissette, 2007](#)), both are usually sophisticated investors that acquire a share on high growth potential start-ups, intending to get dividends or capital gains in the future. Additionally, there is some evidence that angels and venture capitalists are dynamic funding substitutes, i.e., firms financed by BA are less likely to be financed by VC in subsequent financing rounds, and vice-versa ([Hellmann, Schure, & Vo, 2017](#)). This way, for the comparison between the traditional sources of equity financing of start-ups and ECF, we do not distinguish between BA and VC.

Given the high risk of start-ups and the existence of information asymmetries, venture funders face problems of adverse selection and moral hazards ([Van Osnabrugge, 2000](#)). In the presence of “hidden information”, it is difficult for investors to distinguish good projects from bad ones, which can lead to adverse selection and moral hazard problems ([Agrawal et al., 2014](#)). Adverse selection ([Akerlof, 1970](#)) refers to the possibility of investors selecting low-quality projects that are presented as high-quality by entrepreneurs, while moral hazard (often described as “hidden actions”) refers to the difficulty of investors to observe if the entrepreneurs are working hard and are making the best decisions to the firm ([Amit, Brander, & Zott, 1998](#)). Even though they use different approaches to deal with agency problems, both BA and VC usually use pre-investment due diligence to deal with adverse selection problems and actively monitor the firms’ managers after the investment to reduce moral hazard issues ([Van Osnabrugge, 2000](#)). For instance, in terms of monitoring, venture capitalists usually have representation on the boards of firms ([Lerner, 1995](#)), and BA often are involved in day-to-day operations ([Van Osnabrugge, 2000](#)).

Unlike traditional forms of equity finance in entrepreneurship, ECF is characterized by the presence of high dispersion of uncredited investors (with a relatively low net worth), most of them investing only small amounts⁸. Equity crowdfunded firms have characteristics of both public and private equity firms ([Cummings, Rawhouser, Vismara, & Hamilton, 2020](#)). As public firms they have a large number of small investors and, as private firms, the entrepreneurs retain a large share of equity ([Cumming, Vanacker, et al., 2021](#)). The high dispersion of capital implies that small shareholders have little incentive to monitor the firms ([Hart, 1995](#)), and many agency problems may arise from the inherent separation of ownership and control ([Shleifer & Vishny, 1997](#)). Crowd investors don't have the same experience and knowledge to evaluate business plans and select projects/start-ups as venture capitalists and business angels ([Ahlers et al., 2015](#)). Furthermore, given the small investment amounts, the resources (time and money) needed to perform complete due diligence and monitor projects are relatively much higher for crowd investors ([Agrawal et al., 2014](#)).

Thus, while VC/BA focus on their expertise and due diligence procedures to select the ventures to fund, some argue that crowd investors use a different selection mechanism, namely the wisdom of the crowd ([Cumming, Vanacker, et al., 2021](#); [Surowiecki, 2004](#); [Walthoff-Borm, Vanacker, et al., 2018](#)).

[Walthoff-Borm, Vanacker, et al. \(2018\)](#), comparing crowdfunded firms with non-crowdfunded firms, find that both groups show similar post-campaign profitability. However, contrary to their expectations, failure rates are higher for crowdfunded firms, suggesting that the “wisdom of the crowd” does not overcome the adverse selection issues. Thus, given the lack of clear empirical evidence that the wisdom of the crowd is an effective way to reduce adverse selection and moral hazard costs, [Cumming, Vanacker, et al. \(2021\)](#) highlight the need for the use of other governance mechanisms to deal with such problems. For instance, in addition to the regulatory framework of equity crowdfunding (e.g., investor protection laws), the platform model plays a relevant role in this context. On the one hand, the due diligence conducted by platforms can be an effective governance mechanism to mitigate adverse selection problems because, given the reputational concerns, it is in their

⁸ For instance, [Vulkan, Åstebro, and Sierra \(2016\)](#) find that the average number of investors per campaign in Seedrs, between July 2012 and September, is 71 and the median investment is 279 pounds.

interest to exclude low-quality projects from listing. On the other hand, the nominee structure used by some platforms (instead of a direct shareholder model) can be more effective to deal with moral hazard issues, because in this model the shareholder dispersion and the coordination costs are reduced, and the free rider problems among individual crowd investors are avoided. There are also some hybrid crowdfunding platforms (e.g., SyndicateRoom and AngelList) that combine a lead investor with the crowd. The lead investor (professional investor, such as a Business Angels or a Venture Capitalist), who must invest a minimum percentage of the round (e.g., 40% in SyndicateRoom), negotiate the terms of the campaign (firm valuation, funding target, etc.) and use their expertise to conduct due diligence and monitoring the investment. The crowd investors receive the same economic terms as the lead investors. These hybrid crowdfunding platforms combine the advantages of professional investors (expertise, ability, and resources to conduct due diligence and monitoring) with the “wisdom of the crowd” and could be an efficient way to reduce the information asymmetry problems, such as adverse selection and moral hazard ([Agrawal et al., 2016](#)).

However, the differences between VC/BA and ECF do not end in the way they deal with adverse selection and moral hazard problems derived from the presence of information asymmetries. They also differ in terms of geography and democratisation of entrepreneurial finance ([Agrawal, Catalini, & Goldfarb, 2015](#); [Cumming, Meoli, & Vismara, 2021](#); [Guenther, Johan, & Schweizer, 2018](#)), financial contracting ([Hornuf & Schwienbacher, 2014](#)), securities regulations ([Hornuf & Schwienbacher, 2014](#)), degree of involvement in the company management ([Di Pietro, Prencipe, & Majchrzak, 2018](#); [Garaus, Izdebski, & Lettl, 2020](#); [Wald, Holmesland, & Efrat, 2019](#)), potential exit strategies ([Hornuf & Schwienbacher, 2014](#)) and investment process ([Salomon, 2016](#)).

Many studies on VC/BA suggest that entrepreneurs and funders tend to be close geographically, as it facilitates the identification of opportunities, the assessment of entrepreneurs’ reputation and the conduction of due diligence and monitoring in post-investment (e.g. [Lerner \(1995\)](#) and [Van Nieuwerburgh and Veldkamp \(2009\)](#)). Although some studies find that ECF platforms also show a tendency for clustering in the same regions of financial centres ([Rossi & Vismara, 2018](#)), crowdfunding platforms have some characteristics that could reduce market frictions related to geographic distance ([Agrawal et](#)

[al., 2015](#); [Cumming, Meoli, et al., 2021](#); [Guenther et al., 2018](#)). According to [Agrawal et al. \(2015\)](#), there are three reasons for it. First, as projects are published online, it is easier to find new investment opportunities. Second, given the small contributions, the investment risk is reduced as well as the need for monitoring. Third, the information problems could be reduced by the (standardized) information provided by platforms about projects and funders. However, even if crowdfunding reduces the geographical constraints of investments in start-ups, it doesn't eliminate all of them. According to [Bade and Walther \(2021\)](#), the limited capacity of investors to process information, especially in ventures with larger information asymmetries (such as young ventures), and the need of allocating their scarce attention resources to selected campaigns, increases the likelihood that they will invest in local ventures. Others suggest that the sensitivity to distance on equity crowdfunding depends on the type of investors. For instance, [Guenther et al. \(2018\)](#) find empirical evidence that while overseas investors are not sensitive to distance, that is not so evident for home country investors. Moreover, local bias still exists in the pre-investment stage of platforms, since the geographic distance between the firm and the platform location affects negatively the possibility of projects being launched ([Zhang, Li, Wu, & Long, 2019](#)).

Prior literature also suggests the existence of gender and race gaps in entrepreneurial finance, showing evidence of higher constraints on access to capital for businesses owned by a woman ([Coleman & Robb, 2009](#); [Greene, Brush, Hart, & Saporito, 2001](#)) and by black persons ([Fairlie & Robb, 2007](#)). However, some argue that ECF can help the democratisation of entrepreneurial finance. For instance, [Cumming, Meoli, et al. \(2021\)](#), compare two samples of equity offerings, one sample of ECF campaigns from Crowdcube and another of IPOs from London's Alternative Investment Market (AIM), and provide some evidence that underrepresented groups of potential entrepreneurs on traditional stock markets (e.g. IPO) use ECF. They find evidence that companies with younger team members are more likely to launch equity crowdfunding offerings than IPOs and that ECF alleviates some of the distance-related economic frictions between entrepreneurs and investors. However, while they do not find evidence that female entrepreneurs have higher chances of successfully raising capital in ECF than in an IPO, the research shows a higher sensitivity to ethnicity from small investors, relative to professional investors, as minority entrepreneurs are associated with a higher number of investors. Nevertheless, empirical research about the relevance of gender on ECF is not consensual. While some suggest a limited impact of

women-owned start-ups in the democratising access to capital access in ECF ([Andrieu, Le Pendeven, & Leboeuf, 2021](#); [Geiger & Oranburg, 2018](#); [Malaga, Mamonov, & Rosenblum, 2018](#)), others suggest that gender gap may be reversed in the context of crowdfunding ([Johnson, Stevenson, & Letwin, 2018](#)), even if women's advantage could be weaker in later development stages of ventures ([Zhao, Xie, & Yang, 2021](#)).

While traditionally the financing contracts are broadly negotiated between the entrepreneur and the investors in VC/BA or are informal contracts, in the case of Family and Friends (F&F) investors, ECF investments are made through an internet platform using standardized financial contracts ([Hornuf & Schwienbacher, 2014](#)). Furthermore, as crowdfunding investors are uncredited and unable to negotiate financial contracts, the security laws and regulators tend to implement mechanisms to protect them. In traditional capital markets, small investors are protected through information requirements of the companies (e.g., IPO prospectus and the obligation of providing financial and other information periodically). However, such requirements are not adequate in the ECF market, because the inherent costs would be disproportionately high (given the relatively small funding targets). This way, the protection of the investors is made differently. Among other requirements imposed on Crowdfunding Platforms, the ECF regulation usually limits the investment amount of each investor (a limited fraction of investors' annual income), as well as the funding target⁹ ([Hornuf & Schwienbacher, 2014](#)).

As previously mentioned, VC/BA investors play a relevant role in start-ups, providing mentoring, and support services (such as helping in the development of the business plan, facilitating strategic partnerships, building the internal organization of the firm, and accessing other financial intermediaries), as well as on the certification of firm quality ([Denis, 2004](#); [Hellmann & Puri, 2002](#)). And some argue that small investors may benefit from the advantages of the presence of large institutional investors in selection, monitoring and management support ([Hornuf & Schwienbacher, 2018b](#)). Although one of the disadvantages pointed out to ECF is the opportunity costs of those professional investors' advantages ([Agrawal et al., 2014](#)), there is some evidence that crowd equity investors also can contribute

⁹ See, for instance, [Bradford \(2012\)](#) for a broad discussion about crowdfunding laws in the USA or [Rossi and Vismara \(2018\)](#) for a description of the evolution of Equity Crowdfunding in Italy, France, Germany and the UK.

to the performance of start-up firms by providing inputs related to product development, the definition of a business growth strategy and help with expansion into new markets, market knowledge, access to networks ties with industry players and other relevant stakeholders ([Di Pietro et al., 2018](#)), even if these benefits are not the same for all start-ups, being dependent on start-ups' and founders' characteristics. Although most crowd funders have some kind of involvement with the start-ups they invest in, the degree of such involvement is not always the same. [Garaus et al. \(2020\)](#) found that most crowd funders carry low-involvement activities (word of mouth to promote the product or the company, buying the product or service, and providing feedback), but some also engage in high-involvement activities (strategic advice - giving advice or providing feedback about the process of developing the new product). According to the authors, while the degree of involvement is positively related to the size of the investment, the high-involvement activities are linked to personal proximity and intrinsic motivation. Geographic proximity and age are only associated with low-involvement activities.

VC/BA also differ from crowd investors in terms of exit options. While venture capitalist frequently uses IPO for their disinvestments¹⁰, this exit option may not be able to crowdfunded firms given their small dimension ([Hornuf & Schwiendbacher, 2014](#)). Further, there is empirical evidence that post-offering deals, such as M&A or IPO, are very rare for crowdfunded firms. For instance, [Signori and Vismara \(2018\)](#) using a sample of firms that were successfully funded on the Crowdcube platform between 2011 and 2015 found that, at the end of April 2017, only 1.4% were targeted in M&A (any IPO).

Finally, another difference between VC/BA and ECF is related to the investment process. [Salomon \(2016\)](#) identifies that the investment process of crowdfunding portals and VC are similar, but they differ in two respects: in the timing of fundraising and, in the selection/evaluation phase. As VC firms invest on behalf of institutional investors, the first step of the investment process is the fundraising of the VC fund and only then begins the selection of the projects. In equity crowdfunding, the process is somewhat inverted, as the fundraising takes place only after the selection of projects by the crowd. As for the

¹⁰ For instance, according to the report "Investing in Europe: Private Equity activity 2020" by Invest Europe, the association that represents Europe's private equity and venture capital industry, the exit routes more often (in % of total amount) used by Venture Capital in divestments are trade sale, write-off, and public offering (IPO). Report available at <https://www.investeurope.eu/research/activity-data/>.

selection/evaluation phase, while the VC assume all the responsibility for their investment decisions, in equity crowdfunding this phase is divided into two stages: (i) the pre-selection carried out by the platform team and (ii) the crowd evaluation and selection. The author also points out that due diligence carried out by crowdfunding platforms is lighter and less complete than VC's due diligence. Additionally, using a case study of an equity crowdfunding platform in Switzerland, that combines traditional practices of VC with equity crowdfunding, he suggests that this combined model may be beneficial to both players (VC and ECF). While the VC benefit from the “social proof”, reducing the uncertainty associated with start-ups, the ECF benefit from the expertise of the VC in conducting deep due diligence, monitoring, and participation on the start-ups' board.

In **Table 2** we summarise the main differences between ECF, and VC/BA discussed in this section, pointing out some empirical references in the literature about it. Then, in **Table 3** we summarise the main findings of ECF literature that compares ECF with traditional sources of entrepreneurial funding.

Table 2 - Main differences between ECF and VC/BA

Characteristics	Some empirical evidence/references in the literature
Number of investors	Successful projects in Seedrs, between 2012 to 2015, attracted an average of 158 investors (Vulkan et al., 2016). Usually, in VC/BA there is only one investor (or a limited number of investors in syndicated investments).
The average amount of investment	The median funding amount of each crowd investor in Seedrs, between 2012 to 2015, was 279 pounds (Vulkan et al., 2016).
Funding amount	The average sum invested is substantially higher for BA than for crowdfunders (Miller, Scahill, & Warren, 2019). For instance, Vulkan et al. (2016) report that the median campaign goal of successful projects in Seedrs, between 2012 to 2015, was 78.520 GDP. According to the Annual report of Invest Europe, in 2020 ¹¹ , in venture capital, the average investment per company was around 2,4 million EUR (12 billion EUR in 5.005 companies).
Type of investors	Only a (small) fraction of investors in ECF are classified as sophisticated (Vismara, 2018). Thus, most crowd investors don't have the same experience and abilities as VCs to evaluate business plans and select the best start-ups (Ahlers et al., 2015).
The democratisation of start-up finance	Prior literature suggests the existence of gender and race gaps in entrepreneurial finance, showing evidence of higher constraints on access to capital for businesses owned by a woman (Coleman & Robb, 2009; Greene et al., 2001) and black persons (Fairlie & Robb, 2007). Even if the empirical research about the relevance of gender on ECF is not consensual, there is some evidence that companies with younger team members are more likely to launch ECF campaigns and that minority entrepreneurs are associated with a higher number of investors (Cumming, Meoli, et al., 2021).

¹¹ “Investing in Europe: Private Equity activity 2020”, report available at <https://www.investeurope.eu/research/activity-data/> <https://www.investeurope.eu/research/activity-data/annual-activity-statistics/>.

Characteristics	Some empirical evidence/references in the literature
Mechanisms to deal with adverse selection and moral hazard issues	While VC/BA use pre-investment due diligence to deal with adverse selection problems and actively monitor the firms' managers in post-investment to reduce moral hazard issues (Van Osnabrugge, 2000), the crowd investors rely on the wisdom of the crowd (Surowiecki, 2004 ; Walthoff-Borm, Vanacker, et al., 2018).
Geography	Crowdfunding platforms have some characteristics that can reduce market frictions related to geographic distance (Agrawal et al., 2015), even though the effect is higher for overseas investors than for country investors (Guenther et al., 2018).
Contracts	While traditionally the financing contracts are broadly negotiated between the entrepreneur and the VC/BA investors or are informal (as for F&F investors), the ECF investments are made through an internet platform using standardized financial contracts (Hornuf & Schwienbacher, 2014).
Management support	VC/BA play a relevant role in start-ups, providing mentoring, support services and certification of firm quality (Denis, 2004 ; Hellmann & Puri, 2002). While most crowd funders only carry low-involvement activities (word of mouth to promote the product or the company, using the product or service, and providing feedback), some also engage in high-involvement activities (strategic advice) (Garaus et al., 2020) and can contribute to the performance of start-up firms by providing valuable inputs (Di Pietro et al., 2018).
Exit options	The exit routes more often used in the private equity and venture capital industry are trade sale, IPO and sale to another private equity fund. However, some of these exit options may not be available to crowdfunded firms given their small size (Hornuf & Schwienbacher, 2014) and empirical evidence reveals that post-offering deals, such as M&A or IPO, are rare for crowdfunded firms (Signori & Vismara, 2018).
Investment process	The investment process of crowdfunding portals and VC have some similarities, but they differ in the timing of fundraising and, in the selection/evaluation phase. In ECF, fundraising occurs only after the crowd evaluations of the project and the selection/evaluation phase is divided into two stages: (i) the pre-selection carried out by the platform team and (ii) the crowd evaluation and selection (Salomon, 2016).

Table 3 - Summary of main findings of literature about comparison of ECF with other sources of start-up financing

Paper	Research Design	Data (sample)	Main results/conclusions
Agrawal et al. (2014)	Conceptual	-	Incentives and disincentives for entrepreneurs, platforms and investors that participate in ECF. Potential sources of market failure in ECF (adverse selection, moral hazard, collective action) and market design features that may reduce it (reputation signalling, platform rules and industry regulation, crowd due diligence and provision point mechanism).
Hornuf and Schwienbacher (2014)	Conceptual	-	Differences and similarities between ECF and BA. Like BA, crowdfunders buy shares of a company, but they differ in terms of financial contracting, securities regulations, degree of involvement in firm management, degree of financial asymmetries and potential exit strategies. More than BA/VC substitutes, crowdinvestors complement professional investors because they fill the gap or co-invest with them.
Agrawal et al. (2015)	Empirical (quantitative)	34 Projects (artists) funded in Sellaband (Netherlands)	Crowdfunding reduces but does not eliminate, the geographical constraints of investments in start-ups. It maintains social frictions as information continues to be held more likely by individuals socially connected.
Salomon (2016)	Empirical (qualitative)	11 interviews with market participants and 1 case study (Investee - Swiss platform)	The investment process of crowdfunding portals and VC are similar, but they differ in the timing of fundraising and, in the selection/evaluation phase. In ECF, fundraising occurs only after the crowd evaluation of the project and the selection/evaluation phase is divided into two stages: (i) the pre-selection carried out by the platform team and (ii) the crowd evaluation and selection.
Geiger and Oranburg (2018)	Empirical (qualitative)	243 ECF campaigns (USA)	ECF does not democratise access to capital concerning gender. Provide empirical evidence that campaigns with a female primary signatory receive significantly less funding, and this effect is amplified for larger campaigns.
Guenther et al. (2018)	Empirical (quantitative)	104 crowdfunding projects from ASSOBS (Australia)	While ECF does not eliminate distance-related economic frictions within the home country investors (for both retail and accredited investors), overseas investors are not sensitive to distance.
Malaga et al. (2018)	Empirical (quantitative)	6,234 Title II ECF offerings from 17 platforms (USA)	ECF has limited impact on democratising access to capital for women-owned firms, which continue to be under-represented in Title II ECF platforms in the USA. The target of the campaigns launched by women-owned firms is also lower than that of male-led companies. However, in many industries, companies led by women have the same success rates, if not higher, than those led by men. Thus, the evidence of the underrepresentation of firms led by women can be explained by self-selection rather than the existence of a bias against women in the US Title II ECF platforms.

Paper	Research Design	Data (sample)	Main results/conclusions
Miller et al. (2019)	Empirical (quantitative)	74 (of 171) noncorporate shareholders of a firm (New Zealand)	For both crowdfunders and BA, philanthropy is the main investment motivation, even though this is more pronounced in the crowdfunders group. BAs have a higher proportion of rationally based compared to emotionally based investment decisions, for crowdfunders emotionally based investment decisions are more frequent. In any case, crowdfunders put fewer funds at risk, as the average sum invested is substantially lower than for BA investors.
Cummings et al. (2020)	Empirical (qualitative)	540 comments were submitted as part of a public consultation on the US equity crowdfunding regulations (the USA, 2013-2015)	Explores how the spread of ECF (that combines characteristics of both public and private equity financing) may affect entrepreneurial finance research and practice. From a framework of two primary dimensions ("Actors" involved in equity crowdfunding: issuers, investors, and intermediaries and "Perspective" with which the actor was considered - expectations, interests, and concerns related to equity crowdfunding from the perspective relational, behavioural, or technical), the authors derive and present a set of unanswered questions and research directions about ECF.
Garaus et al. (2020)	Empirical (quantitative)	151 investors from Seedmatch (Germany) 254 investors from Conda (a German-speaking country)	Most crowdfunders get involved with the start-ups they invest in. Although most are low-involvement activities (word of mouth to promote the product or the company, using the product or service, and providing feedback), some of the investors also engage in high-involvement activities (strategic advice). The degree of involvement is positively related to the size of the investment. High-involvement activities are linked to personal proximity and intrinsic motivation, while geographic proximity and age are only associated with low-involvement activities.
Cumming, Meoli, et al. (2021)	Empirical (quantitative)	167 ECF firms on Crowdcube (UK) and 99 offerings on London's AIM	ECF democratizes entrepreneurial finance by providing access to funding to underrepresented groups of potential entrepreneurs on traditional stock markets (IPO). Companies with younger team members are more likely to launch equity crowdfunding offerings than IPO and ECF alleviate some of the distance-related economic frictions between entrepreneurs and investors. However, they do not find evidence that female entrepreneurs have higher chances of successfully raising capital in ECF than in an IPO.

2.3. Why and when do entrepreneurs prefer ECF?

In the previous chapter, we explored the differences between ECF and traditional funding sources for start-ups. Now we will address the question of why and when entrepreneurs prefer ECF.

Listing on an ECF platform can be part of a start-up's marketing strategy ([Estrin, Gozman, & Khavul, 2018](#)), as it enhances the project's and firm's media exposure ([Brown, Mawson, Rowe, & Mason, 2018](#)). Moreover, the interaction with new shareholders and end-user engagement provide useful market information about the demand for products and inputs for product development ([Agrawal et al., 2014](#); [Blaseg, Cumming, & Koetter, 2021](#); [Di Pietro, 2021](#); [Di Pietro et al., 2018](#); [Estrin et al., 2018](#); [Garaus et al., 2020](#)), as well as access to networks ties with industry players ([Brown et al., 2018](#); [Di Pietro et al., 2018](#)). However, some of those benefits could not be the same for all start-ups and it depends on start-ups' and founders' characteristics ([Di Pietro et al., 2018](#); [Troise & Tani, 2021](#)). This way, there is empirical evidence that innovative, consumer-focused, early-stage firms are those that reveal a stronger demand for this source of funding ([Brown et al., 2018](#)).

ECF also permits retaining strategic control, minimising the equity dilution and maintaining high levels of autonomy ([Brown et al., 2018](#); [Di Pietro, 2021](#)), getting funding at a lower cost ([Agrawal et al., 2014](#)) and more quickly ([Brown et al., 2018](#); [Di Pietro, 2021](#)). Moreover, a successful ECF campaign allows firms to gain credibility and reduce information asymmetries, facilitating future funding rounds from professional investors ([Brown et al., 2018](#); [Wald et al., 2019](#)).

However, ECF also has potential costs related to early disclosure of entrepreneurial activities ([Agrawal et al., 2014](#); [Blaseg et al., 2021](#)), opportunity costs of professional investors' advantages ([Agrawal et al., 2014](#)), and costs of communication with a large investor community and equity dilution that can discourage future professional investors ([Agrawal et al., 2014](#); [Blaseg et al., 2021](#)).

[Hornuf and Schvienbacher \(2014\)](#) suggest that entrepreneurs in ECF face the double trust dilemma of innovation, as they must disclose the innovations through the crowd (to signal

the quality of projects), but doing so if the innovation is replicable, its market value can be reduced or lost.

Furthermore, as stated before, VC/BA are not just funders, they also provide mentoring and strategic advice ([Denis, 2004](#); [Lerner, 1995](#)), promote networks with potential clients, suppliers of goods and other specialized services ([Hsu, 2006](#)), support the process of hiring professional managers ([Hellmann & Puri, 2002](#)) and certify the quality of start-ups ([Hsu, 2004](#)). Thus, by opting for ECF instead of VC/BA, the entrepreneurs will not be able to obtain such benefits. Even so, some argue that more than BA/VC substitutes, crowd investors complement professional investors because they fill the gap or co-invest with them ([Hornuf & Schwienbacher, 2014](#); [Wang, Mahmood, Sismeiro, & Vulkan, 2019](#)). There is some empirical evidence that angel and crowd investors interact on ECF platforms, and angel investors help to reduce information asymmetries by providing valuable information to the crowd (high-contribution pledges in general and on angles pledges serve as an effective signal of venture quality because they are costly and difficult to imitate). While angels are important for financing large ventures, the crowd investors not only complement angels in large campaigns, but also play a key role in the funding of small ventures (that might be less interesting to angels). So, this evidence suggests that ECF facilitates both small and large ventures to access capital, previously unobserved in traditional sources of funding ([Wang et al., 2019](#)).

So, given the advantages and disadvantages associated with ECF, why and when do entrepreneurs prefer to get funding through ECF campaigns rather than VC/BA investors?

[Troise and Tani \(2021\)](#) suggest that both entrepreneurial characteristics, alertness, and self-efficacy, influence the motivations of entrepreneurs to adopt ECF (e.g., acquiring new market/strategy knowledge, co-creating products, promoting their products, or exploiting the crowd network), which in turn have an impact on their behaviour in terms of campaign characteristics (campaign communication strategy and offerings characteristics), that can influence ECF campaign performance. Entrepreneurial Alertness allows entrepreneurs to identify new opportunities and leverage the crowd to get access to more networks but also to engage the crowd in promoting their business. Entrepreneurial Self Efficacy, however,

reduces the perceived need for external inputs for their products (or markets) and their networking capabilities.

Using convergent interviews with venture capitalists, [Ley and Weaven \(2011\)](#) suggest that equity crowdfunding is not appropriate to fund start-ups that have complex due diligence requirements, high information sensitivity (information that cannot be disclosed to the crowd) or long economic life, requiring follow-on funding.

Others propose and find empirical evidence that firms use equity crowdfunding as a last resort ([Walthoff-Borm, Schvienbacher, & Vanacker, 2018](#)). Following Pecking Order Theory ([Myers & Majluf, 1984](#)), the authors find empirical evidence that firms with lower internal funds (most of them unprofitable) and limited debt capacity (excessive debt levels and high level of intangible assets) are more likely to search for ECF. They also document that the failure rate of crowdfunded firms is relatively higher than for the matched samples of non-ECF firms (13% and 6% in each group, respectively) and that the firms with unsuccessful ECF campaigns have significantly higher failure rates (43%) than successful ones (15%), which provides additional evidence that firms use equity crowdfunding as last resort.

The hypothesis that the riskiest firms, with fewer financing alternatives, are those that most seek ECF was also tested by [Blaseg et al. \(2021\)](#). Using a sample of 163 crowdfunded firms on the largest ECF platforms in Germany (Companisto, Fundsters, Innvestment, and Seedmatch) and 163 firms that did not use ECF but could have, they find evidence that start-ups are more likely to seek ECF when they relate to troubled banks and when they do not have access to other sources of equity financing. In their sample, start-ups that use ECF are more likely to fail.

However, others suggest that ECF campaigns are part of the company's funding strategy, arguing that entrepreneurs prefer ECF over other forms of entrepreneurial funding to minimise equity dilution and retain the maximum level of autonomy ([Brown et al., 2018](#)).

These somewhat contradictory results are reconciled by [Stevenson, McMahon, Letwin, and Ciuchta \(2021\)](#) who propose the existence of two types of entrepreneurs in ECF: necessity

fund-seekers and strategic fund-seekers. Using a case studies of 14 firms that had completed a funding round in the USA and interviews with entrepreneurs and funders, they found that contrary to necessity fund-seekers, strategic fund-seekers prefer ECF instead of other sources of funding for several reasons, such as to avoid losing power and strategic control in the company (transactional value), higher efficiency (not overly time-consuming); to capture value from funders (demand-side complementary value, e.g. mass referrals, prospective customer lists); to create value from the fundraising process itself (market validation information) and external stakeholder values.

From a different perspective, other authors investigate and develop theoretical models about the choice between reward and equity crowdfunding. In the presence of asymmetric information, these models predict that entrepreneurs prefer the reward model when the initial capital requirements are small ([Belleflamme et al., 2014](#)) and the projects are of high quality ([Miglo & Miglo, 2019](#)). However, if the entrepreneurs are overconfident, then ECF is preferable because entrepreneurs may obtain relevant information from the sale of shares before making production decisions ([Miglo, 2021](#)). However, there is a lack of empirical evidence to confirm the predictions of these models.

In *Table 4* we present a summary of the key findings of ECF literature about why and when entrepreneurs prefer ECF over traditional sources of entrepreneurship funding.

Table 4 - Summary of main findings of why and when entrepreneurs seek funding on ECF platforms

Paper	Research Design	Data (sample)	Main results/conclusions
Ley and Weaven (2011)	Conceptual	11 interviews with venture capitalists	Equity crowdfunding is not appropriate to fund start-ups that have complex due diligence requirements, high information sensitivity (information that cannot be disclosed to the crowd) or long economic life and require follow-on funding.
Belleflamme et al. (2014)	Theoretical model	-	Theoretical model about the entrepreneur's choice between reward and equity crowdfunding models. Assuming that "community benefits" increase the utility of investors, the model shows that entrepreneurs prefer the reward model when the initial capital requirements are small compared to the market size, and ECF otherwise.
Brown et al. (2018)	Empirical (qualitative)	Entrepreneurs of 42 ECF start-ups on Crowdcube, Seedrs and SyndicateRoom (UK)	Find evidence that innovative, consumer-focused, early-stage firms reveal a strong demand for ECF. However, the perceived lack of financial alternatives and the ability to get finance quickly are crucial factors for entrepreneurs seeking ECF. Consistent with the pecking order theory, entrepreneurs also prefer equity crowdfunding to minimise equity dilution and retain maximum levels of autonomy. More than money, the ECF delivers important intangible benefits to entrepreneurs, such as media exposure, interaction with new shareholders and end-user engagement and feedback. It can also facilitate future rounds of funding.
Estrin et al. (2018)	Empirical (qualitative)	64 structured interviews with entrepreneurs and experienced investors in the UK	The ECF market has grown significantly in recent years and qualitative data suggests that this new form of entrepreneurial finance is incremental to the traditional ones (VC/BA), attracting many new investors. In addition to raising funds, ECF is part of the marketing strategy for entrepreneurs. While some investors are somewhat optimistic about ECF returns, most of them clearly understand and properly assess the risk that they are bearing.
Walthoff-Born, Schwienbacher, et al. (2018)	Empirical (quantitative)	277 ECF firms on Crowdcube (UK) and 2 matched samples	Consistent with the pecking order theory, firms search for equity crowdfunding platforms as a "last resort": when they do not have internal funds and have limited debt capacity.
Miglo and Miglo (2019)	Theoretical model	-	Theoretical model on the entrepreneur's choice between different types of crowdfunding. The model predicts that when asymmetric information is important, high-quality projects prefer reward-based crowdfunding.
Wald et al. (2019)	Empirical (qualitative)	26 interviews were performed with market participants in ECF (Israel and Norway)	In addition to financing, ECF investors provide two categories of benefits: inward benefits and outward benefits. Inward benefits include investors' contributions of personal experience and expertise (support for firm management, practical knowledge and expertise, future finance, and strategic functions). The outward benefits are related to public exposure and the recruitment of additional investors (including public relations, media exposure and social connections).
Wang et al. (2019)	Empirical (quantitative)	50,999 investors and 1151 campaigns from	Angels and crowd are complementary investors, which has a positive effect on the overall efficiency of the ECF market. There is evidence that angel and crowd investors interact on ECF platforms, and angel investors help to reduce information asymmetries by providing valuable information to the crowd. While angels are important for

Paper	Research Design	Data (sample)	Main results/conclusions
		one of the UK's leading ECF platforms	financing large ventures, the crowd investors not only complement angels in large campaigns, but also play a key role in the funding of small ventures (less interesting to angels).
Blaseg et al. (2021)	Empirical (quantitative)	163 ECF firms from Companisto, Fundsters, Innovestment, Seedmatch (Germany) and 163 non-ECF firms	ECF offers entrepreneurs a way to access many investors and get market feedback. However, potential costs also arise from early disclosure of entrepreneurial activities, costs of communication with a large investor community and capital dilution that can discourage future equity investors. Finds evidence that start-ups are more likely to seek ECF when they relate to troubled banks and less likely when they have access to other sources of equity funding and are associated with less risky banks (well capitalized and liquid). According to Pecking Order Theory, lower-quality start-ups are more likely to seek ECF.
Di Pietro (2021)	Empirical (qualitative)	38 interviews with entrepreneurs who successfully fundraised on Crowdcube and Seedrs (UK)	In addition to raising finance in a short time, entrepreneurs benefit from the validation of market potential, create a large customer community before commercialization, increase professional investment readiness (gain credibility and reduce information asymmetries) and maintenance of strategic control (minimize dilution of their equity stake and retain the maximum level of autonomy).
Miglo (2021)	Theoretical model	-	Theoretical model on the entrepreneur's choice about crowdfunding model, using a behavioural finance approach. In the presence of asymmetric information and overconfident entrepreneurs, the model predicts that ECF is preferable to reward-based crowdfunding because entrepreneurs may obtain relevant information from the sale of shares before making production decisions. In contrast to Pecking Order Theory, the model predicts an equilibrium where some firms use ECF.
Troise and Tani (2021)	Empirical (quantitative)	Survey of 97 firms with ECF campaigns in 12 ECF (Italy; campaigns ended before September 2019)	Both entrepreneurial characteristics, alertness, and self-efficacy influence the motivations of entrepreneurs to adopt ECF, which in turn have an impact on their behaviour in terms of campaign communication and offerings characteristics, which can influence ECF campaign performance.
Stevenson et al. (2021)	Empirical (qualitative)	Case studies of 14 ECF firms on the leading portal in the USA and 16 interviews with entrepreneurs and funders (USA)	There are two types of entrepreneurs in ECF: necessity fund-seekers and strategic fund-seekers. There are several factors why strategic fund-seekers prefer ECF, such as transactional value (avoid losing power and strategic control in the company); efficiency (not overly time-consuming); value capture from funders (demand-side complementary value, e.g., mass referrals, prospective customer lists); value creation from the fundraising process itself (market validation information) and external stakeholder values.

2.4. ECF platforms models

Platforms play a crucial role in ECF as they act as intermediaries between projects/firms and potential investors. Their activity is usually regulated by specific laws in each country¹². The literature about the role of platforms in ECF can be divided into two groups. The first one is mainly descriptive and focuses on the differences between platforms models, in terms of the business model (fee structures, due diligence procedures, industry focus) ([Cumming, Johan, & Zhang, 2019](#)), mechanism of shares allocation (first come, first serve or auction mechanism) ([Hornuf & Schwienbacher, 2018b](#)), funding process ([Löher, 2017](#); [Salomon, 2016](#)) and crowd designs ([Aggarwal, Lee, Osting, & Singh, 2021](#); [Chen, Huang, & Liu, 2016](#)). The second group investigate how the differences across equity crowdfunding platforms influence the success of equity crowdfunding campaigns and post-campaign firm outcomes ([Cumming, Johan, et al., 2019](#); [Rossi & Vismara, 2018](#); [Rossi et al., 2019](#)).

Platforms are profitmaking entities and their revenues come from the fees charged to firms and, in some cases, to investors. In many cases, the fees are only charged if the crowdfunding campaign is successful, i.e., if the target amount is reached ([Cumming, Johan, et al., 2019](#)). As their performance and survival depend on the growth of the crowdfunding industry and their ability to attract high-quality projects, platforms benefit from the application of due diligence procedures to reduce the likelihood of promoting on their websites fraudulent or lower-quality projects ([Cumming, Vanacker, et al., 2021](#)). Thus, before launching the campaigns online on their websites, the platforms' team makes a pre-selection of investment proposals ([Cumming, Johan, et al., 2019](#); [Salomon, 2016, 2018](#)).

Beyond the crowdfunding model (donation, reward, equity and/or lending), according to [Cumming, Johan, et al. \(2019\)](#) the platforms make three main strategic choices: (i) fee structures (fixed or variable – frequently, the platform only receives a fee from successfully funded projects), (ii) due diligence procedures (even considering that almost all crowdfunding regulations require that platform do due diligence, they can decide to do a

¹² For a review of regulations in equity crowdfunding see, for instance, [Hornuf and Schwienbacher \(2017\)](#) and [Rossi, Vismara, and Meoli \(2019\)](#).

more or less extensive one) and (iii) industry focus (while some platforms are generalists, others focus on a specific industry).

[Cumming, Vanacker, et al. \(2021\)](#) suggest that the unique characteristics of ECF imply that many governance mechanisms traditionally used in public and private firms may not be effective in this context. Contrary to public firms, crowdfunded firms neither are not actively monitored or evaluated by stock analysts, nor are subject to capital market discipline (given the inexistence of a liquid secondary market the exit options are reduced ([Signori & Vismara, 2018](#)). In contrast to private firms, the crowd investors don't have the abilities and resources of professional investors (VC/BA) to conduct detailed due diligence, negotiate and write a (complete) contract or monitor the firms after the investment. This way, [Cumming, Vanacker, et al. \(2021\)](#) propose a set of specific governance mechanisms for ECF, which may be an effective way of reducing the costs associated with the informational asymmetry problems (adverse selection and moral hazard). Those mechanisms are related to all players in the ECF market, including investors (the wisdom of the crowd), entrepreneurs (signalling the unobservable quality of the firm¹³), platforms (due diligence¹⁴, shareholder structures, secondary market) and country institutions (formal institutions – e.g. investor protection laws - and informal institutions – e.g. higher country-level trust ([La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997](#))).

Platforms also use different mechanisms of share allocation to investors in ECF, such as (i) the first-come, first-served mechanism (the most usual) or (ii) the auction mechanism. Empirical evidence suggests that the choice of the market mechanism affects the dynamics of investor behaviour during the campaign. While an auction mechanism induces late investments (as in this mechanism prices change during the campaign, the investors have an incentive to postpone their investment decisions to the last days of the campaign, avoiding a price increase due to higher demand); the first-come, first-served mechanism induces quick investments during the first days (on this mechanism, the prices remain constant during the

¹³ For instance, some credible signals that entrepreneurs may send to investors about the firm quality are equity retention (empirically confirmed, for instance, by [Vismara \(2016\)](#)) or setting a formal board of directors. However, other signals sent by entrepreneurs are not verifiable, the called “cheap-talk” (ex. intention to conduct an IPO in future), may exacerbate the adverse selection problems.

¹⁴ Given the reputational concerns of platforms, that can determine their future survival and performance, they are interested in performing due diligence (even if they were not required by law) to identify, and exclude from their websites, potential fraud projects or firms without a minimum level of quality.

campaign and investors prefer to bid in early days to guarantee the investments) ([Hornuf & Schwienbacher, 2018b](#)).

The ECF platform models can be classified according to the crowd design: pure crowds or hybrid crowds ([Chen et al., 2016](#)). While in pure crowds, the crowd members participate as equal investors, in hybrid models the crowd members are led by an expert investor. Based on the observation of industry practices, [Chen et al. \(2016\)](#) argue that pure crowds have several shortcomings, in terms of providing due diligence, social influence, home bias and high management costs associated with a lack of a single voice, suggesting that hybrid crowds can overcome those inefficiencies, particularly, in the presence of high-risk projects, with high information asymmetry and a high cost of crowd management.

Similarly, [Agrawal et al. \(2016\)](#) argue that the syndicate structure of ECF, involving a lead investor (with an incentive system for lead investors to conduct due diligence and monitor progress on behalf of other investors) reduces market failures caused by information asymmetries and allow a more efficient allocation of capital, boosting economic growth. Moreover, to surplus the potential agency problems between lead investors and the crowd, the authors propose the use of compensation and reputation mechanisms to lead investors.

Given the greater efficiency of the hybrid model over the pure crowd, [Aggarwal et al. \(2021\)](#) develop a measure of the quality of lead investors that can be useful for platforms to identify investors who are good candidates to lead financing rounds.

Another line of research in the context of platforms is related to the funding process, particularly on the relevance of the pre-selection process of platforms ([Kleinert, Bafera, Urbig, & Volkmann, 2021](#); [Löher, 2017](#)).

There is some evidence that this pre-selection phase can be even more critical to the campaign's success than the online campaign phase. For instance, [Kleinert et al. \(2021\)](#) find that 90% of start-ups are rejected in the pre-campaign phase.

[Löher \(2017\)](#) investigate the pre-selection process of German equity crowdfunding platforms, using interviews with platform operators, managers of crowdfunded start-ups and

external experts. The author found that the pre-selection process in German ECF platforms is similar to the practices of VC/BA, and it includes four steps: sourcing deals; assessment of investment deals; deal structuring and campaign preparation. During the first step, the platforms receive proposals for investment deals. While there is some direct contact from entrepreneurs, they rely mainly on platforms' networks and their active search. The second step is the assessment of investment deals, including pitch screening and evaluation. The authors state that more than half of the deals are rejected in the screening phase, during which the platforms' assessment is focused on the business model, product characteristics and financial considerations. The deals that pass the first screening, go to a deeper evaluation phase, including a due diligence/plausibility check, where the characteristics of the entrepreneurs and teams are more relevant. Then, the selected deals go to the step of deal structuring (definition of investment conditions, such as firm valuation, funding amount, platforms' commission) and contracting. The last step includes the activities of campaign preparation, helping entrepreneurs to prepare the communication of campaigns to reduce the information asymmetries between the venture and potential investors.

However, what signals are used by platforms to assess the proposal quality and select the projects that go to the online platform? This question was investigated by [Kleinert et al. \(2021\)](#) and by [Zhang et al. \(2019\)](#).

[Kleinert et al. \(2021\)](#), using a conjoint experiment involving 78 decision-makers from 50 platforms in 22 countries, suggest that the most important signal of start-up quality for ECF platforms is the team experience, followed by sales agreements and, with greater distance, patents, and venture capital backing. However, the relevance of venture quality signals varies according to the business characteristics of ECF platforms (in terms of long-term, performance-oriented fee structures and co-investment requirements), the firm's industry (research-oriented or retail-oriented industries), and across countries (due to regulatory or cultural differences). On the one hand, in platforms that use the co-investment model, the acceptance rate of the venture is more positively influenced by the existence of patents and sales agreements. On the other hand, when the ECF platform prioritizes long-term performance (based on its platform's fee structure), the influence of both team experience and venture capital backing is more substantial. Moreover, sales agreements are more

relevant to retail-oriented industries and in countries where human capital and venture capital are more easily accessible the related signals become less influential.

[Zhang et al. \(2019\)](#) use a sample of 473 investment proposals from a Chinese platform (Dahuotou), 72 of them (15%) were launched online by the platforms (the other 401 projects were rejected) and find that local bias still exists in the pre-investment stage platforms, since the geographic distance between the locations of projects and a platform negatively affects the possibility of being launched. Moreover, engaging in strategic emerging industries, signals of media usage (e.g., videos) and start-ups' quality (credit) are also positively correlated with the launching of projects on the platform.

Despite the relevance of platforms for the crowdfunding industry, empirical evidence on how the differences across equity crowdfunding platforms influence the success of equity crowdfunding campaigns and post-campaign firm outcomes is still scarce ([Cumming, Johan, et al., 2019](#)). There are, however, some exceptions, which we discuss below.

[Belleflamme et al. \(2013\)](#) argue that non-profit organizations attract more money for initiatives that are of interest to the general community due to their reduced focus on profits. The authors develop a theoretical model and find empirical evidence that, in the context of individual crowdfunding practices (in which entrepreneurs do not make use of a 'structured' crowdfunding platform), non-profit organizations raise larger amounts and thereby are more successful in obtaining their targeted funds than other forms of for-profit entrepreneurs.

[Cumming, Johan, et al. \(2019\)](#), using a sample of Canadian crowdfunding portals (of all crowdfunding models) investigate the relevance of due diligence (which includes (background checks, site visits, credit checks, cross-checks, monitoring accounts, and third-party proof) for the success of crowdfunding campaigns. They find a significant positive effect of due diligence on the total amount of capital raised and the percentage of fully funded projects on the platform. They also argue that due diligence helps to identify lower quality or fraudulent projects and contributes to the reduction of information asymmetries between entrepreneurs and investors, suggesting that due diligence is relevant for platform reputation and to increase its performance.

[Rossi and Vismara \(2018\)](#) focus their research on services provided by the platform (pre-launch, ongoing campaign, and post-campaign). Using a sample of 127 investment-based crowdfunding portals in four European countries (France, Germany, Italy, and the UK), they suggest that a higher number of post-campaign services offered by the platforms increase the annual number of successful campaigns, even though pre-launch and ongoing campaign services do not have a significant impact.

[Hornuf and Schvienbacher \(2018a\)](#), using hand-collected data on the complete set (181) of successful and unsuccessful crowd investing campaigns run in Germany between 2011 and 2014, found that platform design and the structure of contracts affect crowd participation. The chances of achieving successful campaigns (raising a larger amount and higher crowd participation) increase when the minimum ticket is small, the crowd is pooled in a financial vehicle and the investments are offered in the form of profit-participating loans (instead of silent partnership agreements, common equity, and other financial contracts).

In the Italian context, two recent paper investigates the relevance of platforms' networks to the success of ECF campaigns. [Vrontis, Christofi, Battisti, and Graziano \(2021\)](#), using a sample of 315 campaigns (funded or not) launched on 21 ECF platforms, find that the presence of platforms on social networks (number of ECF platforms' connections, particularly on Twitter) and their intellectual capital (quality of a platform's employees and other people involved) influence positively the success rate of ECF campaigns. They find that the presence of EC platforms on social media and the quality of the platform's teams, increase their capability to attract investors' attention and stimulate their investments in the campaigns launched on the platform, enhancing the probability of EC campaign success. [Cosma, Grasso, Pattarin, and Pedrazzoli \(2021\)](#) examine 10 Italian ECF platforms to assess the role of (size and diversity) partner networks in a platform ecosystem in the success of the ECF campaign. They found that the choice of platform can be critical for the performance of the crowdfunding campaign in terms of capital raised, relative success and probability of success. A network of partners (including banks, investment funds, associations, agencies, syndicates universities, advisors, incubators, firms, and others) offer unique and strategic value propositions and define the competitive positioning of platforms. Despite that, they do not find evidence for the relevance of the size of the platform's network of partners, they find the diversity of such networks influences the probability of campaign success.

Finally, [Rossi et al. \(2019\)](#) investigate the impact of voting rights on the success of crowdfunding platforms, using a sample of 185 investment-based crowdfunding portals based in Australia, Austria, Canada, France, Germany, Italy, New Zealand, the UK, and the US. They identify three types of platforms in terms of voting rights: (i) platforms delivering individual voting rights to single investors; (ii) platforms delivering pooled voting rights to the community of crowdfunding investors (nominee structure) and (iii) platforms with the involvement of a lead accredited investors (syndicate-like platforms). They find evidence that platforms with individual voting rights are associated with less successful crowdfunding campaigns than platforms delivering pooled voting and that syndicate-like platforms register fewer offerings.

From a different perspective, [Dushnitsky, Guerini, Piva, and Rossi-Lamastra \(2016\)](#) analyse the relationship between the number of platforms created in a given country and a vector of country-specific variables. The authors find that country-level characteristics (e.g., population, entrepreneurial rates, and the presence of platforms operated by incumbent financial organizations such as large banks, cooperative banks, and angel networks) do matter for the creation of crowdfunding platforms in a specific country.

While the empirical studies about the role of platforms in the ECF market are dominant, according to our systematic literature review, there are only two papers that develop a theoretical model on this issue: one analyses the competition among ECF platforms ([Gal-Or, Gal-Or, & Penmetsa, 2019](#)) and the other develop a measure of the quality of lead investors ([Aggarwal et al., 2021](#)).

The competition model developed by [Gal-Or et al. \(2019\)](#) assumes the heterogeneity of both investors (in terms of experience and risk aversion) and start-ups (in terms of expected return and risk), and find that a segmenting equilibrium with two competing platforms can arise only when compatibility is very relevant for both investors and start-ups and such compatibility is more important than the size of the network externality considered by start-ups. In the segmenting equilibrium, each platform attracts segments of the two user groups that are more compatible with each other in terms of the risk profile, i.e., one platform matches more risky start-ups and experienced investors (usually more risk-tolerant), and the

second platform matches the less risky start-ups with more highly risk-averse investors. However, if such preference for compatibility is not sufficiently high, the equilibrium occurs when one platform dominates the entire market.

Arguing that hybrid crowds have some advantages over pure crowd models, [Aggarwal et al. \(2021\)](#) develop a Bayesian model to measure the quality of lead investors, which can be useful for platforms to identify investors who are good candidates to lead financing rounds and, this way, to improve the funding operations of ECF platforms.

In sum, these studies identify a set of characteristics of platforms that increase the success of equity crowdfunding campaigns and post-campaign firm outcomes, including the due diligence procedures ([Cumming, Johan, et al., 2019](#)), the number of post-campaign services offered by the platforms ([Rossi & Vismara, 2018](#)) and the platform model in terms of voting rights of investors ([Rossi et al., 2019](#)).

We present in **Table 5** a summary of the literature on ECF platform models.

Table 5 - Summary of main findings of literature about ECF platforms

Paper	Research Design	Data (sample)	Main results/conclusions
Belleflamme et al. (2013)	Theoretical model & Empirical (quantitative)	44 cases of individually crowdfunded ventures	Develops a theoretical model and finds empirical evidence that non-profit organizations attract larger amounts of money and are more successful in ECF campaigns than profit entrepreneurs, due to the stronger focus on social outcomes than on monetary gains. Additionally, entrepreneurial initiatives with higher community benefits and that offer a product (rather a service) tend to attract larger amounts of funds. However, social networks and firm age do not seem to enhance the amounts of funds raised and the relevance of the crowdfunding model is unclear.
Agrawal et al. (2016)	Conceptual	-	Syndicates reduce market failures (related to information asymmetry) and allocate capital more efficiently, boosting economic growth. By amplifying the impact of high-performing BA investors (who attract capital from global investors, rather than becoming dependent on a local investor community), the syndicate model increases the volume and pattern of capital flows in ECF.
Chen et al. (2016)	Conceptual	-	Compares two crowd designs in ECF: pure crowds and hybrid crowds. Identify several shortcomings of pure crowds, arguing that hybrid crowds can overcome those inefficiencies. Propose the use of compensation and reputation mechanisms to surplus the potential agency problems between lead investors and the crowd.
Dushnitsky et al. (2016)	Empirical (quantitative)	Census of over 600 crowdfunding platforms in 15 European countries	Purposes that country-level characteristics (e.g., population, entrepreneurial rates, and the presence of platforms operated by incumbent financial organizations such as large banks, cooperative banks, and angel networks) are relevant for the creation of crowdfunding platforms.
Löher (2017)	Empirical (qualitative)	21 interviews with platform operators, managers of crowdfunded start-ups and external experts in Germany	The pre-selection process in ECF is similar to usual practices in VC/BA and it is structured in four steps: sourcing deals; assessment of investment deals; deal structuring and campaign preparation.
Hornuf and Neuenkirch (2017)	Empirical (qualitative)	1450 bids made by 499 backers in 44 ECF campaigns on Innovestment (Germany, 2011-2014)	In an ECF platform with an auction mechanism, where the funders can specify the price of the investment ticket, the willingness of backers to pay for cash flow rights is significantly influenced by campaign characteristics, sophistication of the investors, funding progress, herding, and stock market volatility. However, geographic distance, learning effects, and sniping at the end of the auction do not affect the backers' willingness to pay for cash flow rights. The results suggest that portal designs and the organization of ECF campaigns can have a relevant impact on the willingness of funders to pay for cash flow rights and company shares more broadly.

Paper	Research Design	Data (sample)	Main results/conclusions
Hornuf and Schwienbacher (2018a)	Empirical (quantitative)	181 successful and unsuccessful campaigns from all ECF platforms in Germany	Platforms differentiate themselves along several dimensions, including the type of contracts offered to the crowd. Smaller investment tickets, pooled investments in a financial vehicle, and the use of profit-participating loans (as opposed to silent partnership agreements, common equity, and other financial contracts) help to attract a larger crowd and raise more money on ECF platforms.
Hornuf and Schwienbacher (2018b)	Empirical (quantitative)	89 campaigns (of 81 start-ups) from 4 German ECF portals (Companisto, United Equity, Seedmatch and Innovestment)	ECF Platforms use mainly two mechanisms of share allocation to investors: (i) the first-come, first-served mechanism and (ii) the auction mechanism. Empirical evidence suggests that the choice of the market mechanism affects the dynamics of investor behaviour during the campaign. While an auction mechanism induces late investments; the first-come, first-served mechanism induces quick investments during the first days.
Rossi and Vismara (2018)	Empirical (quantitative)	127 investment-based crowdfunding portals based in France, Germany, Italy, and the UK	ECF platforms are concentrated in the same regions as traditional financial centres. Older platforms, with less competition in the same region and that offer a higher number of post-campaign services have a greater number of successful campaigns.
Salomon (2018)	Empirical (qualitative)	2 case studies of ECF platforms in Switzerland (c-crowd and Investiere)	Case study of two ECF platforms in Switzerland, with significantly different ways of functioning, it is found that the process of evaluating the investment proposals depends on the sociotechnical devices implemented by the platforms and it depends on "social proof" dynamics that operate within the community of platform's investors and at the start-up ecosystem.
Cumming, Johan, et al. (2019)	Empirical (quantitative)	93 Canadian crowdfunding platforms	Due diligence procedures are more likely for larger crowdfunding platforms, in equity and lending crowdfunding models, and after legislation updates. Due diligence facilitates fundraising campaign success and helps to increase the number of investors and the total amount of capital raised on a platform.
Fatehi and Wagner (2019)	Theoretical model & Empirical (quantitative)	56 campaigns on Bolstr (USA)	Proposes a revenue-sharing contract approach to crowdfunding that maximize net present value under investor participation constraints and platform charges. The proposed revenue-sharing contract outperforms equity crowdfunding, as it has higher NPV and identical bankruptcy probabilities.
Gal-Or et al. (2019)	Theoretical model	-	Competition model for platforms in a two-sided ECF market, where investors and start-ups are heterogeneous in terms of risk preferences. Under certain conditions, the model predicts a segmenting equilibrium, where each platform attracts segments of the two user groups that are more compatible with each other (the riskiness of the start-up and the risk profile of the investor). However, if the preference for compatibility is not sufficiently high, the equilibrium occurs when one platform dominates the entire market.
Rossi et al. (2019)	Empirical (quantitative)	185 ECF platforms based in Australia, Austria, Canada, France, Germany, Italy, New Zealand, the UK, and the US	Identify three types of platforms in terms of voting rights delivered to investors: individual voting rights; pooled voting rights (nominee structure) and involvement of lead accredited investors (syndicate-like platforms). Platforms with individual voting rights are associated with less successful ECF campaigns compared to other platforms while delivering pooled voting does not influence the success of the platforms. Syndicate-like platforms register fewer successful offerings.

Paper	Research Design	Data (sample)	Main results/conclusions
Zhang et al. (2019)	Empirical (quantitative)	473 investment proposal campaigns from Dahuotou (Chinese platform)	Platforms are more likely to list projects from local start-ups (suggesting that local bias still exists in the pre-investment stage) engaging in strategic emerging industries. Signals of media usage (e.g., videos) and start-ups' quality (credit) are also positively correlated with the launching of projects on platforms.
Aggarwal et al. (2021)	Theoretical model & Empirical (quantitative)	Survey of 319 investors from one of the largest crowdfunding platforms in the US	Arguing that hybrid crowds have some advantages over pure crowd models, the authors develop a measure of the quality of lead investors that can be useful for platforms to identify investors who are good candidates to lead financing rounds.
Cosma et al. (2021)	Empirical (quantitative)	233 projects (funded or not) in 10 Italian ECF platforms	The choice of platform can be critical for the performance of the ECF campaign. The diversity (not the size) of the platform's network influences positively the probability of campaign success and how much capital it raises. Partner networks (including banks, investment funds, associations, agencies, syndicates universities, advisors, incubators, firms, and others) offer unique and strategic value propositions and define the competitive positioning of the platforms.
Cumming, Vanacker, et al. (2021)	Conceptual	-	Propose a conceptual model of combined governance mechanisms that can be used in equity crowdfunding markets to reduce adverse selection and moral hazard problems. These mechanisms encompass crowd investors (wisdom of the crowd), entrepreneurs (signalling and related substantive action), platforms (due diligence, shareholder structures, secondary markets) and country institutions (formal and informal institutions).
Kleinert et al. (2021)	Empirical (quantitative)	Conjoint experiment with 624 venture evaluations by 78 decision-makers from 50 ECF platforms in 22 countries.	The rejection rate of the pre-campaign phase is around 90%. The most important signal of venture quality to ECF platforms is the team experience, followed by sales agreements and, at a greater distance, patents, and venture capital backing. However, the valuation of venture quality signals varies across countries, with the business characteristics of ECF platforms and with the industry orientation of the new venture.
Vrontis et al. (2021)	Empirical (quantitative)	315 projects (funded or not) in 21 Italian ECF platforms	The presence of platforms on social networks (number of EC platforms' connections, particularly on Twitter) and their Intellectual capital (quality of a platform's employees and other people involved) influence positively the success rate of EC campaigns.

2.5. Drivers of Fundraising success

One of the most discussed topics in ECF literature is the determinants of campaign success. Most of the empirical research on this topic is observational and it uses data about campaigns from ECF platforms. Given the inexistence of databases about start-ups that search for ECF¹⁵, the data is frequently hand-collect and consequently, most of the samples are relatively small. A few papers also use interviews with market participants (entrepreneurs and investors) to explore the reasons why they participate in ECF.

Given the high information asymmetries of start-ups and the associated adverse selection problems ([Akerlof, 1970](#)), many of the papers explore the signals of venture quality ([Spence, 1973](#)) and how they influence the ECF campaigns outcome. The explored signals are related to the characteristics of the campaigns (equity retention, third parties certification, patents, firm stage, and growth opportunities), team (entrepreneur qualifications, team size, age, previous entrepreneurial and industry experience) and social networks. Other authors focus their research on the relevance of information disclosure for ECF campaigns' success (both information provided on the initial pitch - financial projections, videos, and pictures -, as well during the campaign – comments on discussion forums and campaign updates) and non-financial motivations of investors (tax reliefs, non-monetary rewards, sustainability-oriented ventures). From a different perspective, the ECF literature also researches how the investors' characteristics and behaviours influence investment decisions. A few papers also analyse the relevance of the investment process (investment dynamics during the campaign and competition among campaigns) and country-level characteristics of the ECF campaign's success. In the next few pages, we analyse each of these issues in detail.

¹⁵ Some databases, such as Zephyr and CrunchBase, have information about firms financed by ECF but they lack data about unsuccessful campaigns. In addition, ECF platforms also publicity the successful campaigns on their websites but, once again, they do not disclose (nor provide under request) information about failed campaigns.

2.5.1. Signals of venture's quality

2.5.1.1. Campaigns characteristics

The signals of project quality usually tested in empirical research are equity retention, third-party certification, intellectual capital (patents), and firm stage and growth perspectives.

Equity retention

As predicted by the signalling theory ([Spence, 1973](#)), the entrepreneur's willingness to invest in his project is perceived as a signal of project quality ([Leland & Pyle, 1977](#)). Entrepreneurs own private information that allows them to better evaluate the project quality. So, in the presence of high-quality projects, the entrepreneur will try to keep the highest share of capital possible. As in the venture capital environment ([Busenitz, Fiet, & Moesel, 2005](#)), the previous empirical literature on equity crowdfunding finds evidence that equity retention is a key factor in the success of the campaigns ([Ahlers et al., 2015](#); [Battaglia, Busato, & Manganiello, 2021](#); [Löher, Schneck, & Werner, 2018](#); [Nitani, Riding, & He, 2019](#); [Vismara, 2016](#)).

The certification effect

Traditionally, the literature on entrepreneurship highlights the role of VC/BA investors in the certification of start-ups' quality ([Denis, 2004](#); [Hellmann & Puri, 2002](#)), given their ability to identify firms with high growth potential ([Baum & Silverman, 2004](#)) and their contribution to reducing the probability of firm failure ([Puri & Zarutskie, 2012](#)). Given the lack of capacity and resources of crowd investors to perform due diligence and monitor the firms after the funding round, they can benefit from the presence of large and sophisticated investors to reduce adverse selection and moral hazard problems. Empirical research on crowdfunding confirms that the presence of large and sophisticated investors increases the probability of success of crowdfunding campaigns ([Hornuf & Schwienbacher, 2018b](#); [Kleinert, Volkman, & Grünhagen, 2020](#); [Li et al., 2016](#); [Li, Ling, Zhang, & Wu, 2021](#); [Troise, Matricano, Sorrentino, & Canelo, 2021](#); [Vulkan et al., 2016](#))¹⁶. In this context, some authors argue that

¹⁶ Other studies assess the relevance of previous funding through crowdfunding on the investment decisions of VC but they are mainly focused on the reward model (e.g., [Kaminski, Hopp, and Tykvová \(2019\)](#) and [Roma, Petruzzelli, and Perrone \(2017\)](#)).

hybrid models of equity crowdfunding, where the crowd members are led by an expert investor, are preferable because they can overcome some of the inefficiencies of pure crowd models (lack of due diligence, social influence, home bias and high management costs associated with a lack of a single voice) ([Chen et al., 2016](#)), reduce market failures caused by information asymmetries and allow a more efficient allocation of capital ([Agrawal et al., 2016](#)) and, then, reducing agency risk ([Mamonov & Malaga, 2018, 2019](#)). Even though the presence of a large investor is a sign of the quality of the venture, contributing to the success of ECF campaigns, there is evidence that crowd investors are cautious in their decisions to provide funds to a campaign, and that they take into consideration the ability of lead investors, in terms of previous investment experience, both in traditional and crowdfunding markets, as well as in terms of management skills ([Li et al., 2021](#)).

Intellectual property (patents)

The quality of a start-up can be assessed by its ability to innovate and develop new products, and patents are used to protect the new ideas and prevent future market entrants. In the context of entrepreneurial literature, there is empirical evidence that patents are an effective signal of the innovative capabilities of firms, contributing to their survival ([Cefis & Marsili, 2005](#); [Ortiz-Villajos & Sotoca, 2018](#)), and increasing the likelihood to obtain financing from VC ([Baum & Silverman, 2004](#); [Lahr & Mina, 2016](#)) or through an IPO ([Heeley, Matusik, & Jain, 2007](#)). Some papers also analyse the effect of patents on the ECF context, but the empirical evidence is not conclusive. While [Ahlers et al. \(2015\)](#), [Mamonov and Malaga \(2018\)](#) and ([Mamonov & Malaga, 2018](#)) don't find evidence that intellectual capital (patents) influences the funding success, [Battaglia, Busato, et al. \(2021\)](#) find strong evidence that firms with intellectual property rights (patents) in ECF platforms in Italy have a higher probability of being successful in their ECF campaigns. [Ciro Troise et al. \(2021\)](#) suggest that patents have a positive, but limited, impact on investment decisions. [Vismara \(2018\)](#) distinguishes public and early investors (investors in the first five days) from late investors, and he finds that intellectual capital seems to be relevant for early and sophisticated investors, but not for late investors.

Other authors, even not focusing their analysis on intellectual property, use the variable “patents” (number of patents or a dummy variable for capturing whether a firm owns or is

filling patents) for controlling project quality. The empirical results are also mixed. Some find a significant positive effect of patents on fundraising success ([Piva & Rossi-Lamastra, 2018](#)), while in other studies, the results are not conclusive since the variable patent isn't statistically significant in many models specifications, and in some cases are even negative ([Guenther et al., 2018](#); [Hornuf & Schwienbacher, 2018b](#); [Kleinert et al., 2020](#)).

Firm stage and growth opportunities

Considering that crowd investors, like professional VC investors, take into consideration the three types of risks of new firms: market risk (product maturity), execution risk (size and experience of the entrepreneurial team), and agency risk (involvement of professional investors) ([Mamonov & Malaga, 2018, 2019](#)), some authors argue that the firm's stage and the growth opportunities are relevant factors for the success of ECF campaigns. In this way, there is some empirical evidence that the likelihood of an ECF campaign's success is higher for firms that have completed the development of products or services and with a large number of corporate clients ([Mamonov & Malaga, 2018](#)), for larger and more profitable firms ([Smirnova, Platt, Lei, & Sanacory, 2021](#)) and projects with higher growth opportunities ([Nitani et al., 2019](#)).

2.5.1.2. Human capital

The relevance of the management team to firm performance is widely recognized ([Eisenhardt, 2013](#)), given that the management team is who defines the firm's strategy, hires employees, and decides investments, i.e., they have the power over the critical factors for the growth and success of firms. This way, many studies show that the background of top management is regarded as an important signal of a start-up's future potential and it is a key investment selection criterion for VC/BA ([Baum & Silverman, 2004](#)). Moreover, some authors suggest that team quality is relevant not only for pure signalling reasons, but also by the operational capabilities and expertise of the founders ([Bernstein, Korteweg, & Laws, 2017](#)).

The characteristics most frequently used to assess the human capital of entrepreneurs are their previous work (in business or industry-related) and entrepreneurial experience, qualifications, and commitment (perceived passion). Previous business experience provides relevant skills to entrepreneurs (related to negotiation, leading, decision-making and problem solving), which can improve the venture's success ([Shane, 2003](#)). Empirical research shows a positive relationship between the ability to get external financing from VC/BA and the industry experience of entrepreneurs ([Carpentier & Suret, 2015](#)) and the years of experience with young firms ([Hsu, Haynie, Simmons, & McKelvie, 2014](#); [Nofsinger & Wang, 2011](#)). Additionally, business angels usually reject projects when the entrepreneur has no previous experience ([Carpentier & Suret, 2015](#)), and they rely on the competence and trustworthiness of entrepreneurs to reduce the market risk of the new ventures ([Fict, 1995](#)).

Several studies also state the relevance of entrepreneur education for obtaining financing (e.g. [Dickson, Solomon, and Weaver \(2008\)](#)). For instance, [Hsu \(2007\)](#) finds empirical evidence that founding teams with a doctoral degree holder are more likely to obtain financing from VC and their firms receive higher valuations. Others argue that the founder's education is a persistent signal of human capital for investors over time and thus, the education has a positive impact on the amount of funding received not only in the first round of financing but also in the second one, while other signals, such as prior founding experience, has a positive impact only on the first round of financing ([Ko & McKelvie, 2018](#)).

Entrepreneurs highly committed to the project put more effort (time and energy) to achieve venture success. This way, some studies find that commitment (perceived passion) of the entrepreneur is a relevant decision criterion for both venture capitalists and business angels ([Chen, Yao, & Kotha, 2009](#); [Hsu et al., 2014](#); [Mitteneß, Sudek, & Cardon, 2012](#)).

Another dimension analysed in the literature about team management is their size. Some argue that large teams have more capabilities to process information and to provide more viewpoints (and conflicting views reduce the probability of costly mistakes), which can increase firms' performance ([Haleblian & Finkelstein, 1993](#)). For instance, in a study of U.S. semiconductor ventures, [Eisenhardt and Schoonhoven \(1990\)](#) find that a larger top management team, with heterogeneity in industry experience and prior experience together, contributes to the higher growth of start-ups. [Baum and Silverman \(2004\)](#) also suggest that

the number of founders can be a proxy of human quality and find empirical evidence that start-ups with larger top management teams obtain more venture capital financing. Additionally, as larger boards have more difficulties in achieving consensus, it reduces the probability of taking extreme decisions, resulting in lower variations of firm performance ([Cheng, 2008](#)).

As in VC/BA context, some empirical research on the drivers of fundraising success in ECF introduces independent variables related to the human capital of founders and team management. The variables used are related to the team's qualifications ([Ahlers et al., 2015](#); [Barbi & Mattioli, 2019](#); [Battaglia, Busato, et al., 2021](#); [Fajarini, Dalimunthe, & Haikal, 2021](#); [Kleinert et al., 2020](#); [Nitani et al., 2019](#); [Piva & Rossi-Lamastra, 2018](#)), previous start-up and business experience ([Barbi & Mattioli, 2019](#); [Fajarini et al., 2021](#); [Lim & Busenitz, 2020](#); [Mamonov & Malaga, 2018](#); [Nitani et al., 2019](#); [Piva & Rossi-Lamastra, 2018](#); [Ciro Troise et al., 2021](#)), the presence of non-executive directors ([Ahlers et al., 2015](#); [Kleinert et al., 2020](#); [Piva & Rossi-Lamastra, 2018](#); [Vismara, 2016, 2018](#)), team size ([Ahlers et al., 2015](#); [Fajarini et al., 2021](#); [Li et al., 2016](#); [Mamonov & Malaga, 2018](#)), and gender composition of team ([Andrieu et al., 2021](#); [Cicchello, Kazemikhasragh, & Monferra, 2021](#); [Cicchello, Kazemikhasragh, & Monferrà, 2022](#)).

[Ahlers et al. \(2015\)](#) find empirical evidence that the percentage of MBA graduates among executive board members of a founding team is positively related to the number of investors. Similarly, [Kleinert et al. \(2020\)](#) suggest that, on average, firms with high human capital (well-educated teams) attract more investors and have a higher probability of being funded. The positive contribution of the education of the team members to the ECF campaign's success is also confirmed by [Barbi and Mattioli \(2019\)](#), [Nitani et al. \(2019\)](#) and [Battaglia, Busato, et al. \(2021\)](#). However, some argue that not all the previous qualifications are relevant but only business education ([Piva & Rossi-Lamastra, 2018](#)).

Several papers also found evidence of previous entrepreneurial or start-up experience ([Lim & Busenitz, 2020](#); [Piva & Rossi-Lamastra, 2018](#)), experience in business or finance ([Barbi & Mattioli, 2019](#)) and management experience ([Nitani et al., 2019](#)) of the team members have a positive impact on investment decisions in ECF, contributing to the fundraising success.

However, [Piva and Rossi-Lamastra \(2018\)](#) criticize the variables used in some of the previous works to assess the relevance of human capital in ECF. According to them, such variables, as the percentage of team management with an MBA or the number of non-executive directors, are aggregate measures, discarding individual dimensions that are relevant in the ECF context. The authors show that “*the signalling effect of entrepreneurs’ human capital dimensions depends on the signal fit, i.e. the correlation with the unobserved start-up quality* ([Connelly, Certo, Ireland, & Reutzel, 2011](#)), and the signal ambiguity, i.e. the information clarity of the signal” ([Park & Patel, 2015](#))” ([Piva & Rossi-Lamastra, 2018, p. 668](#)). Using a sample of 284 entrepreneurs that launched ECF campaigns in Italy, they find empirical evidence that only human capital signals that are a good fit for start-up quality and have a low degree of ambiguity, such as entrepreneurs’ business education and entrepreneurial experience, contribute significantly to success in equity crowdfunding. Other signals, such as those that have a worse fit (e.g., qualifications or previous work experience in other fields) or that have a good fit but send ambiguous signals (e.g., qualifications and previous work experience in industry-related fields) do not contribute to entrepreneurs’ success in equity crowdfunding.

[Lim and Busenitz \(2020\)](#) also argue that the relevance of previous start-up and management experience of team members on funding differ by entrepreneurial team type: venture founded by a team versus a lone entrepreneur. The authors suggest that previous start-up and management experience is much more relevant for funding success in the case of lone entrepreneurs than in ventures founded by a team.

There is also empirical evidence that team size (number of board members) has a significant positive impact on the success of equity crowdfunding campaigns ([Ahlers et al., 2015](#); [Fajarini et al., 2021](#); [Li et al., 2016](#); [Mamonov & Malaga, 2018](#)). However, these studies don’t find empirical evidence that fundraising success is influenced by the presence of non-executive directors ([Ahlers et al., 2015](#); [Kleinert et al., 2020](#); [Vismara, 2018](#)) or serial founders (if at least one of the founders has started a business before) ([Kleinert et al., 2020](#)).

More recently, some authors also highlight that the presence of women in entrepreneurial team increase the firm’s chances of obtaining equity crowdfunding financing ([Andrieu et al., 2021](#); [Cicchello et al., 2022](#)), while others argue that mixed teams (with the involvement of at least one woman on the board) are significantly more likely to be successful in ECF

campaigns than homogeneous teams (composed entirely of women or men) ([Cicchiello et al., 2021](#)).

[Moritz, Block, and Lutz \(2015\)](#) show that the entrepreneur's personality (perceived sympathy, openness, and trustworthiness) also contributes to the reduction of information asymmetries, which is decisive for investors.

[Lukkarinen, Teich, Wallenius, and Wallenius \(2016\)](#) use a team rating of the project (provided by an experienced former business leader) that gives an overall assessment of team industry expertise, track record, educational background, experience, the balance between team members' skill sets, as well as perceived motivation, drive, passion, commitment, and honesty. However, somewhat surprisingly, they don't find that team rating (as other investment decision criteria traditionally used by VC/BA investors) is significant in predicting funding success and they suggest that a probable explanation is the lower level of expertise of ECF unaccredited investors, in comparison to VC or angel investors.

2.5.1.3. Social capital

According to the theory of entrepreneurship by [Leyden, Link, and Siegel \(2014\)](#), social networks contribute to the promotion of innovation and are used to reduce the problem of information asymmetry in start-up finance, helping investors to decide which ventures to finance ([Shane & Cable, 2002](#)). In the context of crowdfunding, [Lukkarinen et al. \(2016\)](#) note that private networks of entrepreneurs are particularly relevant for attracting early contributions, and social media networks contribute to fundraising success for two reasons. First, publicising the campaigns on social networks (e.g., Facebook, LinkedIn, Twitter) may increase the popularity of the project, attracting new investors to the campaign. Second, entrepreneurs with better quality campaigns may have a higher propensity to spread the campaign on social networks. [Nitani et al. \(2019\)](#) also highlight the relevance of social networks to validate the less reliable project and team information.

This way, literature on equity crowdfunding provides evidence that the size of social networks has a positive impact on fundraising success ([Battaglia, Busato, et al., 2021](#); [Fajarini](#)

[et al., 2021](#); [Lukkarinen et al., 2016](#); [Nitani et al., 2019](#); [Piva & Rossi-Lamastra, 2018](#); [Vismara, 2016](#)).

However, the empirical evidence on the relevance of social networks to the funding success in ECF is not consistent, which seems to be related to the variable used. While the studies that use online networks, like LinkedIn connections of entrepreneurs ([Piva & Rossi-Lamastra, 2018](#); [Vismara, 2016](#)) or the Facebook activity of the company ([Lukkarinen et al., 2016](#)), provide evidence of the positive effect of entrepreneurs' social capital to the success of ECF campaigns, the studies that use the variable percentage of non-executive directors ([Ahlers et al., 2015](#); [Kleinert et al., 2020](#)) find no statistically significant impact of social capital to ECF success. [Ahlers et al. \(2015\)](#) suggest that the variable share of board members holding an MBA beyond being a measure of human capital is also a proxy of the social network given that MBA graduates are usually part of exclusive networks. They find that the variable share of board members holding an MBA has a significant positive effect on the number of investors, but it does not significantly influence the funding amount. These results suggest that social networks are relevant in the context of equity crowdfunding, but in a different way than for traditional sources of financing. While in the context of VC/BA, the relevance of networks is mainly associated with the fact that they provide access to additional resources (such as information and advice) that are critical to early performance, and it can be used as a signal (certification) of venture quality ([Baum & Silverman, 2004](#); [Hoang & Antoncic, 2003](#)), in equity crowdfunding, such aspects of networks seem not to be so important to investors decision. In this context, the relevance of networks looks to be mainly associated with their contribution to attracting new investors (particularly the early investors) to the campaign.

The analysis of social capital has been mainly assessed from the perspective of entrepreneurs in the context of equity crowdfunding, but other authors also examine the impact of social interactions of investors ([Hervé, Manthé, Sannajust, & Schwienbacher, 2019](#)), who find that investors living in more sociable areas tend to invest significantly more in equity crowdfunding.

Table 6 presents a summary of empirical literature about the determinants of the campaign's success in ECF related to signals of the venture's quality (characteristics of the campaign, characteristics of the team and social networks).

Table 6 - Summary of main findings of literature about drivers of fundraising success in ECF related to signals of venture's quality

Paper	Research Design	Data (sample)	Main results/conclusions
Ahlers et al. (2015)	Empirical (quantitative)	104 campaigns from Assob (Australia, 2006-2011)	The probability of funding success is associated positively with signals of project quality (retaining equity and detailed information about risks) and human capital (percentage of board members with MBA and number of board members). However, the authors do not find evidence that social capital (measured by non-executive directors) and intellectual capital (patents) influence funding success. Providing financial forecasts (or a disclosure statement) is an effective signal that reduces the uncertainty of the venture, but probably investors are aware that financial projections are often highly “optimistic”. The empirical evidence is not conclusive about the relevance of the exit channel to funding success.
Li et al. (2016)	Empirical (quantitative)	49 successful projects from the Dajiatou platform (China, 2015)	The fundraising performance increases with the quality of entrepreneurial team information (the ratio of full-time staff, staff number and enterprise business age), the entrepreneurs' behaviours (project updates and project video) and the certification of a lead investor (presence of a lead investor, leader's credibility information and his advocacy behaviours – percentage of their investment, identity certification, investment experience and comments).
Lukkarinen et al. (2016)	Empirical (quantitative)	60 campaigns from Invesdor Oy (Finland, 2012-2014)	Do not find evidence that crowd investment decisions are based on the same criteria as VC/BA (team, market growth, product concept, scalability, terms, and stage). The results suggest that to be successful, the start-ups should start the campaigns only when they ensure a critical mass of investments from networks, the campaign is visible on social media and have a relatively small minimum investment. Firms that offer consumer products also show a higher probability of being successful. Reporting the forecast of financial statements in the campaigns has a positive (not very strong) effect on the attraction of investors but not on the amount raised.
Vismara (2016)	Empirical (quantitative)	271 campaigns from Crowdcube (UK, 2011-2014)	Find empirical evidence that both equity retention and the number of founders' connections have a positive and significant impact on the number of investors and the amount of capital raised in ECF. These results suggest that equity retention is a positive signal of commitment to investors and confirm the relevance of social network theory in the equity crowdfunding context.
Vulkan et al. (2016)	Empirical (quantitative)	636 campaigns from Seedrs (UK, 2012-2015)	Empirical evidence suggests that the main drivers of fundraising success are (1) the share accumulated in the first week of the campaign; (2) the investment goal set by the promoters; (3) the largest amount pledged by a single backer; and (4) the number of backers in the campaign. This way, to have a good start, attract many backers and have at least one backer who provides a large pledge are the most relevant factors to reaching the target amount of funding in ECF. A higher funding target is associated with a lower probability of being successful. Don't find evidence that tax reliefs influence funding success. They also observe herding behaviour in the early stages of a campaign and a significant geographical dispersion among investors.
Löher et al. (2018)	Empirical (quantitative)	36 campaigns from Companisto, Fundsters, Innvestment, and	The financial commitment of the entrepreneurs (including equity and private collaterals of the team before the first ECF campaign starts) is the most important determinant of funding success. Yet, financial commitment might be

Paper	Research Design	Data (sample)	Main results/conclusions
		Seedmatch (Germany, 2011-2014)	due to other forms of individual commitment to business success, such as high working hours or flexibility, intellectual, relational, and emotional resources.
Mamonov and Malaga (2018)	Empirical (quantitative)	133 projects from 16 Title III ECF platforms (USA, 2016-2017)	The market risk (product maturity), execution risk (size and experience of the entrepreneurial team), and agency risk (involvement of professional investors) affect the likelihood of successful fundraising under Title III equity crowdfunding platforms, open to non-accredited investors, in the USA. The likelihood of ECF campaigns' success increases with the company development stage (firms that have completed product or service development and that have large corporate clients), the size of the entrepreneurial team and previous funding from professional VC/BA investors. Single entrepreneurs are less likely to successfully raise funding than entrepreneurial teams. Do not find evidence that patents and experience of the entrepreneurial team influence the success of ECF campaigns.
Piva and Rossi-Lamastra (2018)	Empirical (quantitative)	284 entrepreneurs from SiamoSoci (Italy, 2012-2013)	Focusing their research on the role of human capital in the success of ECF, they find that only signals that are a good fit with start-up quality and have a low degree of ambiguity contribute to the success of ECF. This way, among the variables, used to assess human capital, only business education and entrepreneurial experience have a significant contribution to the campaign's success. Other signals are not relevant because they aren't a good fit for start-up quality (other education and work experience) or because they are ambiguous signals (industry-related education and industry-specific work experience).
Barbi and Mattioli (2019)	Empirical (quantitative)	521 funded firms on the platform Crowdcube (UK, 2011-2017)	Human capital is an important signal of a venture's quality. The education of the team members and the previous professional experience in the field of business/finance/economics contribute positively to the increase in capital raised and the number of investors in ECF campaigns.
Mamonov and Malaga (2019)	Empirical (quantitative)	337 projects from Title II ECF platforms (USA, 2013-2016)	The factors that influence the success of ECF under Title II of the Jobs Act are similar to those used by professional VC investors in traditional offline transactions, given that investors in online ECF platforms also take into consideration the same three types of risks: market risk, execution risk, and agency risk. The likelihood of success in ECF campaigns is positively influenced by market traction, professional investor involvement and the use of video to communicate the information about their venture to potential investors. However, if all factors are considered simultaneously, only professional venture capital involvement remains statistically significant, suggesting that the key success driver is the engagement of professional VC investors before the online ECF campaign. The results suggest that ECF supplements, rather replace, traditional venture funding sources.
Nitani et al. (2019)	Empirical (quantitative)	319 projects from Crowdcube (UK), Companisto (Germany), Invesdor (Finland) and FundedByMe (Sweden) (2014-2015)	Participants in ECF campaigns are rational and interpret properly the signals associated with the firm and owner attributes and financial statements, and they use it to minimize risks and maximize returns. To minimize the risks, they prefer larger firms, managed by experienced and educated management who maintain a relatively large equity stake post-offering. They also prefer projects with better growth opportunities to maximize returns. Social networks also significantly influence investment decisions, suggesting that firms' and entrepreneurs' social networks give investors the chance to validate less reliable information.

Paper	Research Design	Data (sample)	Main results/conclusions
dos Santos Felipe and Ferreira (2020)	Empirical (quantitative)	99 ECF campaigns (Brazil, 2014-2017)	The probability and speed of success of the start-up financing in ECF campaigns are positively affected by the financial goal, the venture category, advisor participation, the campaign duration, and the type of equity offered.
Kleinert et al. (2020)	Empirical (quantitative)	221 campaigns from Crowdcube (UK, 2017-2018)	Firms that have previously raised funding (from BA, VC, Crowdfunding or Grants) have a significantly higher probability of being successful in ECF campaigns, confirming the certification effect of prior financing. Such effect is higher when the firm were subject to a double-screening process (received financing from different types of investors). This study also confirms some prior results of research on crowdfunding, namely that the founder's education, larger funding target and firms with an exit plan attract more investors.
Kuselias (2020)	Empirical (quantitative)	151 participants in a survey	Social information (information and opinions online about a particular organization shared by website users) influences investment decisions in ECF. Positive social information induces crowd investors to invest more in a particular campaign and this effect is stronger for shared identifiers (compared to non-identifiers). However, even negative social information can cause a certain subset of shared identifiers to invest more in an organization with relatively weak financial performance.
Lim and Busenitz (2020)	Empirical (quantitative)	89 ECF campaigns from Crowdfunder (USA, 2015-2016)	The relevance of human capital characteristics (e.g., start-up experience and management experience) on funding differ by entrepreneurial team type (venture founded by a team versus a lone entrepreneur). While management experience with large organizations does not impact equity crowdfunding success, management experience in small organizations matters for lone entrepreneur ventures. Furthermore, the lack of start-up experience in previous ventures and management experience in small organizations on funding success is less relevant for ventures founded by an entrepreneurial team (instead of an individual).
Ralcheva and Roosenboom (2020)	Empirical (quantitative)	2171 campaigns from Crowdcube and Seedrs (UK, 2012-2017)	The ECF market is becoming more mature, with campaigns with higher target amounts driven by older companies. The success rate of the campaigns has been increasing over time. Although the type of company seeking ECF has changed over time, the success factors of ECF campaigns remain the same. The ECF campaign's success can be estimated using a simple model based on information available at the time of the campaign.
Andrieu et al. (2021)	Empirical (quantitative)	184 funded firms from 4 ECF platforms in France (2010-2017)	The crowd's propensity to finance start-ups is significantly lower when the firm is led by a woman.
Battaglia, Busato, et al. (2021)	Empirical (quantitative)	191 campaigns from all Italian ECF platforms (2014-2018)	Intellectual capital (measured by the number of patents, the amount spent by the firm in developing new innovative products and services, and the team's education level), equity retained, and social capital (size of social network) are perceived as signals of venture's quality by external investors and contribute positively and significantly to the success of ECF campaigns.
Cicchello et al. (2021)	Empirical (quantitative)	492 campaigns from all ECF platforms in Brazil, Chile, and Mexico (2013-2017)	Gender equality in the firms' boards influences positively the success rate of ECF campaigns. Firms with mixed teams (with the involvement of at least one woman on the board) are significantly more likely to be successful in ECF campaigns than firms with homogeneous teams (composed entirely of women or men).

Paper	Research Design	Data (sample)	Main results/conclusions
Ciro Troise et al. (2021)	Empirical (quantitative)	108 campaigns from 7 ECF platforms in Italy (2014-2019)	The three dimensions of intellectual capital (human, structural and relational) signal the quality of start-ups and induce crowd investors to invest in ECF campaigns. Factors related to human capital (prior industry and start-up experience) and structural capital (product innovation and intellectual property) have a positive, but limited, impact on investment decisions. Both the variables of relational capital (partnerships and third-party endorsement), influence significantly and positively the investment decisions of crowdfunders.
Fajarini et al. (2021)	Empirical (quantitative)	201 successful campaigns from Asia (Indonesia, Malaysia, United Arab Emirates, Israel, and South Korea, 2018-2019)	It analyses the influence of three groups of factors on the success of ECF campaigns: campaign characteristics, human capital, and social capital. The most relevant variable among campaign characteristics is the financial information provided. The number of videos and pictures on the pitch is not relevant for fundraising success. Except for the number of team members, other human capital factors (high level of education, business experience and experience in the field) influence positively the campaign's success. Both social capital factors (owner social networks and number of advisors) have a significant positive relationship with the success of ECF campaigns.
Fricke, Fung, and Goktan (2021)	Empirical (quantitative)	886 equity crowdfunded firms (USA, 2013-2014)	The limited information disclosure requirements of ECF do not lead to a lemon market, in which lower-quality companies can take advantage. It still attracts quality start-ups, and accredited investors can identify quality by observing credible signals to select the best campaigns. Observable firm characteristics (age, merger-related offerings, tech company, and smaller minimum investment) and VC monitoring are associated with success in accredited crowdfunding markets.
Smirnova et al. (2021)	Empirical (quantitative)	750 campaigns (USA, 2016-2018)	The probability of crowdfunding success is lower for equity instruments (including SAFEs - Simple Agreements for Future Equity) compared with debt securities. The likelihood of crowdfunding success is higher for larger and more profitable companies. As the funding instrument has a negligible impact on the amount raised and the probability of success for equity issuers is reduced, entrepreneurs should rely more on debt and convertibles (instead of equity) when designing crowdfunding campaigns.
Li et al. (2021)	Empirical (qualitative)	40 campaigns with lead investors from Mayiangel platform (China, 2019)	This study explores the signalling mechanism between investors, through which the lead investor drives the investments of amateur investors (followers). Lead investors attract follow-investors into the ECF because they are seen as signs of start-up quality, contributing to the success of ECF campaigns. To join a lead investor's syndicate, following investors are relatively tolerant of the abilities of lead investors. However, they are more cautious in providing funds for ECF campaigns led by these investors. Follow investors are more likely to support lead investors with experience in both traditional investments and crowdfunding, who can identify a firm's potential without bias and know well about the management of an organization.
Cicchello et al. (2022)	Empirical (quantitative)	492 campaigns from all ECF platforms in Brazil, Chile, and Mexico (2013-2017)	The presence of women on the entrepreneurial team increases the firm's chances of obtaining equity crowdfunding financing and reaching the fundraising goal, but it is not significantly related to the likelihood of the campaign's overfunding.

2.5.2. Information disclosure

As stated before, the investment in start-ups is involved in large asymmetries of information. While VC/BA use pre-investment due diligence and face-to-face meetings to assess the project and entrepreneur quality, in ECF the information is disclosed online, through the crowdfunding platform. Although some platforms promote pitch sessions, where investors and entrepreneurs may interact, given the geographical dispersion of investors ([Agrawal et al., 2015](#)), many investors never know the entrepreneurs personally. The description of the project, entrepreneurs, and campaign conditions are usually provided in a standardized form through the platform. The soft facts, i.e., the overall impression of the ventures (perceived sympathy, openness, and trustworthiness), are also communicated over the internet (videos, investors forums and social media) instead of traditional personal communication ([Moritz et al., 2015](#)).

Thus, during the ECF campaign, the team usually interact with investors, either through posting updates of the campaign (e.g., media coverage, highlighting an investment from a known business angel, etc.) or by answering the questions or comments of investors. Sometimes entrepreneurs also provide supplementary documents (e.g., forecast financial statements) or give additional information potentially useful for investors (e.g., planned exit channel and expected time to exit). This way, some authors argue that the additional information provided by other documents (business plan and forecast financial statements), exit options, and interactions with investors, through updates and comments, helps to reduce the information asymmetries and enhance the likelihood of the campaigns being successful ([Ahlers et al., 2015](#); [Guenther et al., 2018](#); [Hornuf & Schwienbacher, 2018b](#); [Kleinert & Volkmann, 2019](#); [Lukkarinen et al., 2016](#); [Piva & Rossi-Lamastra, 2018](#); [Vismara, 2016](#)).

In general, empirical research is consistent with the view that updates and comments increase funding success since it complements the standardized information provided on the pitch ([J. Block et al., 2018](#); [Dorfleitner, Hornuf, & Weber, 2018](#); [Hornuf & Schwienbacher, 2018b](#); [Kleinert & Volkmann, 2019](#)). However, such impact depends on the type of interaction and the contents of the updates and comments. First, as many comments are just “good luck” statements, in comparison with updates, they tend to be more frequent but with a lower economic value ([Hornuf & Schwienbacher, 2018b](#)). Other authors argue that not all updates

are valuable and influence investors' decisions. For instance, [J. Block et al. \(2018\)](#) argue that posting many updates reduces its credibility and can be perceived as “cheap talk” while updates related to campaign development, new funding, business development and cooperation projects have a positive and significant impact on crowd participation, other updates are irrelevant to investors (namely, updates about start-up team, business model, product developments or campaigns promotions). Similarly, the value of comments seems to depend on their contents and the funding phase of the ECF campaign. For instance, [Hornuf and Schwenbacher \(2018b\)](#) suggest that the most valuable comments are related to valuable information, offers help, second timing investment and comment length, and the impact of comments is reduced after the funding target is achieved. According to [Kleinert and Volkmann \(2019\)](#), the most relevant topics in comments are related to the competitive landscape, return potential of the venture and agency risk (shareholders rights).

While empirical research confirms that, in general, providing additional information (in the form of updates and comments) has a positive influence on the outcome of the campaign, some authors point out that the type of language used ([Dority, Borchers, & Hayes, 2021](#)), the tone (positive words) ([Pattanapanyasat, 2021](#)), the number of pictures ([Borello, De Crescenzo, & Pichler, 2019](#); [De Crescenzo, Ribeiro-Soriano, & Covin, 2020](#)) and visual cues (logos) ([Mahmood, Luffarelli, & Mukesh, 2019](#)) could also be relevant for funding success.

Another venue of empirical research is the signal value of other information, such as financial forecasts or potential exit channels. However, empirical research is not conclusive about the influence of providing such information on the funding success of ECF campaigns.

[Ahlers et al. \(2015\)](#) find empirical evidence for the signalling value of financial forecasts and the inclusion of a disclaimer for the campaigns on the ASSOBS platform. They found that campaigns without financial forecasts (or a disclaimer) have, on average, a lower funding amount than campaigns that provide such information. Even so, this difference is not found when comparing the total funding amount of campaigns with financial forecasts and campaigns without financial forecasts, but with a disclaimer. The authors argue that providing financial forecasts is an effective signal, that reduces uncertainty about the venture (information asymmetries), but probably investors are aware that financial projections are often highly “optimistic”, so they do not differentiate between the two groups (those that

provide a disclaimer and those that provide financial forecasts). Still, these results are not confirmed in other studies. For instance, [Lukkarinen et al. \(2016\)](#), using a sample of campaigns in a Finnish platform, find that the availability of financials is positively associated (even if not very strongly) with the number of investors, even if it is not significantly related to the amount raised. Moreover, the quality of financials is not related to campaign success. According to the authors, it appears that while it may be useful to provide some financials in the campaign, the attractiveness of these financials may not be as relevant as expected. [Piva and Rossi-Lamastra \(2018\)](#), using a sample of campaigns in an Italian platform, don't find evidence of the significant influence of providing other documents on the probability to meet target capital or attracting a higher number of investors. On the contrary, [Pattanapanyasat \(2021\)](#) find evidence that, in Australia, investors do larger investments in campaigns that provide financial statements, suggesting that their availability reduces information asymmetries and helps investors to make more informed decisions in ECF. Overall, these results, somewhat contradictory, suggest that further research on this subject is needed.

Some authors also provide empirical evidence that providing information on a potential exit increases the likelihood of the ECF being successful and attracts a higher number of investors ([Kleinert et al., 2020](#)). Others analyse not only if the company provides information about a potential exit, but compare the relevance of different exit channels (IPO, Trade sale or other) and the number of years until the planned exit ([Ahlers et al., 2015](#); [Vismara, 2016](#)). Nevertheless, the results are not clear. On one hand, [Ahlers et al. \(2015\)](#) find that "proposed exit channel" and "years to planned exit" are statistically different for successful and unsuccessful campaigns, and that, in comparison to other exit channels, the IPO exit channel attracts a significantly larger number of investors, even if they don't find evidence that exit channel influences the funding amount, neither that "years to planned exit" influences the number of investors or the funding amount. On the other hand, [Vismara \(2016\)](#) doesn't find evidence that the intention to have an IPO exit significantly affects the campaign outcome (neither in the number of investors nor in the funding amount). He also finds that projects with a long-term exit option (after more than five years) attract fewer investors, but the duration of the exit option is irrelevant to the funding amount. A probable explanation for these contradictory results is related to the fact that investors could see the information about exit options as "cheap talk" ([Ahlers et al., 2015](#)).

More recently, some authors pointed out that not all the information provided by entrepreneurs on their ECF campaigns is relevant. [Johan and Zhang \(2020\)](#) distinguish the business information provided by firms in ECF campaigns into two types: quantitative (costly and verifiable) and qualitative (costless and difficult to verify). They find evidence that both quantitative and qualitative information has a significant impact on equity crowdfunding outcomes, but the fundraising outcomes are negatively influenced by excessive use of promotional language about the business. [Estrin, Khavul, and Wright \(2022\)](#) suggest that more than hard information (easily verifiable information, such as the entrepreneur's demographics, the firm's age, size, location, and industry), soft information (more difficult to verify and interpret, therefore more expensive to obtain, such as firms' growth prospects, the largest amount invested, and the number of investors) has a positive impact on the likelihood of an ECF campaign be successful. Similarly, [Di Pietro, Grilli, and Masciarelli \(2020\)](#) suggest that while costly information (past achievements related to firm performance, existing users, partnerships, founder's experience, etc.) can reduce information asymmetries and convey a positive signal about the firm's ability to deliver on its promises, costless signals (plans about product development, expansion ambitions, prospective exit strategy) are valued negatively by potential investors. However, the negative effects of costless signals are reduced or eliminated when the project involves a radical innovation.

Others, also suggest that when investors perceive that the information shared in ECF campaigns is credible (i.e., of good quality), it helps the investor to assess the investment and reduces the investment risk, but the quality of information disclosed is even more relevant to reducing the investment risk in the presence of sufficient laws and regulations related to crowdfunding, confirming the argument that regulations are important for the credibility of information disclosed in ECF ([Wasiuzzaman, 2021](#)).

Table 7 presents a summary of empirical literature about the determinants of the campaign's success in ECF related to information disclosure.

Table 7- Summary of main findings of literature about drivers of fundraising success in ECF related to information disclosure

Paper	Research Design	Data (sample)	Main results/conclusions
Moritz et al. (2015)	Empirical (qualitative)	23 interviews with market participants from 3 ECF platforms (Germany)	The overall impression of the venture (perceived sympathy, openness, and trustworthiness) plays an important role in reducing information asymmetries perceived by investors. These soft facts are communicated via the internet (videos, investor forums and social media) rather than traditional face-to-face communication. In addition, third-party endorsements (crowd investors, professional investors, and other stakeholders) reduce perceived information asymmetries and influence the decision-making process of investors in ECF.
J. Block et al. (2018)	Empirical (quantitative)	71 Campaigns from Seedmatch and Companisto (Germany, 2012-2015)	Updates influence positively both the number of crowd investments and the investment amount, and this effect is more pronounced when used ease language in the update. However, posting many updates reduce its credibility and can be perceived as “cheap talk”. While updates related to campaign development, new funding, business development and cooperation projects have a positive and significant impact on crowd participation, other updates are irrelevant to investors (e.g., updates about start-up teams, business models, product developments or campaign promotion).
Dorfleitner et al. (2018)	Empirical (quantitative)	751 updates and 39,036 investment decisions from campaigns in Seedmatch and Companisto (Germany, 2012-2015)	Start-ups use updates during ECF campaigns to strategically communicate with entrepreneurs and to increase the probability of success of the campaign. Moreover, this communication changes throughout the funding phases. During the funding period, updates are more frequent and have specific content (linguistic devices evoking a feeling of group cohesion and improving group identity, as well as information about business development). The frequency of updates increases in the presence of a higher number of competing offers. However, the sentiment of the updates is not significantly different between the funding period and the period thereafter.
Borello et al. (2019)	Empirical (quantitative)	212 campaigns from FundedByMe (Sweden), Invesdor (Finland), and Seedmatch (Germany) (2011-2015)	Equity crowdfunders are more likely to finance early-stage firms operating in non-high-tech industries, in the presence of updates and the provision of a business plan. However, an excessive number of pictures and higher competition across or within platforms negatively affect funding. The presence of rewards is not significant. The capital raised increases with the age of the firm suggesting that investors understand that older firms require a more considerable amount of capital to expand their business.
Kleinert and Volkman (2019)	Empirical (quantitative)	2258 daily investments of 47 campaigns from Crowdcube (UK, 2015)	Results confirm that discussion forums complement the standardized information provided on the pitch. The most frequent discussion topics are related to financials (valuation, market risk, financial snapshot, projected returns, and shareholders’ rights), which reflects the investors’ concerns about agency problems, lack of detailed information about the competitive landscape and excessively optimistic financial forecasts. Overall, the number of discussion topics has a positive impact on the number of investments, but the effect depends on the discussion topics. For instance, discussions on market risk and shareholder rights negatively influence campaign success. Results confirm findings of other studies such as herding behaviour and signalling effects of updates. The investments are negatively associated with the number of competing projects on that day.

Paper	Research Design	Data (sample)	Main results/conclusions
Mahmood et al. (2019)	Empirical (quantitative)	I: 2630 respondents on Amazon Mechanical Turk; II: 10,611 investments of 5427 backers in 62 ECF (USA, 2015-2016); III: 200 individuals	Using three studies (a survey, a field study, and an experiment), they find that low-validity visual cues (such as logos) can influence investors in ECF campaigns. They find support for the proposition that logo complexity (perceived as less familiar and thus more original) can be interpreted by backers as a signal of venture innovation, and thus positively impact backers' funding decisions.
De Crescenzo et al. (2020)	Empirical (qualitative)	344 campaigns from Crowdcube (UK, 2016-2017)	Crowdfunding success and failure are associated with different combinations of conditions. The key factors associated with successful ECF campaigns are a large number of founders and numerous pictures. Failed ECF campaigns disproportionately occur in firms that have no female founders, are in traditional sectors (non-cleantech firms), are older firms, and publish few pictures but offer rewards for investors.
Di Pietro et al. (2020)	Empirical (quantitative)	597 funded firms from Crowdcube and Seedrs (UK, 2017-2019)	Distinguishes the relevance of costly and costless signals to ECF fundraising success. Costly signals (past achievements related to firm performance, existing users, partnerships with industry incumbents, founder's industry, business experience, etc.) reduce information asymmetry and convey a positive signal about the firm's ability to deliver on its promises. Costless signals (firm's plans for product development, expansion ambitions, prospective exit strategy) are valued negatively by potential investors. As such, firms are more likely to reach their fundraising goal if they provide the crowd with more information about past achievements (costly signals). However, the negative effects of costless signals are reduced or eliminated when the project involves radical innovations.
Johan and Zhang (2020)	Empirical (quantitative)	6870 start-ups (USA, 2007-2016)	The authors distinguish the business information provided by firms in ECF campaigns into two types: quantitative (costly and verifiable) and qualitative (costless and difficult to verify). It finds evidence that not only quantitative business information but also qualitative business descriptions have a significant impact on equity crowdfunding outcomes. The probability of funding success and the amount of capital raised are both higher when firms provide a more detailed qualitative business introduction. Still, fundraising outcomes are negatively influenced by the excessive use of promotional language in the business.
Dority et al. (2021)	Empirical (quantitative)	>3,200 equity offerings from 12 Title II platforms (USA, 2013-2016)	Using textual analysis of the ECF environment in the USA, the paper provides empirical evidence that the language used (e.g., sentiment) in ECF campaign descriptions influences campaign success. It finds an inverted U-shaped relationship between information quantity, information quality and tone and the success of an ECF campaign, suggesting that the optimal result is achieved when it is used an intermediate level of information – quantity, quality, and tone.
Pattanapanyasat (2021)	Empirical (quantitative)	228 ECF firms from the ASSOBA (Australia, 2007–2014)	The availability of financial statements reduces the information asymmetry between firms and investors, helping investors to make more informed decisions in ECF. Investors make larger investments when they have access to the financial statements of the firms. In addition, it influences how investors view other aspects of the disclosure in other documents, namely the use of positive words (tone). In the presence of financial statements, investors' negative response to the tone is more pronounced.

Paper	Research Design	Data (sample)	Main results/conclusions
Wasiuzzaman (2021)	Empirical (quantitative)	169 ECF investors (Malaysia)	Information disclosure and regulation reduce the risk of investing in ECF campaigns. When investors perceive that the information shared in ECF campaigns is credible, it helps the investor assess the investment and reduces the investment risk. However, when ECF regulation is introduced as a moderating variable, the significance of perceived information quality in reducing investment risk is even higher. The results suggest that the quality of information disclosed is more relevant to reducing the investment risk in the presence of sufficient laws and regulations related to crowdfunding, confirming the argument that regulations are important for the credibility of information disclosed in ECF campaigns.
Estrin et al. (2022)	Empirical (quantitative)	165,000 investors and 835 campaigns from Crowdcube (UK, 2011-2015)	More than hard information (of general agreement and easily verifiable information, such as the entrepreneur's demographics, the firm's age, size, location, and industry), soft information (more difficult to verify and interpret, therefore more expensive to obtain, such as firms' growth prospects, the largest amount invested, and the number of investors) has a positive impact on the likelihood of an ECF campaign be successful. As ECF platforms facilitate the rapid exchange of soft information among their network, the size of the investor network on the platform facilitates the transmission of soft information, contributing to the success of ECF campaigns.

2.5.3. Other motivations

In addition to financial return (equity share), in some ECF campaigns, the entrepreneurs also offer non-monetary returns (e.g., product samples or experience, as in a reward-based model) or investors can benefit from tax reliefs. In the United Kingdom, there are two tax breaks for investors in start-ups: EIS (Enterprise Investment Scheme) and SEIS (Seed Enterprise Investment Scheme). Both tax schemes aim to help small and high-risk firms raise finance by offering tax relief on new shares. At EIS, investors may receive (until) 30% tax relief on investments up to £ 1,000,000 in any tax year. The SEIS scheme aims to encourage seed investment, and investors, including directors, can receive initial tax relief of 50% on investments up to £100,000 and a Capital Gain Tax (CGT) exemption for any gains on the SEIS shares. In the SEIS scheme, the maximum amount to be raised for each company is £150,000. However, only qualified companies may benefit from these tax reliefs. This way, some authors explore if the decision to invest is influenced by the offer of non-monetary returns or tax reliefs. However, empirical research finds no evidence that neither the provision of non-financial rewards nor tax reliefs ([Vismara, 2016, 2018](#); [Vulkan et al., 2016](#)) have an impact on the probability of success of ECF campaigns ([Cholakova & Clarysse, 2015](#); [Vismara, 2016](#)).

Others also investigate if non-financial motivations, such as being part of a community, or the social and sustainability orientation of ECF projects influence investment decisions. The empirical evidence does not confirm that non-financial motives have a significant role in investment decisions ([Cholakova & Clarysse, 2015](#); [Wasiuzzaman, 2021](#)), and there are mixed results for the social or sustainability orientation of ECF campaigns. While [Vismara \(2019\)](#) provides evidence that the sustainability orientation of ECF ventures does not increase the likelihood of campaign success or the ability to attract professional investors, [Hörisch and Tenner \(2020\)](#) find that projects with an environmental orientation (but not those with social orientation) reach more funders, which increases the probability of funding success in ECF. This way, the overall motivation of investors in ECF is financial ([Cholakova & Clarysse, 2015](#)). **Table 8** summarises the literature on the drivers of fundraising success related to the non-financial motivations of investors.

Table 8 - Summary of literature about drivers of fundraising success in ECF related to non-financial motivations of investors

Paper	Research Design	Data (sample)	Main results/conclusions
Cholakova and Clarysse (2015)	Empirical (quantitative)	155 campaigns from Symbid (Netherlands)	Non-financial motives (help others, support ideas or be part of a community) don't play a significant role in the decision to pledge (reward model) or to invest (in equity model) into a campaign. The overall motivation is financial/utilitarian. To be successful in reward crowdfunding it is crucial to offer an attractive reward, as the expected product is the main motivation to pledge. In equity crowdfunding, the financial return is the only motivation for investors that decided to invest.
Vismara (2019)	Empirical (quantitative)	345 campaigns from Crowdcube and Seedrs (UK, 2014–2015)	It provides evidence that the sustainability orientation of ECF ventures does not increase the likelihood of campaign success or the attraction of professional investors but allows it to attract a higher number of (restricted) investors. Considering two groups of investors, they suggest that while professionals follow a market logic (they are purely financial investors interested in corporate control and realizing monetary returns), restricted investors also consider a community logic (which involves cooperative capitalism, a commitment to community values, and belief in trust and reciprocity).
Hörisch and Tenner (2020)	Empirical (quantitative)	318 environmental and social projects (USA & Germany, 2018)	It investigates the sustainability-oriented ventures in equity crowdfunding and finds different results for the influence of environmental and social orientation on fundraising success. Contrary to Vismara (2019) , the authors find that projects with an environmental orientation reach more funders, which increases the funding success of ECF campaigns. However, projects with social orientation cannot attract more funders or increase fundraising success.
Wasiuzzaman, Lee, Boon, and Chelvam (2021)	Empirical (quantitative)	169 responses from investors in ECF platforms in Malaysia	Investors in ECF in Malaysia are more focused on intrinsic motivations rather than extrinsic ones. The decision to support equity crowdfunding is positively influenced by all intrinsic factors (aesthetic value, emotional value, novelty, and trust), except for the desire to be part of a community. In contrast, extrinsic motivation (financial gains) is found to have an insignificant influence on investment decisions.

2.5.4. Investment process of ECF campaigns

2.5.4.1. ECF campaign dynamics

Some empirical research also explores the relevance of the investment dynamics during the ECF campaign on fundraising success. Several studies in crowdfunding observe that the propensity for funding increases with accumulated capital, suggesting the existence of a herding behaviour of investors ([Agrawal et al., 2014](#)). This behaviour is found in different crowdfunding models, such as in microloans platforms (e.g., [Zhang and Liu \(2012\)](#)), reward crowdfunding (e.g., [Kuppuswamy and Bayus \(2014\)](#)), as well as in the ECF environment, ([Agrawal et al., 2015](#); [Hornuf & Schwienbacher, 2018b](#); [Vismara, 2018](#)).

[Vismara \(2018\)](#) explores the role of information cascades among individual investors in equity crowdfunding. He finds that the higher the percentage of investors with a public profile, the higher the number of early investors, and then the higher the number of later investors. This way, the number of early investors influence positively the campaign's success, suggesting that undecided investors observe the behaviour of early investors to make their investment decisions (observational learning), i.e., early investors transmit a relevant and positive signal to late investors. However, the author recognizes that other explanations may justify these results: (i) attracting many early investors may have a positive payoff externality because such campaigns have a higher probability of being successful thus the investors avoid wasting time and resources in investing in failed campaigns; (ii) large early investors reduce uncertainty but also contribute to the accumulated amount raised and consequently increases the probability of success; (iii) many early investors may leverage the effect of "word of mouth", (iv) some investors may prefer to invest later, after seeing how the campaign develops and (v) other behavioural causes, such as procrastination or conformity, may explain the late biddings. In particular, the last explanation may justify the increased number of investors in the last days of the successful campaigns (after they reach the campaigns' target amount). Even so, the author argues that herding can be a rational decision. Considering that investors may invest very small amounts, such as 10 pounds, the costs of evaluating properly each firm can be disproportionately high. Additionally, as many of the investors in equity crowdfunding are not qualified, they cannot have the tools to

distinguish good from weak projects. So, it can be rational for investors to observe and use the information about the behaviour of previous investors to make their investment decision.

The importance of early investments is also stated by [Vulkan et al. \(2016\)](#). Using a sample from the Seedrs platform, the authors find that one of the factors that are more strongly associated with the probability of success is the capital share accumulated in the first week of the campaign.

The herding behaviour of investors during the campaign may have two consequences: (i) induce subsequent investors to deviate from their typical investment behaviour ([Walther & Bade, 2020](#)) and (ii) over funding popular campaigns ([Li, Liu, Fan, Lim, & Liu, 2020](#)).

[Walther and Bade \(2020\)](#) find evidence that investors observe previous investments to determine their willingness to pay for equity shares and it can induce investors to deviate from the typical investment behaviour on the platform. The investors are willing to pay more for popular campaigns and for projects that had many large investments in the campaigns. However, crowd investors are also subject to partial crowding-out because their willingness to pay is lower for projects with a high number of previous investments over the entire campaign period, as well as those co-financed by sophisticated investors. Overall, the authors propose that the investment behaviour of predecessors can induce deviations in the investment behaviour of subsequent investors.

[Li et al. \(2020\)](#) propose that the initial herd induces the overfunding of campaigns, leading to a suboptimal allocation of scarce monetary resources, which is one of the main causes of market inefficiencies on ECF platforms. The authors also propose that the overfunding problem can be mitigated by ECF platforms by delaying the initial herd formation and hiding the fundraising progress for a short period during the launch of the campaign.

[Hornuf and Schvienbacher \(2018b\)](#) argue that the funding dynamics during the campaign also depend on the mechanism of share allocation to investors used by ECF platforms. While the equity crowdfunding dynamics are L shaped under a first-come, first-served mechanism (most common) because this mechanism induces quick investments during the first days and

investors prefer to bid in the early days to guarantee the investments, the auction mechanisms induce late investments, and the typical pattern of project support is U shaped.

According to [Nguyen, Cox, and Rich \(2019\)](#), the investment activity (the number of investments and capital raised) increases significantly in the last days of the campaigns. Considering that investments in ECF are characterised by low levels of irreversibility, moderate costs of delay and high levels of uncertainty, the authors propose that investors may rationally delay their investments to gain new information about the quality of projects. Moreover, this evidence is consistent with options theory because the increase in investment activity in the last few days is more pronounced for campaigns with higher levels of uncertainty and lower costs of delay.

A different perspective on the dynamics of ECF campaigns is analysed by [Meoli and Vismara \(2021\)](#). Using a sample of 64 offerings launched on a leading ECF platform, they observe that (i) all offerings have investment withdrawals, (ii) on average, 10.2% of investments are withdrawn before the end of the offering and (iii) platform member are 1.85 times more likely to withdraw than the average crowdfunding investor. Analysing the timing of the investment's withdrawals they draw two conclusions. First, the investments that are later withdrawn usually occur at the beginning of the offering. Second, the withdrawals occur more frequently in low-quality characteristics offerings and those with poor campaign dynamics, i.e., in those campaigns that may depend more on investors' signals to ensure success. According to the authors, this evidence suggests that investment withdrawals are related to information manipulation purposes. Alternative explanations for withdrawals due to information asymmetry problems between the investor and the company (changes in investment decisions motivated by a change in the information available to investors) are less plausible because the withdrawals are more frequent for platform members that are less exposed to information asymmetry problems.

The literature on the dynamics of crowdfunding campaigns is based almost exclusively on the online phase of the campaign. One exception is [Cumming, Hervé, Manthé, and Schwienbacher \(2020\)](#) who analyse the pre-investment phase (also called the e-vote phase) used by some platforms to “test the waters” (i.e., to request indications of investor interest before launching the campaign on the platform). In this pre-investment phase, the interested

investors declare their investment intentions and provide feedback (e.g., grades) on the proposed project before the campaign started. While this pre-investment phase is very useful for the platform to decide whether to allow the campaign to be launched online in the platform, [D. Cumming et al. \(2020\)](#) find evidence that many investors that participate in this pre-investment phase withdraw their investment intention when a campaign is started, suggesting that investors suffer from hypothetical bias. This bias refers to the fact that individuals make different decisions in a hypothetical situation than in a real one, leading individuals to withdraw from earlier commitments. However, despite the significant deviation in individual behaviour (given the low transformation ratio and high withdrawal rate of voters - an investor only invests around 18% of his/her commitment in the pre-investment phase), the aggregate level of commitment remains a good predictor of campaign success, providing a good estimation of the future collective behaviour of investors.

2.5.4.2. Competition

As campaigns compete for funding, if the funds of investors are relatively fixed, thus the probability of funding in a certain project depends on the number of competitive campaigns that are active at that time. Previous empirical evidence about crowdfunding shows a negative effect between the number of active campaigns and the probability of success for other crowdfunding models, such as in reward model ([Thies, Wessel, & Benlian, 2018](#)), in microfinance ([Ly & Mason, 2012](#)) and donation model ([Meer, 2014](#)). These results are consistent with the idea of the “Blockbuster Effect”, according to which a popular (with a large number of backers) and widely visible project steals potential backers from other projects ([J. Block et al., 2018](#)).

However, in the Equity Crowdfunding model, such evidence is less clear. Only a few papers consider the competition among the independent variables (usually only as a control variable) about drivers of fundraising success and the results are somewhat inconsistent. While [Vismara \(2018\)](#) suggest that the attractiveness of each campaign is negatively affected by the presence of a larger number of competing offerings, [Hornuf and Schvienbacher \(2018b\)](#) find that more activity in general (a higher number of competing investments) and the number of active campaigns (competition) increase the number of investments in a particular

campaign on a specific day. The authors argue that these results could be explained by the collective attention effect of crowdfunding, given that a higher number of active campaigns increases the spread of news about equity crowdfunding in general. They also suggest that the lack of the “Blockbuster Effect” is because, contrary to the reward model, in equity crowdfunding, the campaigns are not open-ended and there is a limit to the campaign size (limited investment in each campaign).

Thus, given the scarce and contradictory empirical evidence on the effect of competition on fundraising success in equity crowdfunding, further investigation on this issue is needed.

In **Table 9** there is a summary of the literature about the drivers of the fundraising success related to the investment process of ECF campaigns.

Table 9 - Summary of literature about drivers of fundraising success in ECF related to the investment process of ECF campaigns

Paper	Research Design	Data (sample)	Main results/conclusions
Vismara (2018)	Empirical (quantitative)	132 campaigns from Crowdcube (UK, 2014)	Find evidence of information cascades among individual investors. Early investors are attracted by investors with a public profile, and then these early investors attract late investors, increasing the probability of success of ECF campaigns.
Nguyen et al. (2019)	Empirical (quantitative)	2068 daily observations of investments from 91 campaigns from Crowdcube (UK, 2015-2016)	As investments in ECF are characterised by low levels of irreversibility, moderate costs of delay and high levels of uncertainty, the investors rationally delay their investments expecting to get new information about the quality of projects. This way, the investment activity (the number of investments, average investment amount and the amount of capital raised) increases significantly in the last days of ECF campaigns. Consistently with real options theory, the increase in investment activity is more pronounced for campaigns with higher levels of uncertainty and lower costs of delay.
D. Cumming et al. (2020)	Empirical (quantitative)	23827 potential investors from WiSEED (France, 2009-2016)	When participating in precampaign votes of ECF platforms, on average, an investor only invests around 18% of his/her (nonbinding) commitment, suggesting that crowd investors are subject to a hypothetical bias. Withdrawals are more frequent among men and investors who live in poorer and less educated neighbourhoods. Despite the significant deviations observed in terms of individual behaviour, the aggregate level of commitment remains a good predictor of campaign success.
Walther and Bade (2020)	Empirical (quantitative)	68,662 investments from 101 campaigns in Companisto (Germany, 2012-2019)	Investors observe previous investments to determine their willingness to pay for equity shares which may lead investors to deviate from the typical investment behaviour on the platform. Investors are willing to pay more when the campaign is hot (the most popular campaign on the platform) or there have been many large investments in the campaign. However, the willingness to pay is negatively influenced by the total number of previous investments over the entire period of the campaign and by the co-financing of sophisticated investors (venture capitalists or business angels), suggesting that crowd investors are subject to partial crowding-out.
Li et al. (2020)	Empirical (quantitative)	192 successfully funded campaigns (UK, 2011-2015)	Many of the successful campaigns on ECF are overfunded, leading to a suboptimal allocation of scarce monetary resources, which is one of the main causes of market inefficiency on ECF platforms. Initial herd, made visible by the funding progress indicator, is the main cause of overfunding. It is found that overfunding is positively associated with the three dimensions of the initial herd: maturity (timing when an initial herd picks up momentum), intensity (number of funders it galvanized at its peak) and persistency (the duration for which this initial herd can persist). The authors suggest that crowdfunding platforms can reduce overfunding problems by delaying the initial herd formation and hiding the fundraising progress for a short period during the launch of the campaign.

Paper	Research Design	Data (sample)	Main results/conclusions
Meoli and Vismara (2021)	Empirical (quantitative)	3564 investments by 2163 individual investors in 64 offerings (two-year period)	Empirical analysis of investment withdrawals in ECF. It was found that in all offerings there are investment withdrawals and, on average, 10.2% of investments are withdrawn before the end of the offering. However, the frequency of investment withdrawals is higher for platform members (1.85 times more) than for other investors. Timing analysis of the investments confirms that withdrawals may be related to information manipulation purposes. On the one hand, investments that are later withdrawn usually occur at the beginning of the offering, which may be justified by the intention to influence later investors. On the other hand, withdrawals occur more frequently in low-quality characteristics offerings and those with poor campaign dynamics, i.e., in those campaigns that may depend more on investors' signals to ensure success.

2.5.5. Investors' heterogeneity and behaviour

So far, we discuss the drivers of fundraising success related to the supply side of the ECF market (campaigns), such as the signals of the quality of projects and entrepreneurs, the information disclosure, the non-financial rewards, and the dynamics of the investment process. However, the ECF literature also begins to look at crowdinvestors-related factors, like investor heterogeneity, investor biases and the relevance of constructing trust relations and offering risk options to crowdinvestors.

2.5.5.1. Investors' heterogeneity

As previous stated, ECF has several differences from traditional equity finance in entrepreneurship (VC/BA). Using a survey of 400 individuals from three European countries, [Daskalakis and Yue \(2017\)](#) found that the average profile of crowd investors is a young and highly educated male. Their main motivations to invest are interest and excitement, followed by increased diversification, higher returns, and disappointment with traditional finance. By opposite, risk perceptions of a fraudulent funder, fraudulent platform and poor information are factors that discourage them from investing. Although these factors do not have the same importance in all the countries of the study (Germany, Poland, and Spain), in none of the countries the low expected return on investment is a factor that discourages investors from investing in ECF.

[Zafar, Waddingham, Zachary, and Short \(2021\)](#) find evidence that the information search behaviour of crowdfunders affects funding decision confidence. The search effort and search scope increase confidence in the funder's decision only up to a point, after which confidence declines. Equity crowdfunders are not like traditional equity investors who are primarily concerned with getting a return on their investment and suggest that entrepreneurs involved in crowdfunding should consider funder motivation and actively manage the information presented to potential crowdfunders.

Based on investment size, [Wallmeroth \(2019\)](#) identifies two groups of investors: (i) Large amount investors and (ii) crowd investors, showing that the crowd is not a homogenous community. Large investors, who are crucial for campaign success, are more utilitarian than expressive or emotional. They behave as professional investors, invest rather for financial objectives and are less likely to return for a second investment.

Another line of investigation, distinguish male from female investors. For instance, [Mohammadi and Shafi \(2018\)](#) argue that female investors are less likely to invest in younger and high-tech firms. Moreover, female investors are more likely to invest in projects in which the proportion of male investors is higher, which is probably related to the stereotypical view of women as incompetent investors, and because the gender-induced bias of women in male-dominated fields to favour the decisions of men as the dominant group.

In contrast to traditional funding markets, [Zhao et al. \(2021\)](#) found evidence that women entrepreneurs are more likely to be funded through ECF than their male counterparts. This result could be explained by the fact that, as ECF is characterized by high information asymmetry and uncertainty, trustworthiness is probably more important than the perceived competence of entrepreneurs in ECF, and women are viewed as more trustworthy than men ([Johnson et al., 2018](#)). Still, both lead investors and the firm's development stage moderate the relationship between female entrepreneurs and ECF success. As information asymmetry and uncertainty are reduced in the presence of a lead investor and later stages of firm development, the advantage of female entrepreneurs is lower.

[Hervé et al. \(2019\)](#) also document the predominance of male investors among crowd investors and find evidence that women invest less in riskier investments and make larger investments than men in less risky projects, which is more related to differences in risk aversion than differences in overconfidence. They also find evidence that crowd investors who live in more sociable areas (with more daily social interactions) tend to invest significantly more.

[Butticè et al. \(2021\)](#), using a novel technology (webcam-based remote eye tracking) in an experimental study with 515 participants in the ECF market, distinguish two groups of crowd investors based on their human capital: the investors with general human capital (i.e., higher

overall education levels and/or general entrepreneurial experience) and the investors with specific human capital (i.e., equity crowdfunding experience and/or industry-specific experience). Crowd investors with more general human capital use larger signal sets, take more time to form signal sets, and have a different signal set composition, while investors with specific human capital construct smaller signal sets, take less time to form signal sets, and have a different signal set composition.

[Feola, Vesci, Marinato, and Parente \(2021\)](#) suggest the existence of four distinct segments of investors in ECF (who have different motivations to invest): (i) venture trustful, (ii) crowdfunding technicians, (iii) financial investors, talent scouters (driven by confidence in team and confidence in the venture, and (iv) social dreamers.

[Goethner, Luettig, and Regner \(2021\)](#) categorize investors into three different types that differ in their motivations and investment strategies: crowd enthusiasts (sizable group of funders motivated by pro-social/ community factors); sophisticated investors (small group of very active and experienced investors) and casual investors (majority of funders, mostly concerned about monetary returns). ECF funders are not exclusively motivated by financial returns but also by pro-social or community motives.

From a different perspective, [Grüner and Siemroth \(2019\)](#) develop a theoretical model that links consumer preferences with investors' wealth and investment decisions in ECF. This model is mainly applicable to crowdfunding campaigns where firms primarily seek funding to expand production and meet demand, explaining why investment decisions are affected by the personal consumption preferences of investors for the products that start-ups will produce. According to the model, if all consumers are sufficiently liquid to invest, it is possible to get a Pareto efficient capital allocation and equity crowdfunding can resolve the demand uncertainty at the funding stage. However, if some consumer groups are liquidity constrained, the crowd investments will reflect the preferences of just some consumer segments (not all consumers), and a Pareto efficient capital allocation cannot generally be achieved. Thus, depending on consumers' access to liquidity, as some consumer groups are unable to invest but still consume, capital can be misallocated.

2.5.5.2. Investors' biases

More recently, the literature on ECF has explored the behavioural biases of crowd investors, such as the hypothetical bias ([D. Cumming et al., 2020](#)), gender bias ([Malaga et al., 2018](#)), home bias ([Chen et al., 2016](#); [Niemand, Angerer, Thies, Kraus, & Hebenstreit, 2018](#); [Zhang et al., 2019](#)) and crowd bias ([Stevenson, Ciuchta, Letwin, Dinger, & Vancouver, 2019](#)). Others also investigate the investors' behaviours biases in the presence of competing offerings, namely the herding behaviour, the choice avoidance, and 1/n heuristics ([Ferretti, Venturelli, & Pedrazzoli, 2021](#)), as well as the effect of moods and emotions on crowd investors' funding decisions ([Shafi & Mohammadi, 2020](#)).

[D. Cumming et al. \(2020\)](#) find evidence that many investors that participate in the pre-investment phase of ECF campaigns withdraw their investment intention when a campaign is started, suggesting that investors suffer from hypothetical bias. This bias refers to the fact that individuals make different decisions in a hypothetical situation than in a real one, leading individuals to withdraw from earlier commitments.

In the context of ECF, there is also some empirical research on gender differences, in terms of the presence of women among the founders and investors, as well as the investment preferences of females in comparison to male investors.

As among the traditional equity investors, studies on ECF report the presence of gender bias, given that a high percentage of entrepreneurs are male ([Cholakova & Clarysse, 2015](#); [Piva & Rossi-Lamastra, 2018](#); [Vismara, 2016](#)) and the predominance of male investors ([Hervé et al., 2019](#); [Mohammadi & Shafi, 2018](#)).

Additionally, some authors use gender (female) as a control variable in assessing the determinants of funding success in ECF. In general, the results consistently advocate that female founders do not differ in terms of their ability to attract investors ([Piva & Rossi-Lamastra, 2018](#); [Vismara, 2016](#)). The irrelevance of gender in funding decisions is confirmed by [Cholakova and Clarysse \(2015\)](#) in quasi-experiment research in Netherland (in a survey of all registered investors on the largest platform in the Netherlands (Symbid)). However,

[Vismara \(2016\)](#) reported that even so, female founders raised less money, suggesting the need for further investigation on the relevance of gender in ECF.

From a different perspective, [Mohammadi and Shafi \(2018\)](#) use a sample of all investors in 31 campaigns in the largest crowdfunding in Sweden (FundedByMe) to analyse the risk-averse attitudes of female investors. Consistently with the hypothesis of higher risk aversion of female investors, they find that the female investors seem to prefer to invest in older firms and are less likely to invest in technology firms and firms with a higher equity offering. Similarly, [Hervé et al. \(2019\)](#) find evidence that women invest less in riskier investments and make larger investments than men in less risky projects, which is more related to differences in risk aversion than differences in overconfidence.

Others argue that ECF participants prefer projects located in their home country (home bias) and avoid foreign currency (fear of foreign assets) ([Niemand et al., 2018](#)). [Bade and Walther \(2021\)](#) document the existence of local preferences in equity-based crowdfunding, especially in young ventures, with greater information asymmetries. The author argues that these findings are consistent with the limited capacity of investors to process information, who need to allocate their scarce attention resources to selected campaigns, leading to a higher probability of investors investing in local ventures. Similarly, [Giudici, Guerini, and Rossi-Lamastra \(2020\)](#) find that geographical proximity and age similarity are relevant in the ECF market. An investor is more likely to finance a campaign from start-ups whose board members are of similar age and reside in neighbouring cities. However, they do not evidence that the gender of board members is relevant to investors' decisions.

[Shafi \(2021\)](#) argues that non-professional crowdfunding investors may not process all available information about projects and entrepreneurs. Instead, they use some heuristics that reduce decision-making costs while preserving satisfactory levels of decision accuracy. Thus, the factors that most influence the investment decisions of crowdfunding investors are the attributes of the product or service (the most salient characteristics of the business and that are easier to assess), followed by the founders' motivation and commitment. In contrast, as financial information is difficult to evaluate, crowdinvestors pay little attention to the financial metrics contained in campaign descriptions.

[Stevenson et al. \(2019\)](#) find evidence that ECF funders with high self-efficacy (own beliefs in their ability to succeed in a defined task) show greater “crowd bias” (individual's tendency to follow the crowd opinions despite the presence of contrary objective quality indicators), and that is negatively related to the funder's decision-making performance. Using an experimental study, they found that amateur funders with high self-efficacy reveal lower search efforts and are less likely to recognize and react to negative pitch cues, leading them to invest nearly three times as much in a poor-quality venture, when compared with a knowledge group.

[Ferretti et al. \(2021\)](#) explore the behaviour of crowd investors in the presence of competing offerings. He classifies the investors of the Italian ECF market into four groups: early investors, late investors, selectors, and serial investors. Early and late investors are those who are less familiar with online investing and invest less frequently, while selectors and serial investors are small groups of active investors who invest more frequently. He also explores how each investor group is exposed to three heuristics: (i) herding behaviour (in the presence of information asymmetry the investors tendentially follow the decisions of other backers), choice avoidance (when the investor does not make a final decision but chooses to wait or possibly revisit his/her decision in the future), and (iii) 1/n heuristic (crowd investors may be affected by a diversification heuristic in the simultaneous choice condition, diversifying the available funds over the n campaigns published during the period, without a rational investment strategy). He found that the number of competing offerings available on the platform influences the amount invested and, in a less expressive way, the investment decision, while the exposure to heuristics varies among investors' profiles. Early and late investors are subject to herding behaviour in the presence of competing offerings, and selectors and serial investors are those groups with lower exposure to heuristics.

Finally, [Shafi and Mohammadi \(2020\)](#) explore the effect of moods and emotions on crowd investors' funding decisions. Using cloud cover as a proxy for mood (as it serves as a powerful mood stimulus), finds that sky changing in cloud cover from zero to full reduces investor contribution amounts, yet this negative effect is less pronounced in experiment investors and less risky campaigns (growth stage over early-stage ventures and campaigns using venture loan instead of equity).

2.5.5.3. Trust

As in other social and economic interactions that involve uncertainty and dependence, trust is important in the context of crowdfunding ([Kang, Gao, Wang, & Zheng, 2016](#)). Based on the concept that trust exists “when one party has confidence in an exchange partner’s reliability and integrity” ([Morgan & Hunt, 1994](#)), [Kang et al. \(2016\)](#) analyse the influence of two dimensions of trust (cognitive/calculus trust - “trust from the head” - and affective/relationship trust - “trust from the heart”) on the willingness of investors to invest in ECF campaigns. They find evidence that the driving forces of calculus and relationship trust are the network externality, perceived informativeness, perceived accreditation, structural assurance, third-party seal, value congruence and social interaction ties and that both calculus and relationship trust influence moderates the willingness of investors to invest in ECF campaigns.

Similarly, [Alharbey and Hemmen \(2021\)](#) argue that investors’ intentions to invest in ECF are significantly influenced by both fundraiser and platform trust. Trust in the platform (by screening honest and competent entrepreneurs) influences the fundraiser's trust, reflecting the relevance of the fundraiser’s reliance on trusted institutions. Moreover, the delivery of high-quality information about their projects contributes to building investors’ trust. They find empirical evidence that investors’ intention to invest in ECF is positively influenced by familiarity with crowdfunding, disposition to trust and information about project quality positively impacts investors’ intention. In contrast, they do not find evidence that education signals affect investors’ intention to invest.

[Baber and Fanea-Ivanovici \(2021\)](#) also find that intention of investors to participate in ECF campaigns of creative and cultural projects (film and web series industry) is positively influenced by the perceived trust (in platform and fundraiser) and negatively influenced by the perceived risk of the projects. Inner innovativeness, economic value and financial projections of the project have a positive influence on the perceived trust, while equity share has a negative influence on the perceived risk (derived from the problem of equity dilution).

However, [Xiao \(2020\)](#) argues that, in the investor-led model on ECF, lead investors and follow-on investors differ in terms of the role of trust in the decision-making process.

Professional lead investors use both selective signalling information and physical interactions with the entrepreneurs to build competence and relational trust and make their investment decisions. Follow-on investors are influenced by the behaviour and reputation of a lead investor. To make their decisions, they observe the investments of lead investors of whom they have a positive perception. Then they seek out published information about those ventures and entrepreneurs, as well as the judgements of other investors (supposed wisdom of the crowd) to build their trust in making the final investment decision.

2.5.5.4. Risk-options

[Wasiuzzaman, Chong, and Ong \(2021\)](#) highlight the relevance of perceived risk factors in the decision-making process of ECF investors. Using a survey of 169 investors in ECF platforms in Malaysia, they found that investors are more willing to invest in projects with low investment risk and if they perceive the legal risk to be higher. Do not find evidence that technology risk has a significant influence on the decision to support equity crowdfunding ventures. However, these results may not be replicable in other countries, given that as in Malaysia many of the ECF investors are BA, they can see the regulatory framework as negative because it imposes additional difficulties on the investment and is not a way to protect them.

Finally, [Angerer, Thies, Niemand, and Kraus \(2018\)](#) suggest that investment decisions of crowd investors are influenced by the use of risk-reduction options, such as the option of crowd or individual-voting, option to decide if some of the invested money is paid back to the investors a year after the ECF investment or option of bankruptcy insurance (insurance protection in case of bankruptcy for the term of five years). Using an experimental study with 210 potential investors from Germany, Switzerland, Austria, and Liechtenstein, the authors found that the introduction of risk-reducing options in ECF campaigns decreases the investments in less attractive projects, inducing investors to concentrate even more on the most attractive ones. This way, the introduction of risk-reducing options penalizes entrepreneurs who offer riskier investment opportunities, discouraging them to enter the market.

Although there is already diverse literature on investor heterogeneity (as we can see in ***Table 10 Table 10 - Summary of literature about drivers of fundraising success in ECF related to investors' heterogeneity and behaviour***), it is still very disintegrated, so future research could benefit from the attempt to integrate the different perspectives analysed by previous literature.

Table 10 - Summary of literature about drivers of fundraising success in ECF related to investors' heterogeneity and behaviour

Paper	Research Design	Data (sample)	Main results/conclusions
Kang et al. (2016)	Empirical (quantitative)	487 respondents of a survey - individuals with investment experience on ECF (China, 2015)	Based on trust theory, there is evidence of the mediating effect of calculus trust and relationship trust on the willingness of investors to invest in ECF campaigns.
Angerer et al. (2018)	Empirical (quantitative)	Experimental study with 210 potential investors from Germany, Switzerland, Austria, and Liechtenstein	Investors tend to invest in the most attractive and least risky ECF projects. The introduction of risk-reducing options in ECF campaigns decreases the investments in less attractive projects, inducing investors to concentrate even more on the most attractive projects, and discouraging entrepreneurs who offer riskier investment opportunities from entering the market.
Daskalakis and Yue (2018)	Empirical (quantitative)	400 respondents of a survey who are familiar with crowdfunding in each country (Germany, Poland, and Spain)	ECF investors are different from traditional investors in terms of gender, age, and education. The average profile of ECF investors is a young and highly educated male. The top motivations for ECF investors are “interest and excitement”, followed by increased diversification, higher returns, and disappointment with traditional finance. On contrary, risk perceptions of fraudulent raisers, fraudulent platforms, and poor information discourage people to invest in ECF markets. While these factors are different among the three countries of the study (Germany, Poland, and Spain), poor returns do not seem to be a factor that discourages people to invest in any country.
Mohammadi and Shafi (2018)	Empirical (quantitative)	31 campaigns from FundedByMe (Sweden, 2012-2015)	Female investors are less likely to invest in younger and high-tech firms and more likely to invest in projects in which the proportion of male investors is higher.
Niemand et al. (2018)	Empirical (quantitative)	217 experiment participants from Switzerland, Liechtenstein, Germany, Austria	ECF participants prefer projects located in their home country and avoid foreign currency investments. These results reflect a home bias (irrational behaviour of investors) and a fear of foreign assets, in addition, to avoiding additional transaction costs related to currency conversion. However, the payment methods seem to have no significant influence on decision-making. The main reason for the identified home bias in ECF is related to legal regulations.
Grüner and Siemroth (2019)	Theoretical model	-	A theoretical model that links consumer preferences with investors' wealth and investment decisions in ECF. If all consumers are sufficiently liquid to invest, it is possible to get a Pareto efficient capital allocation and the ECF can resolve the demand uncertainty at the funding stage. However, if some consumer groups are liquidity constrained, the crowd investments will reflect the preferences of just some consumer segments, and a Pareto efficient capital allocation cannot be achieved.

Paper	Research Design	Data (sample)	Main results/conclusions
Hervé et al. (2019)	Empirical (quantitative)	97 campaigns (10142 Investment decisions) from WiSEED (France, 2009-2015)	Evidence that crowd investors who live in more sociable areas (with more daily social interactions) tend to invest significantly more. They also document the predominance of male investors among crowd investors and find evidence that women invest less in riskier investments and make larger investments than men in less risky projects, which is more related to differences in risk aversion than differences in overconfidence.
Stevenson et al. (2019)	Empirical (quantitative)	Study I: 163 business school students; Study II: 76 students; Study III: 285 participants using Amazon's Mechanical Turk (USA)	Find evidence that ECF funders with high self-efficacy show greater “crowd bias” (an individual's tendency to follow the crowd opinions despite the presence of contrary objective quality indicators), and that is negatively related to the funder's decision-making performance. Using an experimental study, they found that amateur funders with high self-efficacy reveal lower search efforts and are less likely to recognize and react to negative pitch cues, leading them to invest nearly three times as much in a poor-quality venture, when compared with a knowledge group.
Wallmeroth (2019)	Empirical (quantitative)	42,997 investments of 15,419 investors from 59 campaigns in Companisto (Germany, 2012-2016)	Based on investment size, the authors identify two groups of investors: (i) Large investors and (ii) crowd investors, showing that the crowd is not a homogenous community. Large investors, who are crucial for campaign success, are more utilitarian than expressive or emotional. They behave as professional investors, invest rather for financial objectives and are less likely to return for a second investment.
Giudici et al. (2020)	Empirical (quantitative)	361 investors and the 13 start-ups (4,693 investor–investee dyads) (Italy, 2013-2016)	Geographical proximity and age similarity are relevant in the ECF market. An investor is more likely to finance a campaign of a start-up whose board members are of similar age and reside in neighbouring cities. However, the gender of board members is not relevant to investors' decisions.
Shafi and Mohammadi (2020)	Empirical (quantitative)	102 campaigns, receiving 67,982 pledges from Companisto (Germany, 2012-2019)	Explores the effect of moods and emotions on crowd investors' funding decisions. Using cloud cover as a proxy for mood finds that sky changing in cloud cover from zero to full reduces investor contribution amounts, yet this negative effect is less pronounced in experiment investors and less risky campaigns.
Xiao (2020)	Empirical (qualitative)	189 campaigns, 25 face-to-face interviews with platform managers, investors, and entrepreneurs (China, 2013-2016)	In the investor-led model of ECF, lead investors and follow-on investors differ in terms of the role of trust in the decision-making process. Professional lead investors use both selective signalling information and physical interactions with the entrepreneurs to build competence and relational trust and make their investment decisions. Follow-on investors are influenced by the behaviour and reputation of the lead investor.
Alharbey and Van Hemmen (2021)	Empirical (quantitative)	216 users (potential investors) of Manafa (Saudi Arabia, 2019)	The investor's intentions to invest in ECF are significantly influenced by both fundraiser and platform trust. Trust in the platform influence fundraiser's trust, reflecting the relevance of the fundraiser's reliance on trusted institutions. Moreover, the delivery of high-quality information about their projects contributes to building investors' trust. Empirical evidence that investors' intention to invest in ECF is positively influenced by familiarity with crowdfunding, disposition to trust and information about project quality. In contrast, do not find evidence that education signals affect investors' intention.

Paper	Research Design	Data (sample)	Main results/conclusions
Baber and Fanea-Ivanovici (2021)	Empirical (quantitative)	432 potential investors from Asia and Europe	Participation intention of investors in ECF campaigns of creative and cultural projects (film and web series industry) is positively influenced by the perceived trust (in platform and fundraiser) and negatively influenced by the perceived risk of the projects. Inner innovativeness, economic value and financial projections of the project have a positive influence on the perceived trust, while equity share has a negative influence on the perceived risk (derived from the problem of equity dilution).
Bade and Walther (2021)	Empirical (quantitative)	63,691 investments in 93 campaigns from Companisto (Germany, 2012-2019)	Evidence of the existence of local preferences in equity-based crowdfunding, especially in young ventures, with greater information asymmetries. These findings are consistent with the limited capacity of investors to process information, who need to allocate their scarce attention resources to selected campaigns, leading to a higher probability of investors investing in local ventures.
Butticè et al. (2021)	Empirical (quantitative)	Experimental study with 515 participants in the ECF market	The interpretation of ECF campaign signals depends on the human capital of crowd investors. Two groups of crowd investors are identified: the investors with general human capital and the investors with specific human capital. Crowd investors with more general human capital use a larger signal set, take more time to form signal sets, and have a different signal set composition, while investors with specific human capital construct smaller signal sets, take less time to form signal sets, and have a different signal set composition.
Feola et al. (2021)	Empirical (quantitative)	Survey of 60 investors in ECF in Italy	Suggest the existence of four distinct segments of investors in ECF according to their investment motivations: (i) venture trustful, (ii) crowdfunding technicians, (iii) financial investors, talent scouters (driven by confidence in team and confidence in the venture, and (iv) social dreamers.
Ferretti et al. (2021)	Empirical (quantitative)	2,592 investors of 50 ECF (Italy, 2016 – 2018)	Explores the crowd investor behaviour in the presence of competing offerings. Considering the existence of four groups of investors (early investors, late investors, selectors, and serial investors), he found that (i) the number of competing offerings available on the platform influences the investors' behaviour, with consequences for the amount invested and the investment decision, and that (ii) exposure to heuristics (herding, choice avoidance and 1/n heuristics) varies among investors' profiles.
Goethner et al. (2021)	Empirical (quantitative)	16,666 investments made by 7474 funders in 28 campaigns listed on Companisto (Germany, 2012-2014)	They categorise investors into three different types based on their investment motivations and strategies: crowd enthusiasts (sizable group of funders motivated by pro-social/ community factors); sophisticated investors (small group of very active and experienced investors) and casual investors (majority of funders, mostly concerned about monetary returns). ECF funders are not exclusively motivated by financial returns but also by pro-social or community motives.
Shafi (2021)	Empirical (quantitative)	207 campaigns from Crowdcube (UK, 2015-2016)	Argue that non-professional crowdfunding investors may not process all available information about projects and entrepreneurs. Instead, they use some heuristics that reduce decision-making costs while preserving satisfactory levels of decision accuracy. Thus, the factors that most influence the investment decisions of crowdfunding investors are the attributes of the product or service, followed by the founders' motivation and commitment. In contrast, as financial information is difficult to evaluate, crowdinvestors pay little attention to the financial metrics contained in campaign descriptions.

Paper	Research Design	Data (sample)	Main results/conclusions
Shaista Wasiuzzaman et al. (2021)	Empirical (quantitative)	Survey of 169 investors in ECF platforms in Malaysia	Highlights the relevance of perceived risk factors in the decision-making process of ECF investors. The result suggests that investors are more willing to invest in projects with low investment risk and if they perceive the legal risk to be higher. Do not find evidence that technology risk has a significant influence on the decision to support equity crowdfunding ventures.
Zafar et al. (2021)	Empirical (quantitative)	Experimental study with 116 graduate students enrolled in a masters-level finance course (USA)	Evidence that information search behaviour of crowdfunders affects funding decision confidence. The search effort and search scope increase confidence in the funder's decision only up to a point, after which confidence declines. Equity crowdfunders are not like traditional equity investors who are primarily concerned with getting a return on their investment and suggest that entrepreneurs involved in crowdfunding should consider funder motivation and actively manage the information presented to potential crowdfunders.
Zhao et al. (2021)	Empirical (quantitative)	259 campaigns from three platforms in China (2014-2019)	In contrast to traditional funding markets, it is found evidence that women entrepreneurs are more likely to be funded through ECF than their male counterparts. This result could be explained by the fact that, as ECF is characterized by high information asymmetry and uncertainty, trustworthiness is probably more important than the perceived competence of entrepreneurs in ECF, and women are viewed as more trustworthy than men (Johnson et al., 2018). Yet, both lead investors and the firm's development stage moderate the relationship between female entrepreneurs and ECF success.

2.5.6. Country-level characteristics

Empirical research on the drivers of fundraising success of ECF campaigns is mainly focused on factors related to venture and team characteristics, as well as the dynamics of the investment process. However, a few papers also assess the impact of country-level characteristics on ECF market development and investment decisions.

[Kshetri \(2018\)](#), using an inductive analysis of a set of numerous and diverse documents (articles, blogs, reports, policy documents, video and audio clips, and archival data), develops a theory for explaining the relationship between informal institutions and ECF. According to the author, informal institutions are critical to the development of the ECF industry. The entrepreneurs' willingness to raise funds via ECF platforms decreases with the degree of stigmatization of entrepreneurial failure in society because ECF-funded businesses are more visible and more likely to be noticed. The propensity of individuals to invest in ECF is positively related to the degree of trust between strangers and online transactions. Furthermore, a country characterized by a lower degree of philanthropic involvement is likely to exhibit a higher relative preference for ECF over other crowdfunding models.

[Di Pietro and Buttice \(2020\)](#) use data from crowdfunding markets in 27 countries to examine how the development of the crowdfunding market is influenced by formal and informal institutional country-level characteristics. Formal institutions include the rank ease of doing business, protecting minorities, starting business procedures, enforcing contracts and market capitalization. Informal institutions include the six dimensions of [Hofstede \(1991\)](#) national culture measures (Uncertainty Avoidance, Individualism, Power Distance, Long Term Orientation, Indulgence and Masculinity). They found that both formal and informal institutional country-level characteristics have a positive and significant impact on the level of crowdfunding activity. ECF is more popular in countries with a stronger long-term orientation, with less bureaucracy, shorter time and lower costs related to establishing a business.

Finally, [Battaglia, Carboni, Cicchiello, and Monferrà \(2021\)](#), using data from 492 ECF campaigns from three countries in South America (Brazil, Chile, and Mexico), analyse the impact of corruption rules on ECF fundraising success. They found empirical evidence that,

in countries characterised by a low level of investor protection and a high perception of the corruption environment, the anti-corruption rules have a positive and significant influence on ECF investments.

Given the scarce literature related to the influence of country-level characteristics on the outcomes of ECF campaigns, this topic should be explored in future research.

In **Table 11** there is a summary of the literature about the drivers of fundraising success related to country-level characteristics.

Table 11 - Summary of literature about drivers of fundraising success in ECF related to country-level characteristics

Paper	Research Design	Data (sample)	Main results/conclusions
Kshetri (2018)	Conceptual	Inductive analysis of articles, blogs, reports, policy documents, video and audio clips, and archival data	Informal institutions are key to the development of the ECF industry. Compared to other financing sources, entrepreneurs' willingness to raise funds via ECF platforms decreases with the degree of stigmatization of entrepreneurial failure in society (because ECF-funded businesses are more visible and more likely to be noticed) and increases with the existence of crowdfunding-related trade associations. The propensity of individuals to invest in ECF is positively related to the degree of trust between strangers and degrees of trust in online transactions. A country characterized by a lower degree of philanthropic involvement is likely to exhibit a higher relative preference for ECF than other crowdfunding models.
Di Pietro and Buttice (2020)	Empirical (quantitative)	Data on 27 different crowdfunding markets (2014–2017)	Both formal and informal institutional country-level characteristics have a positive and significant impact on the level of crowdfunding activity, across the different crowdfunding models (reward, equity, and donation). The size of the crowdfunding market is larger in countries characterized by a business-friendly legal environment and a well-developed financial market. Compared to collectivistic societies, individualistic societies are more open to using all crowdfunding models. ECF is more popular in countries with a stronger long-term orientation, with less bureaucracy, shorter time and lower costs related to establishing a business.
Battaglia, Carboni, et al. (2021)	Empirical (quantitative)	492 ECF campaigns in Brazil, Chile, and Mexico (2013-2017)	Empirical evidence of the positive influence of anti-corruption rules on ECF investments in countries characterised by a low level of investor protection and a high perception of corruption environment.

2.6. Post-campaign outcomes

Our last section reviews the empirical literature about the post-investment outcomes of firms involved in ECF campaigns, related to firms' failure rates, subsequent financing rounds and firm performance of equity-crowdfunded firms. **Table 12** shows a summary of literature about the post-campaign outcomes in ECF.

2.6.1. Failure rates

Only a few papers have analysed the bankruptcy (failure rates) among firms listed on equity crowdfunding platforms. The existing empirical evidence shows that between 16% and 18% of firms fail a few years after the ECF campaigns ([Hornuf, Schmitt, & Stenzhorn, 2018](#); [Signori & Vismara, 2018](#); [Walthoff-Borm, Vanacker, et al., 2018](#)).

[Signori and Vismara \(2018\)](#) using a sample of 212 firms that were successfully funded on the Crowdcube platform between 2011 and 2015 found that, at the end of April 2017, 17.9% of those firms failed. The authors argue that this is a low percentage compared with the 56% failure rate reported for BA investments in the United Kingdom ([Wiltbank, 2009](#)).

[Hornuf et al. \(2018\)](#) investigate whether the characteristics of ECF campaigns determine the likelihood of failure of start-ups. Their sample includes 413 firms successfully funded by ECF in Germany and the UK, between 2011 and 2016 (270 from UK portals and 143 from German portals). Overall, 16,7% of firms failed¹⁷ until May 2018. The German firms have a higher likelihood of failure than the UK firms - the chance of firm survival, after 3 years, is 90% for UK firms and 70% for German firms. They suggest that this result is probably due to the different financial instruments used or governance issues of the platforms (in German have used mezzanine financial instruments without any control rights for investors).

[Walthoff-Borm, Vanacker, et al. \(2018\)](#) compare crowdfunded firms with non-crowdfunded firms using two matched samples. The first sample includes 205 successfully equity

¹⁷ Firms that are insolvent, liquidated or dissolved.

crowdfunded firms on Crowdcube and Seedrs between 2012 and 2015, and the matched sample includes non-crowdfunded firms. Both groups are similar in terms of industry classification, firm size, firm age, and intangible assets ratio. They found that, contrary to their expectations, failure rates are higher for crowdfunded firms (equity crowdfunded firms have 8.5 times higher failure rates than matched non-crowdfunded firms), suggesting that the “wisdom of the crowd” doesn’t overcome the adverse selection issues. ECF firms seem to have a higher likelihood to fail than non-crowdfunded firms, but they also show better innovative performance (higher patenting activity), suggesting that their higher failure rates could be associated with their higher risks. Others argue that the use of open innovation platforms is related to the later success of start-ups, and those that explore crowd network ties are more likely to be successful later in terms of survival rates and fundraising achievements ([Di Pietro et al., 2018](#)).

While, most of the empirical research on failure rate in the ECF context use samples that only include successful crowdfunded firms, from the literature review we only identify one paper that compares post-campaign outcomes of firms equity crowdfunded firms with those firms that failed the ECF campaigns ([Cho, Park, & Sung, 2019](#)). Using a sample of 228 ECF campaigns projects from 218 companies (111 successes and 117 failures) in South Korea, the authors do find that the survival rate of successful firms in ECF (86,5%) is higher than for firms with failed ECF campaigns (82,9%), but the difference between the two groups is not significantly different.

Previous research also analyses the factors that influence the bankruptcy of ECF firms. Empirical evidence shows that firms with a track record of positive sales ([Cumming, Meoli, et al., 2019](#); [Signori & Vismara, 2018](#)), without voting shares ([Signori & Vismara, 2018](#)), with quick success in the ECF campaign ([Signori & Vismara, 2018](#)), with a higher number of the senior management team and a lower firm valuation ([Hornuf et al., 2018](#)) are less likely to fail. For instance, consistently with the argument that qualified investors to have the ability to select the most promising projects, [Signori and Vismara \(2018\)](#) find that, in their sample, none of the firms initially backed by qualified investors failed.

[Coakley, Lazos, and Liñares-Zegarra \(2022\)](#) suggest that founder teams outperform solo ventures in equity crowdfunding. Founder teams are more probable to conduct successful

ECF campaigns than solo ventures and are less likely to fail thereafter. The quality of human capital of founder teams attracts professional investors. During the campaign, these professional investors act as a certification effect. After the campaign, the monitoring role of these investors reduces moral hazard concerns and the likelihood of failure for ECF founder teams.

However, empirical research does not find evidence that the existence of patents or trademarks and the presence of non-executive directors significantly influence the likelihood of failure rate for ECF firms ([Cumming, Meoli, et al., 2019](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)).

Other papers focus their analysis on the relationship between the rights of crowd investors and the failure rate of firms. [Cumming, Meoli, et al. \(2019\)](#), using a sample of 491 ECF campaigns in Crowdcube between 2011 and 2016, find that a high separation between ownership and control increases the likelihood of firm failure. [Hornuf, Schilling, and Schvienbacher \(2021\)](#), focusing on the German market where crowd investors do not receive common shares, but the regulatory environment allows wide contractual freedom, find that ECF contracts are similar to VC contracts, as they include the same covenants and tend to separate cash flow rights from control rights. Entrepreneurs demand a higher price to provide cash flow and exit rights, but there is no evidence that cash flow and control rights significantly influence the outcomes of the campaign, which could be driven by the fact that crowdinvestors may not be able to exercise their rights given the relatively high transaction costs. They also find that cash flow and control rights do not influence insolvency likelihood in a significant way, but exit rights increase the failure rate. This evidence is interpreted by the authors as a way for investors with exit rights to avoid inefficient cash expenditures by the entrepreneur, triggering insolvency more quickly.

[Jo and Yang \(2020\)](#) compare the financial forecasts provided in ECF campaigns with ex-post realizations of a sample of equity crowdfunded firms in Crowdcube. They conclude that financial forecasts are of poor quality and optimistically biased. They also find evidence that firm survival is not influenced by forecasted sales and lack of dividends, but firms that forecast the need for subsequent equity financing and predict the payback of pre-campaign

debt are more likely to fail (not survive) in the future. Firms with problematic forecasts also show a higher probability of failure in future.

[Reichenbach and Walther \(2021\)](#) investigate whether signals that increase crowd participation in ECF campaigns are also associated with a higher likelihood of post-campaign survival. The authors find that the probability of firm failure decreases when the CEO holds a university degree and when the equity offered is higher. The number of updates does not significantly influence the post-campaign risk of failure, but when they categorize updates, find that updates on business-related information are a positive signal, while updates on external certification, promotions and teams act as negative signals that increase the likelihood of failure. Contrary to previous research, do not find evidence that large investments and reputable investors influence the failure rate of ECF firms.

However, empirical research on the failure rate of ECF firms has some limitations. As some authors recognize some caution is needed in interpreting the results on failure rates, given the short time window between the initial offering and the post-offering outcomes ([Signori & Vismara, 2018](#)). Additionally, most of the paper analyses only successfully funded initial equity offerings, excluding firms with failed campaigns ([Hornuf et al., 2018](#); [Signori & Vismara, 2018](#); [Walthoff-Born, Vanacker, et al., 2018](#))¹⁸. There is also some inconsistency in the empirical evidence about the influence of some variables on firm failures, such as target capital and firm age. While some find a significant negative effect ([Cumming, Meoli, et al., 2019](#)), others conclude by their irrelevance ([Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)). This way, further investigation on this topic is needed.

2.6.2. Follow-on funding

Another avenue of research on the post-campaign outcomes is the follow-on funding of ECF firms. As for failure rates, the empirical evidence on follow-on funding is still limited to a small number of papers, which main conclusions are summarised below.

¹⁸ In some papers, although the full sample includes both firms with successful and unsuccessful campaigns, the analysis of the failure rate is done only for successful ones ([Cumming, Meoli, et al., 2019](#)).

[Signori and Vismara \(2018\)](#) find that among the 212 funded offerings on Crowdcube, between 2011 and 2015, a significant proportion of them (35%) raised further capital until the end of April 2017 (between 2 and 6 years after the initial ECF campaign), conducting seasoned equity offerings (SEOs), in the form of follow-on crowdfunding offering, or private equity injection from BA/VC. Only 3 firms were acquired in the same period and 46% of the firms were still active but were not involved in any post-offering event.

There is a group of studies in the literature that analyse the factors that influence the probability of raising additional capital after the ECF campaign, either through VC or BA ([Cumming, Meoli, et al., 2019](#)); [Hornuf et al., 2021](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)) or via seasoned equity crowdfunded offerings (SECO) ([Coakley et al., 2021](#)). Those factors are related to firms' and teams' characteristics, as well as the conditions and results of ECF campaigns.

[Signori and Vismara \(2018\)](#) find that firms with patents and positive sales before the ECF campaign have a higher likelihood of pursuing an SEO or M&A after the campaign. While this evidence is confirmed by [Cumming, Meoli, et al. \(2019\)](#) for prior sales, others do not find evidence that patents and trademarks significantly influence subsequent funding ([Cumming, Meoli, et al., 2019](#); [Hornuf et al., 2018](#)). A possible explanation stated by [Hornuf et al. \(2018\)](#) is that the variable number of patents does not take into account the quality of those patents. Empirical research does not find evidence that the probability of getting follow-on funding is significantly influenced by other characteristics of firms, such as industry diversification ([Signori & Vismara, 2018](#)), family firm ([Cumming, Meoli, et al., 2019](#)) firms located in a big city or by the number of employees ([Hornuf et al., 2018](#)).

The team's characteristics of ECF firms can also influence follow-on funding. The presence of non-executive directors ([Cumming, Meoli, et al., 2019](#); [Signori & Vismara, 2018](#)) and a higher number of senior managers ([Hornuf et al., 2018](#)) increase the likelihood of getting follow-on funding. However, contrary to the expectations of [Hornuf et al. \(2018\)](#), an increase in the average age of the senior management team decreases the probability of firms obtaining follow-on funding. For the authors, a likely explanation is related to the fact that young managers might be close to trending markets and generate higher growth rates in the future. The existing empirical studies do not find evidence that other characteristics of the

management team influence the ability of firms to get additional funding after the ECF, such as the share of females in the management team ([Hornuf et al., 2018](#)), previous founder work experience ([Cumming, Meoli, et al., 2019](#)) or entrepreneurial experience of the team ([Hornuf et al., 2021](#)).

The intensity of investor participation in the initial crowdfunding campaign is also relevant for follow-on funding by BA/VC. Firms with a low number of crowd investors and with quick success in the initial ECF campaign are more likely to get a successful outcome in terms of follow-on funding ([Signori & Vismara, 2018](#)). This evidence is consistent with the reduced monitoring effect ([Brennan & Franks, 1997](#)) which predicts that a greater dispersion of outside investors weakens their incentive to effectively monitor the firm's managers. Additionally, venture capitalists are less interested in financing crowdfunded firms with a high dispersion of ownership because it increases the complexity of future governance ([Drover, Wood, & Zacharakis, 2017](#); [Moedl, 2021](#)). However, the effect of crowd participation is not supported in other papers, where the variable number of ECF investors is statistically insignificant for follow-up funding by outside BA/VC ([Hornuf et al., 2018](#)).

We also find mixed results about the relevance of the presence of qualified investors in ECF campaigns for follow-on funding from VC/BA. [Signori and Vismara \(2018\)](#) do not find evidence that the initial participation of qualified investors is a significant predictor of subsequent SEOs or M&As. However, [Hornuf et al. \(2018\)](#) analyse separately the relevance of initial VC and initial BA. They find that firms with a higher number of initial venture capital investors are more likely to obtain follow-on funding, but the number of initial BAs investors is irrelevant.

[Coakley et al. \(2021\)](#) use a sample of 709 successful initial ECF and 105 first follow-on campaigns, listed in Crowdcube, Seedrs and SyndicateRoom platforms between April 2011 and December 2018, to analyse the determinants of successful follow-on ECF campaigns. They suggest that Seasoned Equity Crowdfunded Offerings (SECO) face fewer information asymmetries than initial ECF campaigns, reducing adverse selection problems, and find that the probability of conducting a SECO is positively associated with the pre-money valuation gains, the number of investors and negatively influenced by the equity offered in the initial campaign. It also depends on the shareholder's structure model used by the platform.

Follow-on campaigns are more likely to occur in platforms that have a lead investor approach and on platforms that act as a nominee shareholder than in platforms with a direct shareholder's structure. This result suggests that nominee structure and co-investment models have monitoring instruments that can reduce potential moral hazard problems.

This way, more recently, some papers have focused the analysis on how the shareholder's structures and crowdinvestors rights influence the attraction of VC/BA investors after the ECF campaign ([Butticè et al., 2020](#); [Cumming, Meoli, et al., 2019](#); [Hornuf et al., 2021](#))

[Cumming, Meoli, et al. \(2019\)](#) investigate whether the implementation of a threshold to get voting rights in the ECF campaign affects the long-term success of the firm, measured by the firm's ability to raise further financing or to deliver an exit opportunity through IPO or M&A. They report that the likelihood of long-term success is negatively influenced by the high separation between ownership and control and firm age, and it is positively influenced by the cash flow rights of controlling shareholders (equity retained), the existence of positive sales before the offering and the presence of non-executive directors.

[Butticè et al. \(2020\)](#) highlight the importance of the shareholder structure as a screening mechanism for VC investors. They compared firms successfully funded in ECF with two control samples: a group of firms that did not receive any external seed financing and another group of angel-backed firms. They find that, compared to firms that have not received any seed financing, equity crowdfunded firms are more likely to receive subsequent VC funding. This effect is more pronounced for firms financed by the ECF using a nominee shareholder structure (rather than a direct shareholder structure). Furthermore, receiving ECF through a nominee shareholder structure also positively affects the attraction of subsequent VC financing, compared to firms backed by BA.

[Hornuf et al. \(2021\)](#) find no evidence that cash flow and control rights of ECF contracts significantly influence the likelihood of receiving follow-on funding by professional investors in Germany. Exits rights are significant at the 10% level. The pre-money valuation (control variable) is positively associated with follow-on funding, suggesting that the more promising and more developed firms, that need a larger amount of funding (closer to the levels that VCs usually invest), are the most attractive to professional investors.

From a different perspective, [O' Reilly, Mac an Bhaird, and Cassells \(2021\)](#) highlight the relevance of liquidity for early-stage firms in the cleantech sector in Europe, before, during and after ECF campaigns. Before the ECF campaign, firms raise more equity if they have more intangible and illiquid assets and raise more debt if they have larger tangible assets. Firms raise more money in ECF campaigns when they have already raised financing before the campaign, and have lower total assets and higher cash balances. According to signalling theory, successful ECF campaigns have a positive impact on the ability to raise external financing post-campaign. They also find that firms that raised debt financing before the ECF campaign are more likely to raise debt and equity funding after the campaign.

While much of the literature about follow-on funding uses observational studies and samples of crowdfunded firms, some papers also use different approaches (such as experiments and interviews) to assess the probability of the start-up receiving follow-on investment from venture capitalists.

[Drover, Wood, et al. \(2017\)](#) use a conjoint analysis decision-making experiment with 104 VCs in the United States throughout two online experiments, one investigating the influence of angel attributes and the other on crowdfunding characteristics. In the crowd experiment, they evaluate how (i) the platform reputation (site track record - reputation of platforms for producing successful ventures, i.e., start-ups that go on to realize consistent profitability), (ii) the number of investors in the crowdfunding campaign (collective attribute) and (iii) the crowdfunding platform type (equity, reward, or lending) influence the later investors (VC investors). Overall, their results suggest that the willingness of VCs to conduct due diligence is significantly higher in platforms that have an established record of investment success, but the volume of investors had no meaningful certification effect. However, the interaction variable between site track record and crowdfunding investor volume is positive and statistically significant, suggesting that the certification effect of the crowd investors depends on the crowdfunding model used. While in the reward model, the number of investors in the crowdfunding campaign has a significant influence on VC decisions to conduct due diligence, in the lending and equity models such effect is not significant.

[Moedl \(2021\)](#) also use an experiment design (interview with 20 practising venture capital managers and business angels located in Germany and an online survey of 134 VC or BA investors) to examine the effects of contractual frictions on securities-based crowdfunding on subsequent venture capital financing rounds. From the qualitative analysis, they found several contractual clauses (related to ownership structure, voting and control rights, cash flow rights, valuation of the company, trade sales and distribution of exit returns or preferred dividends) in securities-based crowdfunding which might potentially be detrimental to subsequent venture investors' willingness to invest in a such-funded start-up. They find that the most problematic covenants of ECF contracts are: (i) no pooling (specification when crowd investors are not pooled in an investment vehicle but hold direct securities); (ii) right of termination (crowd investors can demand repayment of their investment within a reasonable cancellation period); (iii) upward dilution protection (in subsequent financing rounds, crowd investors retain their percentage shares in the company without having to inject new capital) and the non-existence of a drag-along clause (in case of a trade sale of shares of majority shareholders, crowd investors do not have the obligation to sell likewise).

[Brown, Mawson, and Rowe \(2019\)](#), through interviews with representatives of equity crowdfunded firms in the UK (from Crowdcube, Seedrs and Syndicate Room platforms), highlight the role of different networks during the crowdfunding process (before, during and after the ECF campaign). After campaigns, the focus of entrepreneurs is to deepen the business network ties. Their findings also corroborate that being successful in ECF is a quality signal that facilitates follow-on funding.

Finally, some authors suggest a funding trajectory according to the stage of the start-up. [Bessière et al. \(2020\)](#) use a case study of a French firm with a complex co-investment of three seed capital actors (ECF, BA, and VC) to propose a model of sequential and co-investment for follow-on funding, where each actor (ECF, BA and VC) play a significant role on each funding round. In the first stage, when the start-up moves from concept to project, the venture is financed by reward-based crowdfunding. This phase is crucial to signal the quality of both project and team management. In the second stage, the start-up moves to ECF via co-investments with BA and, in the third stage, is used BA and VC. In the last phase, VC assumes a leadership role, which is determinant to deal with governance issues related to the high dispersion of ownership structure. More the success of follow-on funding depends on

the consistency of the funding path. Contrary to [Moedl \(2021\)](#), the authors argue that ECF can be a positive signal for BA and VC when the ECF campaign is launched at a particular point of a consistent funding trajectory.

2.6.3. Firm performance

In addition to survival and follow-on funding, some papers also investigate the firm performance after an equity crowdfunding campaign, in terms of growth opportunities, profitability and innovative performance.

[Walthoff-Borm, Vanacker, et al. \(2018\)](#) compare the financial (profitability) and innovative performance (intangible assets ratio and patent data) of equity crowdfunded firms and non-crowdfunded firms. They document that both groups of firms accumulate significant losses over time and that the median firm profitability in post-campaigns is not significantly different between them. Beyond the intangible ratios of the two matched samples being similar, the equity crowdfunded firms have a significantly higher number of patent applications. This evidence supports the hypothesis that equity crowdfunded firms exhibit higher innovative performance, relative to matched non-crowdfunded firms that raised other sources of capital.

[Eldridge, Nisar, and Torchia \(2021\)](#) also investigate the impact of ECF on innovation and growth opportunities of SMEs, using a sample of 230 firms crowdfunded in Crowdcube (UK), and a control group of 225 non-crowdfunded firms. They find evidence that ECF has a positive impact on firms' growth opportunities and firm performance but does not lead to an increase in the level of innovation. The authors argue that listing in an ECF platform provides firms with reduced funding costs and knowledge from external investors about products and brand development processes, contributing to the development and growth of firms.

Nonetheless, despite the potential non-financial benefits of ECF crowdfunding ([Brown et al., 2019](#); [Walthoff-Borm, Vanacker, et al., 2018](#)), such as feedback and the direct involvement of crowd investors, [Di Pietro, Bogers, and Prencipe \(2021\)](#) highlight that post-campaign engagement with crowd investors (crowd networks) can face organisational

obstacles due to lack of time and human resources to deal with the crowd, lack of trust (difficulties in assessing the genuine interest of crowd investors) and informational asymmetries about the crowd's expertise. The authors also identify some ways of overcoming these barriers such as the use of a dedicated coordination technology (e.g., communication via crowdfunding platform), mapping investors' expertise, crowd stratification and use of a specific language and proactive communication.

[Troise, Matricano, Candelo, and Sorrentino \(2020\)](#) investigate whether intellectual capital (human, structural and relational dimensions) is related to the post campaigns growth of equity-crowdfunded firms. They find evidence of a significant and positive effect of prior industry experience (human capital) on sales growth, product innovation (structural capital) on employment growth and equity offered (relational capital) on both sales and employment growth of firms after being successfully crowdfunded.

[Troise, Tani, Dinsmore, and Schiuma \(2021\)](#) using a survey of 60 agri-food firms in Italy, find that these firms use open innovation platforms to change their innovation trajectories based on knowledge-based crowd inputs. They use crowd inputs to implement sustainability-oriented innovations after the ECF campaigns and use inputs on product innovations to enhance economic and environmental sustainability.

While the previous research only use samples of firms with successful ECF campaigns, [Cho et al. \(2019\)](#) compare firms with succeeded ECF campaigns and firms with failed ECF campaigns. They find that the employment growth is significantly higher for companies that succeeded in crowdfunding projects compared to companies that did not, but they do not find significant differences between the two groups in terms of sales growth and profitability.

Although research about the outcomes after the ECF campaigns, in terms of survival, follow-on funding and firm performance, have emerged in recent years, the results are not consistent and further investigation is needed. As we can see in **Table 12** the empirical evidence related to post-campaign outcomes is based on relatively small samples and focused mainly on the European market. So, future research may benefit from larger samples and the inclusion of firms outside Europe. Additionally, none of the papers investigated whether firms that failed ECF campaigns were able to get alternative financing.

Table 12 - Summary of main findings of literature about post-campaign outcomes

Paper	Research Design	Data (sample)	Main results/conclusions
Drover, Wood et al. (2017)	Empirical (quantitative)	Online experiment with 104 VC	The willingness of VCs to conduct due diligence is significantly higher in platforms that have an established record of investment success. The certification effect of the crowd investors depends on the crowdfunding model used - while in the reward model, the number of crowd investors has a significant influence on VC decisions to conduct due diligence, in the lending and equity models such effect is not significant.
Di Pietro et al. (2018)	Empirical (qualitative)	60 crowdfunded firms (UK, Netherlands, Sweden, France, and Germany)	The use of crowd equity investors in open innovation platforms is related to the later success of start-ups. Start-ups that explore crowd network ties are more likely to be successful later (in terms of survival rates and fundraising achievements) than start-ups that do not gain knowledge from the crowd.
Hornuf et al. (2018)	Empirical (quantitative)	413 firms successfully funded by ECF in Germany and the UK	German firms that received equity crowdfunding stood a higher chance of obtaining follow-up funding through BA/VC but also had a higher likelihood of failure, relatively to UK firms. The number of initial VC investors and the pre-money valuation of the firm increases the hazard of firm failure, but the number of senior managers and the amount raised in ECF campaigns have a negative impact. The post-campaign financing is positively influenced by the number of senior managers and by the number of initial VC investors and negatively influenced by the average age of the senior management team.
Signori and Vismara (2018)	Empirical (quantitative)	212 funded offerings on Crowdcube (UK)	Failure rates of crowdfunded firms decrease with the presence of qualified investors, positive sales, shares without voting rights and quick success in ECF campaigns. Firm age, diversification, presence of non-executive directors, patents, equity offered, and the number of investors are not significantly associated with the hazard ratio of failure. Younger firms, with positive sales, with non-executive directors, patents, without voting rights, and with quick success in the initial ECF campaign, are more likely to get a successful outcome in terms of follow-on funding.
Walthoff-Born, Vanacker, et al. (2018)	Empirical (quantitative)	205 equity-crowdfunded firms in Crowdcube and Seedrs (UK) and 205 non-crowdfunded firms	Equity crowdfunded firms exhibit higher innovative performance relative to matched non-crowdfunded firms. Both groups of firms accumulate significant losses over time and the median firm profitability in post-campaigns is not significantly different between them.
Brown et al. (2019)	Empirical (quantitative)	63 interviews with representants of equity crowdfunded firms in the UK (Crowdcube, Seedrs and Syndicate Room)	Highlights the role of different networks during the crowdfunding process. While in the pre-crowdfunding phase, the existing personal networks are dominant, after the campaign starts the entrepreneurs focus on raising new (weak) business networks (crucial for success in the ECF campaign). After campaigns, the focus of entrepreneurs shifts again, to deepening the business network ties. Findings also corroborate that being successful in ECF facilitates follow-on funding. The interaction with crowd investors also provides non-tangible benefits, relevant for future firm performance.
Cho et al. (2019)	Empirical (quantitative)	228 ECF campaigns (from 218 companies) in South Korea	The employment growth is significantly higher for companies that succeed in crowdfunding projects compared to companies that did not, but do not find significant differences between the two groups in terms of survival rate, sales growth, and profitability.

Paper	Research Design	Data (sample)	Main results/conclusions
Cumming, Meoli, et al. (2019)	Empirical (quantitative)	491 Equity offerings posted on Crowdcube (UK)	A high separation between ownership and control has significant effects on campaign success and post-campaign outcomes. The existence of a high ratio between voting and cash flow rights negatively influences the success of the offering, reduces the probability of long-term success, and decreases the likelihood of survival after the campaign.
Bessière et al. (2020)	Theoretical model & Qualitative	Case study of a French firm financed by reward crowdfunding, ECF, BA and VC.	Propose a model of sequential and co-investment for follow-on funding, where each actor (ECF, BA and VC) play a significant role in each funding round. First, the venture is financed by reward-based crowdfunding Then the start-up moves to ECF via co-investments with BA and, in the third stage, is used BA and VC. The success of follow-on funding depends on the consistency of the funding path.
Butticè et al. (2020)	Empirical (quantitative)	290 ECF firms in Crowdcube and Seedrs (UK) and 2 control samples (firms without external funding and angel-backed firms)	Compared to firms that have not received any seed financing, equity crowdfunded firms are more likely to receive subsequent VC funding. Receiving ECF through a nominee shareholder structure also positively affects the attraction of subsequent VC financing, compared to firms financed by the ECF using direct shareholder structures or firms backed by BA.
Jo and Yang (2020)	Empirical (quantitative)	614 campaigns in Crowdcube (UK) that provide financial forecasts	Financial forecasts provided in ECF campaigns are of poor quality and optimistically biased. Firm survival is not influenced by forecasted sales and lack of dividends, but firms that anticipate the need for subsequent equity financing, predict the repayment of pre-campaign debt and firms with problematic forecasts are more likely to fail in the future.
Troise et al. (2020)	Empirical (quantitative)	51 successful equity-crowdfunded projects listed on 7 Italian platforms.	The three dimensions of intellectual capital (human, structural and relational) are positively related to the post-campaign growth of equity-crowdfunded firms. Find evidence of a positive effect of prior industry experience (human capital) on sales growth, product innovation (structural capital) on employment growth and equity offered (relational capital) on both sales and employment growth of equity-crowdfunded firms.
Coakley et al. (2021)	Empirical (quantitative)	709 ECF firms from Crowdcube, Seedrs and SyndicateRoom (UK)	The probability of a successful first SECO campaign is positively influenced by the pre-money valuation gains (between sequential campaigns) and by the initial number of investors. However, such probability is reduced by the equity offered in the initial campaign. Employing a direct model for shareholders structure, in comparison to a nominee structure or a co-investment model, reduces the probability of conducting a successful first SECO.
Di Pietro et al. (2021)	Empirical (qualitative)	60 European equity crowdfunded ventures	Crowd equity investors can contribute to the performance of start-up firms by providing inputs related to product development, the definition of a business growth strategy and help with expansion into new markets, market knowledge, and access to network ties with industry players and other relevant stakeholders. However, those benefits are not the same for all start-ups and it depends on start-ups' and founders' characteristics. Post-campaign engagement with crowd investors can be difficult due to organisational barriers (lack of time and human resources, lack of trust and informational asymmetries). To overcome these barriers, entrepreneurs can use dedicated coordination technology, mapping investors' expertise, crowd stratification and use of a specific language and proactive communication.

Paper	Research Design	Data (sample)	Main results/conclusions
Eldridge et al. (2021)	Empirical (quantitative)	230 ECF firms (Crowdcube, UK) and a control sample of 225 non-crowdfunded firms	ECF has a positive impact on firms' growth opportunities and firm performance but does not lead to an increase in the level of innovation.
Hornuf et al. (2021)	Empirical (quantitative)	256 ECF contracts from 19 German ECF platforms	Crowd investing contracts in Germany tend to be similar to VC contracts, including the same covenants. However, cash flow and control rights do not influence the likelihood of liquidation or the probability of receiving follow-on funding from professional investors. Yet, exit rights enable investors to exit the contracts early, forcing the start-ups to repay them, and triggering insolvency more quickly. Exit rights also affect the follow-on funding.
Moedl (2021)	Empirical (qualitative and quantitative)	20 interviews with VC and BA and an online survey of 134 VC/BA investors (Germany)	Contractual frictions of securities-based crowdfunding play an important role in subsequent venture capital investment decisions. The most problematic covenants of ECF contracts are (i) no pooling (direct securities); (ii) right of termination; (iii) upward dilution protection and the non-existence of a drag-along clause.
O' Reilly et al. (2021)	Empirical (quantitative)	177 Cleantech firms that have successfully raised ECF in Europe	The financing options before the ECF campaigns have an impact on post-campaign. Successful ECF campaigns have a positive impact on the ability to raise external financing post-campaign and firms that raised debt financing before the ECF campaign are more likely to raise debt and equity funding after the campaign.
Reichenbach and Walther (2021)	Empirical (quantitative)	88 campaigns from the Companisto platform (Germany)	The probability of firm failure decreases when the CEO holds a university degree and the equity offered is higher. Large investments, reputable investors, and the number of updates do not influence the failure rate of ECF firms. Updates on business-related information are a positive signal, while updates on external certification, promotions and teams act as negative signals that increase the likelihood of failure.
C. Troise et al. (2021)	Empirical (quantitative)	60 Agri-food companies that successfully complete ECF campaigns (Italy)	Agri-food firms that use open innovation platforms change their innovation trajectories based on knowledge-based crowd inputs. They use crowd inputs to implement sustainability-oriented innovations after the ECF campaigns and use inputs on product innovations to enhance economic and environmental sustainability.
Coakley et al. (2022)	Empirical (quantitative)	1291 ECF initial campaigns from Crowdcube, Seedrs and SyndicateRoom (UK)	Founder teams outperform solo ventures in equity crowdfunding. Founder teams attract professional investors, and their monitoring role helps to minimize moral hazard concerns, lowering the likelihood of the firm going bankrupt later.

2.7. Conclusion

This study presents a systematic literature review of 139 research papers about equity crowdfunding. Since the first paper was published just over ten years ago, the number of documents published about ECF has increased exponentially. In the last year alone (2021), at least 75 papers on ECF were published. Given the growing interest in this topic, the literature about crowdfunding is currently vast, covering a wide range of issues that justifies the need to draw a comprehensive and up-to-date framework for ECF research. We chose to use a systematic approach to the literature review as this is considered the most efficient method for identifying and reviewing extensive literature ([Tranfield et al., 2003](#)).

We organised the literature review according to the investment process. Thus, starting with the phase before the launch of the ECF campaign, the first chapters were dedicated to the literature review about (i) the comparison of ECF with traditional sources of entrepreneurial funding, such as Venture Capital and Business Angels; (ii) why and when entrepreneurs prefer ECF and (iii) the different models of ECF platforms. The following chapter was dedicated to literature about the drivers of the fundraising success of ECF campaigns. Given the extensive literature on this topic, we organised the review into six subtopics. The first three subtopics were related to the campaigns and addressed the signals of the venture's quality (campaigns characteristics, human and social capital), information disclosure to reduce the information asymmetries, other motivations (non-financial) of the funders and the relevance of investment process of ECF to the success of ECF campaigns. The other two subtopics were related to the most recent topics in the literature, namely the investors' heterogeneity and (biased) behaviours and success factors of ECF related to the country-level characteristics. Finally, the last topic of the literature review was dedicated to the post-investment phase, where we analysed the post-campaign outcomes in terms of failure rate, follow-on funding, and firm performance of firms previously engaged in ECF campaigns.

Throughout this document, in addition to presenting an organised summary of the literature on this new way of financing start-ups, we also identified some inconsistencies and gaps in the existing literature, providing some clues for further investigations.

In many cases, the research about ECF is not consensual and needs further investigation to integrate the previous, apparently contradictory empirical results in some topics. For

instance, it is still unclear if ECF contributes to the democratisation of entrepreneurial finance, alleviating some of the distance-related economic frictions between entrepreneurs and investors and enhancing the presence of underrepresented groups of potential entrepreneurs (in terms of gender and race, such as female and black persons). In the same way, the empirical evidence about the relevance of intellectual capital (patents), team characteristics or social networks for funding success is not consistent.

Furthermore, it is somewhat intriguing why empirical research finds no evidence that the provision of tax reliefs has a significant impact on the probability of the ECF campaign's success ([Vismara, 2016, 2018](#); [Vulkan et al., 2016](#)) when it can reduce the investment cost (risk) for investors.

It is also unclear if the herding behaviour observed in ECF campaigns is a rational decision of investors or not, namely if it induces subsequent investors to deviate from their typical investment behaviour ([Walther & Bade, 2020](#)) and popular overfunding campaigns ([Li et al., 2020](#)).

Only a few papers consider the competition among the independent variables (usually only as a control variable) about drivers of fundraising success, and the results are somewhat inconsistent¹⁹.

Although there is already diverse literature on investors' heterogeneity and behaviour, it is still very disintegrated, so future research could benefit from the attempt to integrate the different perspectives analysed by previous literature.

We also find scarce literature on the influence of country-level characteristics on the outcomes of ECF campaigns (only three papers). This topic should be explored in future research.

Although research about the outcomes after the ECF campaigns, in terms of survival, follow-on funding and firm performance, have emerged in recent years, the results are inconsistent, and further investigation is needed. Additionally, empirical research on firms after the campaigns has some limitations: (i) given the short time window between the initial offering

¹⁹ We tried to reduce this limitation with our second paper of the thesis.

and the post-offering outcomes ([Signori & Vismara, 2018](#)), (ii) most of the paper analyses only successfully funded initial equity offerings, excluding firms with failed campaigns ([Hornuf et al., 2018](#); [Signori & Vismara, 2018](#); [Walthoff-Borm, Vanacker, et al., 2018](#)).

In some cases, the contradictory empirical results may be related to the use of small samples and inappropriate proxy variables. On the one hand, given the inexistence of databases about start-ups looking for ECF that include successful and unsuccessful campaigns, data is often hand-collected. Consequently, most samples are relatively small and mainly focused on one or two platforms. On the other hand, some information about campaigns and entrepreneurs is difficult to obtain, causing some results to be biased by using inappropriate variables. Thus, future research may benefit from larger samples and the inclusion of more relevant variables.

We also find several topics are still unexplored (or have a very limited number of papers), such as the exit options for crowd investors; the liquidity and relevance of the secondary market created recently for some platforms (ex. Seedrs), the pre-selection process of investment proposals of platforms before launching the campaigns online on their websites; empirical evidence on how the differences across equity crowdfunding platforms influence the success of equity crowdfunding campaigns and post-campaign firm outcomes ([Cumming, Johan, et al., 2019](#)); international comparisons.

Finally, while most of the papers are descriptive or empirical, there are some (few) theoretical models, namely about (i) the choice between reward and equity crowdfunding ([Belleflamme et al., 2014](#); [Miglo & Miglo, 2019](#)), (ii) how entrepreneurial bias affects the outcome of a crowdfunding campaign ([Miglo, 2021](#)), (iii) how the platform competition can lead to segmentation of the two sides of the market ([Gal-Or et al., 2019](#)) and (iv) how equity crowdfunding can aggregate decentralised consumer information and efficiently allocate capital to new firms and technologies ([Grüner & Siemroth, 2019](#)). However, empirical evidence is missing that could confirm the predictions of these models.

Given the broad scope of the paper, this literature review can be very helpful for academics as it provides a structured and organised review of the main contributions of previous research on ECF and identifies possible topics for future research. It could also be relevant for all the players in the ECF market: entrepreneurs, investors, platforms, and regulators. For instance, entrepreneurs can use the information about the drivers of fundraising success to

improve their campaigns and identify the circumstances in which ECF may be preferable to VC/BA, as well as the most suitable platform model for their projects. The results of the previous empirical research can also be used by platforms (to improve their services, profitability and reputation), investors (to select the projects with more appropriate risk-return) and regulators (to improve the ECF regulation to protect investors from the risk of fraud and reduce information asymmetries).

Despite the advantages and relevance of this literature review, it also has some limitations. For instance, it is focused on published academic papers on economic and financial issues of ECF, excluding other dimensions of this phenomenon (e.g., marketing and regulation) and eventually relevant contributions from works not yet peer-reviewed. Finally, while we have sought to provide an up-to-date and comprehensive review of current ECF literature if ECF research continues to grow as it has in recent years, this document could become outdated or at least incomplete for some time.

3. THE ROLE OF COMPETITION ON EQUITY CROWDFUNDING

3.1. Introduction

The deterioration of financing conditions during the financial crisis of 2007/2008 and the growing phenomenon of disintermediation (derived from technological, social, and cultural changes) contributed to the emergence and growth of alternative sources of financing for start-ups ([Wardrop et al., 2015](#)). In fact, in the last decade, we observed a transformation in the financial system associated with the development of fintech and the proliferation of several alternatives outside the traditional financial system ([Allen, Gu, & Jagtiani, 2021](#)). Crowdfunding is one of those alternatives, where entrepreneurs or start-ups receive (small) contributions from a potentially large number of individuals, in exchange for some type of compensation, usually through an internet platform (without standard financial intermediaries), for financing their projects. Initially, crowdfunding was essentially devoted to offering gifts/rewards for arts and entertainment projects but, meanwhile, more complex, and structured models have been developed ([Bruton et al., 2015](#)). One of those models is Equity Crowdfunding²⁰, where funders (or investors) receive a company share (equity), a fraction of revenue or a profit-share arrangement.

The previous literature about equity crowdfunding is mainly focused on the success determinants of campaigns. Given the high information asymmetries of start-ups and the associated adverse selection problems ([Akerlof, 1970](#)), many of the papers explore the role of signals ([Spence, 1973](#)) about project quality, like equity retention ([Ahlers et al., 2015](#); [Vismara, 2016](#)), third-party certification ([Hornuf & Schwienbacher, 2018b](#); [Kleinert et al., 2020](#); [Ralcheva & Roosenboom, 2016](#); [Vulkan et al., 2016](#)) and patents ([Ahlers et al., 2015](#); [Piva & Rossi-Lamastra, 2018](#); [Ralcheva & Roosenboom, 2016](#); [Vismara, 2018](#)). Previous research on Equity Crowdfunding also analyses how the quality of team management influences fundraising success, measured by team management's qualifications ([Ahlers et al., 2015](#); [Kleinert et al., 2020](#); [Piva & Rossi-Lamastra, 2018](#)), team size ([Ahlers et al., 2015](#); [Vismara, 2016, 2018](#)), the presence of non-executive directors ([Ahlers et al., 2015](#); [Kleinert et al., 2020](#); [Vismara, 2018](#)) or serial founders ([Kleinert et al., 2020](#)). Others focus their

²⁰ To learn more about the history of ECF platforms and their development since their appearance in 2010, please see [Coakley and Lazos \(2021\)](#).

research on the relevance of information disclosure, on the pitch but also during the campaign, such as comments and updates ([Ahlers et al., 2015](#); [J. Block et al., 2018](#); [Guenther et al., 2018](#); [Hornuf & Schwienbacher, 2018b](#); [Kleinert & Volkmann, 2019](#); [Vismara, 2016](#)), as well as on herding behaviour ([Agrawal et al., 2015](#); [Ástebro, Fernández Sierra, Lovo, & Vulkan, 2017](#); [Hornuf & Schwienbacher, 2018b](#)), and other motivations, such as tax reliefs and non-monetary rewards ([Cholakova & Clarysse, 2015](#); [Vismara, 2016](#); [Vulkan et al., 2016](#)).

As in some of the previous papers on equity crowdfunding, we study the determinants of campaign success. However, to the best of our knowledge, this is the first paper focused on the role of competition in equity crowdfunding campaigns.

Some previous literature has already studied the effect of competition in other crowdfunding models, such as the reward model ([Kuppuswamy & Bayus, 2014](#)), microfinance ([Ly & Mason, 2012](#)) and donation ([Meer, 2014](#)). However, in the context of equity crowdfunding, the role of competition has been neglected even if, as in any other market, ECF campaigns compete for the attention of potential investors that need to decide which campaign to invest in. So, our research question is: does competition have a relevant effect on equity crowdfunding campaigns?

So, using a unique hand-collected database of 1,487 campaigns, and 66,180 daily observations, from the two biggest equity crowdfunding platforms in the UK (Seedrs and Crowdcube), between 2015 and 2018, we investigate the role of competition on the performance of equity crowdfunding campaigns.

Prior studies in the context of entrepreneurship emphasize the competition relevance for firm performance ([Hernández-Carrión et al., 2017](#); [Nickell, 1996](#); [Nocke, 2006](#)), product and process innovation ([Boone, 2000](#); [Spulber, 2010](#)), entrepreneurs' decision of entry and exit the industry ([Spulber, 2010](#)), and whether it contributes to the allocation of resources to the most efficient firms ([Olley & Pakes, 1996](#)). Our work extends competition research into fundraising, arguing that competition may also influence the outcomes of equity crowdfunding campaigns. Assuming that the availability of financial funding is limited, the equity crowdfunding market can be viewed as a zero-sum game and if a campaign attracts more funding, the other projects may end up with less ([Lin, Lee, & Yin, 2018](#)). Thus, similarly

to other crowdfunding models, we propose that competition intensity affects the performance of equity crowdfunding campaigns.

Some previous research on reward crowdfunding, also highlights the “Blockbuster Effect”, according to which a widely visible and popular project (with a large number of backers) steals potential backers from other projects ([J. Block et al., 2018](#)). Thus, in the presence of a blockbuster project, the other projects are less likely to succeed in their crowdfunding campaigns. However, based on the argument that the effects of blockbuster projects could be different for projects in the same category and projects in other categories ([Liu, Yang, Wang, & Hahn, 2015](#)), we expect that blockbuster projects exhibit positive spillover effects on projects in the same category (industry) but cannibalization effects on projects in other categories (other industries).

In the comparison between successful (campaigns funded) and unsuccessful campaigns, we found that: (i) the average number of competing campaigns is significantly lower for successful campaigns; (ii) the presence of blockbuster projects also seems to be relevant to the success of campaigns, (iii) such effect is positive for projects in the same industry but, it is negative for both the presence of blockbuster projects from other industries and for all industries. These results are confirmed in the multivariate analyses when we consider only the variables related to competition. However, controlling for other drivers of fundraising success previously studied in the literature, we cannot confirm that the number of competing campaigns has significant relevance for the outcome of the campaign (to be funded or not). However, we find evidence of the “cannibalization” effect of blockbuster projects from other industries.

When we analyse the role of competition during the campaign, we find that the number of competing campaigns negatively influences the daily investment amount and the daily number of investors in the campaign, but the relevance of blockbuster projects on the dynamics of the campaign is not so clear. A probable explanation for these results could be that, as the effects of blockbuster projects last over time, it is more difficult to capture and highlight this effect in a daily analysis.

Given our larger sample, covering a longer period of Equity Crowdfunding activity (around three and a half years) than previous literature, we also do a detailed characterization of the campaigns. Previous literature has some limitations related to the sample, namely its small size, limited to campaigns from one platform, and that covers a period (and country) when (where) the equity crowdfunding market was less developed. For instance, [Ahlers et al. \(2015\)](#) analyse an Australian platform between 2006 and 2011, during a period when equity crowdfunding was still unknown to the general public. ([Hornuf & Schwienbacher, 2018b](#)) use 89 campaigns to study the German market which has different characteristics from the United Kingdom. For instance, equity crowdfunding platforms in Germany offer mezzanine financial instruments, instead of common shares on a PPL company, and the main mechanism of equity crowdfunding in the UK does not limit the investments after the funding goal is achieved. [Lukkarinen et al. \(2016\)](#) use a sample of only 60 campaigns from the platform Invesdor in Finland. [Vulkan et al. \(2016\)](#) use a larger sample (636 campaigns) but are limited to one platform (Seedrs). As [Vismara \(2016\)](#), our data is from the two biggest equity crowdfunding platforms in the UK. However, we use a larger and more recent sample (1,487 campaigns from 2015 to 2018, while Vismara uses a sample of 271 campaigns from 2011 to 2014). The relevance of sample size is stated by Vismara himself, “*future studies will benefit from larger samples*” (p. 588), and in the last years the equity crowdfunding market has grown significantly and become more mature. Moreover, we collected exhaustive information about the campaigns, the firms and project teams, which allowed us to carry out a very detailed characterization of equity crowdfunding in the UK, the most relevant equity crowdfunding market in Europe.

The remainder of this chapter paper proceeds as follows. Section 3.2 is dedicated to the literature review about the role of competition and other drivers of fundraising success in equity crowdfunding. We describe the sample and variables in Section 3.3. The following section focuses on descriptive analyse, and it includes the campaign’s characterization and the comparison between successful and unsuccessful campaigns. The multivariate analysis is discussed in Section 3.5. It starts by studying the competition effect on campaign success and then analyses the role of competition during the campaign. First, we explore the effect of competition on the outcome of the campaign (success or unsuccess in obtaining the funding). Then, we analyse the role of competition during the campaign. We conclude the paper in Section 3.6.

3.2. Literature review and hypotheses development

3.2.1. The role of competition in crowdfunding

Prior studies in the context of entrepreneurship emphasize the competition relevance for firm performance ([Hernández-Carrión et al., 2017](#); [Nickell, 1996](#); [Nocke, 2006](#)), product and process innovation ([Boone, 2000](#); [Spulber, 2010](#)), entrepreneurs' decision of entry and exit the industry ([Spulber, 2010](#)) and that it contributes to the allocation of resources to the most efficient firms ([Olley & Pakes, 1996](#)). Our work extends competition research into fundraising, arguing that competition may also influence the outcomes of equity crowdfunding campaigns. While in the marketing perspective, firms compete for potential consumers to increase their sales and market share, in equity crowdfunding, firms compete for potential funders and to get the financial resources for their projects. Assuming that the availability of financial funding is limited, the equity crowdfunding market can be viewed as a zero-sum game and if a campaign attracts more funding, the other projects may end up with less ([Lin et al., 2018](#)). Moreover, the ability of entrepreneurs to get resources could be lower in the context of highly competitive intensity ([Hernández-Carrión et al., 2017](#)). This way, the competitive environment can influence the definition of the best strategy for entrepreneurs to enhance the probability of success of equity crowdfunding campaigns, including the decision about the best time for starting or exiting the campaign and how to capture the attention of potential funders.

The research in equity crowdfunding is mainly focused on the determinants of campaign success, but surprisingly the role of competition among projects has been neglected. Only a few empirical papers on equity crowdfunding consider competition among the independent variables, and even in these cases, competition is usually used only as a control variable of the drivers of fundraising success ([J. Block et al., 2018](#); [Kleinert & Volkmann, 2019](#); [Vismara, 2018](#)), or as an instrumental variable ([Coakley et al., 2018](#); [Signori & Vismara, 2018](#)). So, to our knowledge, this is the first paper exploring the effect of competition on the outcomes of equity crowdfunding campaigns.

However, if we expand the literature review to other models, we find a few papers that already investigated the effect of competition on crowdfunding. For instance, [Lin et al. \(2018\)](#)

propose a theoretical model – Dynamic Market Competition – to determine the competitiveness of crowdfunding projects and to predict the success of the campaign. According to this model, the project competition process is divided into two steps. The first step is the setup of the project competition space (determined by the project content, which is an aggregation of its characteristics such as category, description, rewards, price, duration, and pledging goals) and, the second step, defines how the funds are allocated (determines how the funds are distributed among the projects). They also analyse the dynamics of projects' competitiveness, namely in terms of funding progress towards the goal from the start to the end of the campaign. They found that the funding progress impacts the daily amount of funds collected, as a project receives more (daily) funds at the beginning and the end of the campaign, and when it approaches its target amount.

Moreover, the empirical research on other crowdfunding models found evidence that increased competition reduces the likelihood of a project being funded, both in the microfinance model ([Ly & Mason, 2012](#)) and in the donation crowdfunding model ([Meer, 2014](#)). [Ly and Mason \(2012\)](#) use data from Kiva, a peer-to-peer (P2P) online microfinance platform, to investigate the effect of competition between microfinance non-government organizations on their ability to raise funds from individual social investors. They find that an increase in the number of competing projects has a sizable negative impact on projects' funding speed. Using data from DonorsChoose.org, an online platform linking teachers with prospective donors, [Meer \(2014\)](#) finds a strong negative effect of the number of competing projects on the likelihood of funding, suggesting that projects on this platform are close substitutes. Thus, similarly to other crowdfunding models we propose that competition intensity affects the performance of equity crowdfunding campaigns, and our first hypothesis is:

H1: The higher the competitive intensity in equity crowdfunding platforms, the lower the probability of a campaign being successful.

Some previous research on reward crowdfunding, also highlights the “Blockbuster Effect”, according to which a widely visible and popular project (with a large number of backers) steals potential backers from other projects ([J. Block et al., 2018](#)). Thus, in the presence of a

blockbuster project, the other projects are less likely to succeed in their crowdfunding campaigns.

However, some argue that the “Blockbuster Effect” is probably not so relevant in the context of equity crowdfunding, because in this model the campaigns are not open-ended and there is a limit to the campaign’s size in terms of investment amount ([Hornuf & Schwienbacher, 2018b](#)). In fact, unlike reward crowdfunding models, under the regulations of many countries, there are legal limitations on the maximum amount of offerings in equity crowdfunding ([Hornuf & Schwienbacher, 2017](#); [Rossi, Vanacker, & Vismara, 2021](#)), and most entrepreneurs may not be willing to give up of the ownership majority, which would imply losing the control of the firm.

However, we argue that even if the “Blockbuster Effect” could be less frequent in the context of equity crowdfunding, the network effects can still be relevant, given that crowdfunding platforms operate as two-sided markets ([Thies et al., 2018](#)).

The impact of the network effects on competition, in the context of two-sided markets, has already been pointed out by several authors ([Armstrong, 2006](#); [Rochet & Tirole, 2003](#)). However, while previous research focuses on platform competition in two-sided markets, we are interested in the network effects on competition between agents from one side of the market (particularly among projects or campaigns).

According to the definition of [Rysman \(2009\)](#), a two-sided market is one in which “two sets of agents interact through an intermediary or platform, and where the decisions of each set of agents affect the outcomes of the other set of agents, typically through an externality”. (p. 125). In the equity crowdfunding market, the platform is the intermediary, and the two sets of agents are the investors and the entrepreneurs/companies who launch the campaign. A platform is attractive to investors if it has many quality projects (campaigns) to invest in, and it is attractive to entrepreneurs if it has many registered investors. Neither investors nor entrepreneurs will be interested in using the platform if the other group is not doing so.

Recognizing this market structure, platforms try to attract good projects, as well as many investors²¹.

Equity crowdfunding platforms, as in other two-sided markets, are characterized by the existence of networks within and between market participants ([Thies et al., 2018](#)). An example of the same side network effect (positive or negative network externality) is the social media platforms (e.g., Facebook): the social media platform is more valuable for a given social network user the greater the number of users. In terms of cross-side effects, an illustrative example is Airbnb, where the value of the platform is higher for Airbnb's consumers, the higher the number of agents (listed properties) and vice-versa.

In equity crowdfunding platforms, we can also observe network effects within and between groups. From the point of view of the demand side group (investors), we may expect positive network effects for both cross-side and same-side groups. The higher the number of registered investors in the platform, the higher the likelihood of entrepreneurs (campaigns) attracting investors to their project and reaching the target value, suggesting the existence of a positive cross-side network effect. Moreover, as the equity crowdfunding platforms usually use the *all-or-nothing* funding model ([Cumming, Leboeuf, & Schwienbacher, 2020](#)), i.e., the projects are financed only if they reach the pre-defined funding target amount, the higher number of registered investors in the platform, the higher the probability of a specific project reach the target and get the funding. This way, a higher number of registered investors in the platform also have positive effects on other investors (positive same-side network effects) because, this way, they can expect a higher probability of the projects where they invest to be successful.

From the point of view of the supply side (entrepreneurs with equity crowdfunding campaigns), the cross-side network effect is expected to be positive, because the higher number of campaigns on the platforms increases the investment opportunities for investors. However, the direction of the same-side network effects is not so clear. On the one hand, a higher number of simultaneous campaigns can have a negative network effect, because each project has to compete with all other projects for the attention of the crowd ([Thies et al.,](#)

²¹ For instance, Seedrs pays anyone that refers a new investor, 50% of the fees they charge to the business on any investment the investor makes over two years.

2018). However, on the other hand, as many of the investors on each campaign are from the team's network, such as family & friends (Agrawal et al., 2015), each new campaign usually helps platforms attract new investors. Moreover, Thies et al. (2018), using data from a reward crowdfunding platform (Kickstarter), find empirical evidence that an increase in the number of campaigns in a given period increases the number of investors in subsequent periods. Thus, from a dynamic perspective, a growing number of active campaigns helps the platform to attract new investors to the platform, which in turn increases the probability of success of other campaigns. This way, we argue that we can also observe a positive same-side network effect on the supply side.

In the context of reward crowdfunding, Liu et al. (2015) argue that the effects of blockbuster projects are different for projects in the same category and projects in other categories. As blockbuster projects increase the size of the project network, they attract new backers into the platform and increase the activeness of existing backers, benefiting the funding performance of other projects in the same category. However, the authors argue (and find evidence) that these positive effects are less likely to spill over to other categories, as new backers will be inclined to invest in projects of the same category of blockbuster projects. On contrary, the projects of other categories can suffer a “cannibalization effect” (Ghose, Smith, & Telang, 2006). The blockbuster projects may also intensify the market competition and capture the attention and resources of backers to projects of the same category that otherwise could invest in projects from other categories. This way, the authors find evidence that blockbuster projects exhibit positive spillover effects on projects in the same category but cannibalization effects on projects in other categories.

Thereby, as for reward crowdfunding models (Liu et al., 2015), we expect that blockbuster projects exhibit positive spillover effects on projects in the same category (industry) but cannibalization effects on projects in other categories (other industries).

H2a: The presence of blockbuster projects in the same category has a positive spillover effect on projects of the same categories.

H2b: The presence of blockbuster projects in the other categories has negative effects on the success of a campaign (cannibalization effect).

3.2.2. Other determinants of fundraising success in equity crowdfunding

Empirical research on equity crowdfunding has focused on the factors that may influence the success of an equity crowdfunding campaign²². Therefore, we also introduce a brief review of the main results obtained so far.

From a static point of view, those factors are related to project quality, team quality, social capital, and information disclosure, among other motivations, such as tax reliefs and non-financial rewards. From a dynamic point of view, some authors also suggest the existence of a herding behaviour of investors, arguing that the dynamic of the first days (amount and number of investors) is crucial to the campaign's success.

In general, investors face problems of information asymmetry that imply difficulties in selecting high-quality projects. This problem is exacerbated in equity crowdfunding, in the presence of small investors to whom due diligence and monitoring costs are relatively higher. This way, investors need to find out signals of project quality to reduce such costs and be able to select the best projects. As predicted by the signalling theory ([Busenitz et al., 2005](#); [Leland & Pyle, 1977](#)), the entrepreneurs' willingness to invest in their projects is perceived as a signal of project quality. Entrepreneurs own private information that allows them to better evaluate the project quality. In the presence of high-quality projects, the entrepreneur will try to keep the highest share of capital possible. Considering these arguments, previous literature on equity crowdfunding confirms that **equity retention** is a relevant sign of project quality, and a key factor for the success of campaigns ([Ahlers et al., 2015](#); [Vismara, 2016](#)).

Venture capital and business angels' investors play a relevant role in start-ups, providing mentoring, support services (such as helping in the development of the business plan, facilitating strategic partnerships, building the firm's internal organization, accessing other financial intermediaries) and certification of firm quality ([Denis, 2004](#); [Hellmann & Puri, 2002](#)). Thus, smaller and less informed investors may benefit from the quality certification of institutional and bigger investors ([Megginson & Weiss, 1991](#)). Additionally, some authors

²² For a literature review on equity crowdfunding see for instance ([Coakley & Lazos, 2021](#)).

also highlight the ability of venture capitalists to identify start-ups with high growth potential ([Baum & Silverman, 2004](#)), while others suggest that the probability of failure is lower for firms financed by venture capital ([Puri & Zarutskie, 2012](#)). This way, previous research suggests that small investors in equity crowdfunding may benefit from the advantages of the **presence of large institutional investors** in the selection, monitoring, and management support ([Hornuf & Schwienbacher, 2015](#)).

Given the lack of history and the absence of a credible reputation ([Huyghebaert & Van de Gucht, 2007](#)), start-ups have higher information asymmetries and agency costs than older firms. However, younger firms invest more in R&D ([Czarnitzki & Kraft, 2004](#)), and young innovative firms are more able to grow than mature firms, even though innovations undertaken by young firms are riskier, and less predictable than those from older firms ([Coald, Segarra, & Teruel, 2016](#)). This way, the impact of **firm age** on the success of equity crowdfunding campaigns is an empirical question. It can be positive (the probability of success increases with the age) because younger firms are riskier. Or it can be negative, given the lower growth perspectives of mature firms. The result varies according to the risk aversion of investors.

Previous research also emphasizes the importance of the monetary potential of the project/firm in the decision of venture capitalists and business angels to invest. Some argue informal investors attach considerable importance to the economic returns of the investments, and during the investment process, they assess the market and the product potential ([Landström, 1998](#)), while others suggest that the economic potential of the new venture positively affects the investment decisions in both venture capital and business angels, in terms of expected returns (above-market returns) and in expected time to break even ([Hsu et al., 2014](#)). Moreover, firm dimension, as well as growth perspectives, is one of the criteria used by venture capitalists to select firms in which to invest ([Puri & Zarutskie, 2012](#)). Some argue that monetary potential is one of the most relevant investment decision factors to venture capitalists. For instance, [Tyejee and Bruno \(1984\)](#) find that a firm's profit margin is a relevant factor in the expected return for venture capitalists. Accordantly, [Macmillan, Siegel, and Narasimha \(1985\)](#) show that the key financial concerns for venture capitalists are high upside potential and high investment liquidity. This way, investors prefer to invest in firms with high **economic potential**.

According to the previous literature on venture capital and business angels, **team quality** is a critical factor in the investment decision process for those investors. For small investors in equity crowdfunding, with a low ability to influence firm management in the future, the team's quality is probably even more relevant to firm success and the expected return on investment. In the crowdfunding context, [Piva and Rossi-Lamastra \(2018\)](#) found that entrepreneurs' business education and entrepreneurial experience contribute to the success of equity crowdfunding campaigns. According to [Bernstein et al. \(2017\)](#), team quality is relevant not only for pure signalling reasons but also for the operational capabilities and expertise of the founders.

Large teams have more capabilities to process information and provide more viewpoints (conflicting views reduce the probability of costly mistakes), so some authors suggest that large teams increase firms' performance ([Haleblian & Finkelstein, 1993](#)). Additionally, larger boards have more difficulties in achieving consensus, reducing the probability of taking extreme decisions, resulting that firm performance being less variable in firms with larger boards ([Cheng, 2008](#)). There is also empirical evidence that the number of founders can be a proxy of human quality and that start-ups with larger top management teams obtain more venture capital financing ([Baum & Silverman, 2004](#)).

Some studies emphasize the role of information disclosure during the campaigns, both in form of updates (new information provided by the entrepreneurs during the campaign) as well as Q&A posted during the campaign (questions raised by investors and answered by the entrepreneurs). These interactions contribute to reducing information asymmetries between investors and entrepreneurs, and they can have a positive influence on investors' decisions. Some empirical evidence regarding this already exists. For instance, Hornuf and Schvienbacher (2015) suggest that investors' decisions consider the updates as well as the comments of other investors during the campaigns in the German crowdfunding market, and Kuppuswamy and Bayus (2014) also find that, in the reward-crowdfunding platform Kickstarter, additional backer support is positively influenced by project updates.

In addition to the financial motivations (dividends and capital gains), other factors may influence the investment decisions of investors, such as tax reliefs and non-financial rewards.

However, the relevance of these non-financial motivations was not confirmed by previous studies on equity crowdfunding, neither for tax reliefs (Vismara, 2016; Vulkan et al., 2016) nor for non-financial rewards ([Cholakova & Clarysse, 2015](#); [Vismara, 2016](#)).

Previous research in ECF also finds that fundraising success is positively influenced by early investments, suggesting the existence of a herding behaviour of investors. Hornuf and Schwienbacher (2015) find a decrease in the probability of the next investment when it takes longer to conclude the previous ten investments and Vulkan et al. (2016) find that capital share accumulated in the first week of the campaign is one of the factors that are more strongly associated with the probability of success.

3.3. Sample and variables

3.3.1. Sample

Since there are no databases about crowdfunding campaigns and equity crowdfunding platforms only provide the public information available on their websites (which includes only the information about active campaigns and historical information about some of the successful campaigns), we (daily) hand-collected information about all campaigns ran on Crowdcube and Seedrs, two UK platforms, for more than three years, from April 7, 2015, to October 13, 2018. After excluding 47 campaigns with other forms of crowdfunding models (bonds, convertibles and funds), our sample has 66,180 daily observations from 1,487 equity crowdfunding campaigns (857 from Crowdcube and 630 from Seedrs).

We also added some complementary information about the companies (such as industry NACE²³ codes, number of directors, incorporation date and firm name), collected from the Companies House website²⁴, Infoempresa.com²⁵, Amadeus database and, in some cases, from companies' websites.

As we collected data about all the campaigns from Seedrs and Crowdcube platforms for more than three years, our database avoids selection or survivor biases. Furthermore, Crowdcube and Seedrs are the two biggest equity crowdfunding platforms in the UK according to Beauhurst's The Deal 2019 report²⁶ (95% of equity deals in the UK during 2019, 406 of 424, were done on these two platforms). Crowdcube was the first equity platform created in the UK, in 2011, and Seedrs was the first equity platform in the UK that obtained authorization to develop equity crowdfunding activity from Financial Conduct Authority, in 2012. By the beginning of 2020, more than 1,000 pitches had already been financed on each of these two platforms²⁷, including some unicorns (e.g. BrewDog, Revolut and Monzo). The

²³ Classification of economic activities used in the European Union.

²⁴ Companies House is an executive agency from the UK, sponsored by the Department for Business, Energy & Industrial Strategy. See <https://www.gov.uk/government/organisations/companies-house>.

²⁵ According to its website, <https://www.infoempresa.com>, this is a web service that provides financial and economic information on Spanish companies, their directors and business administrators.

²⁶ http://about.beauhurst.com/wp-content/uploads/2020/02/The-Deal-2019_WEB.pdf.

²⁷ Please see <https://www.crowdcube.com/explore/blog/crowdcube/our-top-10-breakthrough-moments> and <https://www.seedrs.com/learn/blog/2019-a-record-breaking-year>, accessed on March 2020.

UK is the most relevant equity crowdfunding market in Europe, capturing 68% of the alternative finance European market in 2017 ([Ziegler et al., 2019](#)). This way, our results are relevant to the entire equity crowdfunding industry in Europe.

3.3.2. Variables

3.3.2.1. Dependent variables

Both Crowdcube and Seedrs platforms use the “all or nothing” model, thus the firms don’t receive anything if they don’t get the target amount, regardless of whether they reached 1% or 99% of the target, or if they have a few or many investors. Additionally, the firms only receive the raised amount after the campaign is closed. So, as what matters for firms is to reach the target, we first select the dichotomous variable “Funded” as a measure of success, i.e., a campaign is successful if it raises an investment amount at least equal to its target. Later, to analyse the role of competition during the campaign, we use as dependent variables the daily investment amount and the daily number of investors in the campaign i.

3.3.2.2. Independent variables

Considering that one of the classical measures of competitive pressure is the number of competitors ([Vives, 2008](#)), we use the number of competing campaigns to test our first hypothesis, which is measured by the number of competing active campaigns at the same time in the equity crowdfunding platform ([Chen, 2021](#)). For instance, if there are ten active campaigns on the same day, the number of competitors is nine. Note that, although the effect of competition has not yet been properly studied in the context of equity crowdfunding, some authors have considered competition as a control variable. In such cases, competition is usually measured as the number of active campaigns ([J. Block et al., 2018](#); [Coakley et al., 2018](#); [Hornuf & Schwienbacher, 2018b](#); [Kleinert & Volkmann, 2019](#); [Signori & Vismara, 2018](#); [Vismara, 2018](#)). Moreover, as previous research shows that the first days are critical for campaigns’ success ([Hornuf & Schwienbacher, 2018b](#); [Vismara, 2018](#); [Vulkan et al., 2016](#)), we report the number of competing campaigns to the average during the first week

of the campaign. For robustness check, we also use the Herfindahl Hirschman Index (HHI) to measure the market concentration raised amount among projects (campaigns) in the same month.

In our second hypothesis, we assess the relevance of blockbuster projects (with many funders or that capture a large amount of funding) to the performance of equity crowdfunding campaigns. To capture only those projects that significantly outperformed the others, we classify as blockbuster those projects that simultaneously meet three conditions: (i) the percentage funded is higher than 200% of the target amount; (ii) represent at least 5% of the funding amount of all campaigns during a defined time window (from ninety days before the campaign starts until the end of the campaign); (iii) raised at least one million GBP. As the network effects of blockbuster projects are not limited to the period in which campaigns are active, but last over time ([Liu et al., 2015](#)), we use the number of Blockbuster projects in a time window that starts 90 days earlier than the campaign to be active on the platform and lasts until the end of the campaign. Under these conditions, we identified 26 blockbuster projects (20 on the Crowdcube platform and 6 on the Seedrs Platform), which represent 1.75% of all campaigns in our sample (4.8% of the amount raised by successful campaigns).

Previous research in reward crowdfunding defined blockbuster projects as those in the top 0.05% in terms of pledged amount across all the projects. Using this criterion, [Liu et al. \(2015\)](#) identified 93 projects from a sample of 190,845 projects and [Kim, Lee, Cho, and Lee \(2016\)](#) 61 projects from a sample of 148,398. However, we cannot use the same criteria, given the much lower size of our sample (1,487 campaigns) and the different characteristics of equity crowdfunding (legal limitations on the maximum amount of the offering and most entrepreneurs may not be willing to give up of the ownership majority), which determine that the equity crowdfunding market size is much smaller than reward crowdfunding and that the dispersion of the amount raised by equity crowdfunding campaigns is also smaller. In fact, in our sample, the campaign that raised the highest amount represented 1.41% of the raised amount by all the campaigns on both platforms²⁸. Thus, for robustness check, we simulated the use of two alternatives to select blockbuster projects: one more restrictive (at least 250% of the funding percentage) and the other less restrictive (at least 150% of the

²⁸ That is, if we used the same criterion that has been used for the reward crowdfunding model (top 0.05% in terms of pledged amount across all the projects), a single campaign will already exceed this amount.

funding percentage). Using these criteria, we could identify, respectively 15 and 38 blockbuster projects. However, the main results of the multivariate analysis remain similar²⁹. As the effects of blockbuster projects can be different for projects in the same category and projects in other categories (Liu et al., 2015), we defined two other variables: the number of all blockbuster projects in the same industry and the number of all blockbuster projects in other industries.

For assessing if our results are influenced by the delimitation of the market, we compare four dimensions of the relevant competitive equity crowdfunding market: (i) all the campaigns on the same platform; (ii) the campaigns on the same platform within the same industry; (iii) all the campaigns on both platforms (as a proxy of equity crowdfunding market in the UK³⁰); and (iv) the campaigns on both platforms within the same industry. Comparing the results of these four alternatives, we can assess whether the relevant competition is among the projects that search for funding on the same equity crowdfunding platform, if only to those projects belonging to the same industry or if all the projects seeking funding in the UK market.

While campaigns compete with each other's for funding, they are not perfect substitutes. For instance, they differ in terms of project and teams' quality, size, industry, and geography. Therefore, we control for the different characteristics of the campaigns by including in the model the control variables related to the success factors previously identified in the equity crowdfunding literature, such as variables related to (i) Signals of Project Quality (equity retention, presence of a large investor; firm age; firm value); (ii) Signals of Team Quality (information about qualifications and/or previous experience; team size); (iii) Information Disclosure (interactions between the team members and investors during the campaign – number of updates and number of Q&A); (iv) Other Motivations (tax reliefs and non-financial rewards) and (v) Early investments. The variables are described in *Table 13*.

²⁹ These results are not reported, but they are available by request.

³⁰ As indicated earlier, together Crowdcube and Seedrs facilitated 95% of the UK equity crowdfunding deals in 2019 (source: http://about.beauhurst.com/wp-content/uploads/2020/02/The-Deal-2019_WEB.pdf). Therefore, as our sample includes all the ECF campaigns on these two platforms between April 2015 and October 2018, our sample is a very good proxy for the entire UK Equity Crowdfunding market during this period.

Table 13 - List and definition variables

Label	Type of variable	Description
Competition Variables		
#Camp_platf	Numerical (>0)	Average number of competing campaigns on the same platform, during the first week of the campaign i.
#Camp_platf_ind	Numerical (>0)	Average number of competing campaigns of the same industry on the same platform, during the first week of the campaign i.
#Camp_market	Numerical (>0)	Average number of competing campaigns on the market (both platforms), during the first week of the campaign i.
#Camp_market_ind	Numerical (>0)	Average number of competing campaigns of the same industry on the market (both platforms), during the first week of the campaign i.
#BB_market	Numerical (>0)	Number of blockbuster projects on the market (both platforms) from any industry.
#BB_market_ind	Numerical (>0)	Number of blockbuster projects on the market (both platforms) from the same industry.
#BB_market_other ind	Numerical (>0)	Number of blockbuster projects on the market (both platforms) from other industries.
#BB_platf	Numerical (>0)	Number of blockbuster projects on the platform from any industry.
#BB_platf_ind	Numerical (>0)	Number of blockbuster projects on the platform from the same industry.
#BB_platf_other ind	Numerical (>0)	Number of blockbuster projects on the platform from other industries.
HHI	Numerical [0;1]	Herfindahl-Hirschman Index (HHI) – measure the concentration of raised amount among projects within the same month.
Campaigns Characterization		
Funded	Dummy	A campaign is funded if the raised amount is equal (or higher) to the target. The variable assumes 1 if campaign i is funded, and 0 otherwise.
Target amount	Numerical (>0)	Target funding amount of campaign i (thousands of GBP).
Equity retention	Numerical (0-100)	Percentage of equity retained [(1- equity offered)] of the campaign i.
Raised amount	Numerical (>0)	Raised amount until the last day of campaign i (thousands of GBP).
Raised (%)	Numerical (>0%)	Ratio between the raised and target amount of campaign i.
#Investors	Numerical (>0)	Number of investors on campaign i.
Large investor	Dummy	Presence of a large investor (with an investment equal to or higher than 20% of the target). The variable assumes 1 if the campaign i has a large investor, and 0 otherwise.
Highest investment	Numerical (>0%)	Ratio between the highest investment and target amount of campaign i.
Early investments	Numerical (>0%)	Ratio between the investment amount during the first week and the target amount of the campaign i.
#Updates	Numerical (≥0)	Number of updates about the project during the campaign i.
#Q&A	Numerical (≥0)	Number of Q&A during the campaign i.
Tax reliefs	Dummy	Qualification of the firm for tax relief (EIS or SEIS). The variable assumes 1 if the firm is eligible for tax relief, and 0 otherwise.
Non-financial rewards	Dummy	Presence of other non-financial rewards (beyond the shares of the company). The variable assumes 1 if there are non-financial rewards, and 0 otherwise.
Firm and Team Information		
Firm age	Numerical (≥0)	Age of the firm i (years).
Financial information	Dummy	Availability of historical and forecast financial statements of the firm. The variable assumes 1 if such information is available, and 0 otherwise.

Label	Type of variable	Description
Firm value	Numerical (>0)	Pre-money value of firm i (thousands of GBP).
Sales	Numerical (≥ 0)	Expected sales in the current year of firm i (thousands of GBP). (*)
Assets	Numerical (≥ 0)	Assets in the current year of firm i (thousands of GBP). (*)
Sales growth	Numerical (%)	Expected average annual growth rate (AAGR) of sales between year $n+2$ and $n-1$ (when sales of year $n-1$ are available, it is used sales of year n). (*)
EBITDA margin	Numerical ($>0\%$)	Expected EBITDA margin (EBITDA/Sales) in the current year. (*)
Qualification/ Experience	Dummy	Availability of information about qualifications and/or previous professional experience of the first team member. The variable assumes 1 if such information is available, and 0 otherwise.
Team size	Numerical (>0)	Number of project team members of the campaign i .

(*) Only available for campaigns in Crowdcube.

3.4. Descriptive analysis

3.4.1. Campaigns characterization

Table 14 shows the descriptive statistics³¹. During the first week, on average, 29 competing campaigns are active on the same platform (ranging from 8 to 51 campaigns) and 57 on both platforms. Considering only projects in the same industry, these numbers are reduced to 4 and 8, respectively. During the time window defined, the maximum number of blockbuster projects on both platforms is 6, 3 in the same industry and 6 in other industries. For the same platform, those numbers are reduced to 4, 3 and 4, respectively.

Of the 1,487 campaigns in our sample, 53% (783) were successful, i.e., achieved the target amount. The target amount of each campaign ranges from £17 thousand to £6 million and the stake of equity retained by entrepreneurs is always bigger than 50% (average of 89%). The effective highest amount raised for one campaign was almost £7.3 million (note that campaigns can accept a higher amount of funding than the target). The campaign that proportionally gets more funded, raised more than fifteen times the target amount. The average number of investors per campaign is 239, but 54 campaigns have more than 1,000 investors (maximum of 3,709 investors).

Around 53% of the campaigns have a large investor (who invest at least 20% of the target amount) and the highest investment in a campaign is, on average 27% of the target. Early investments (investments during the first week of the campaign) represent, on average, 50% of the target amount.

Each campaign is usually active (online) for 60 days in Seedrs and 30 days (or 45, until July 2015) in Crowdcube. However, some campaigns close sooner, while others extend the campaign for more days. In our sample, on average the campaigns were active for 45 days (between 1 and 132 days).

³¹ The pairwise correlation matrix is presented in *Appendix 1*.

During the campaign, the team may interact with investors by giving updates on the campaign or answering the questions posted by investors. Some teams are very active and keep the campaign constantly updated, while others do not use this possibility. On average, each campaign has 8 updates and 13 questions posted by investors.

Investors in the United Kingdom may benefit from tax relief when investing in start-ups. There are two tax breaks: EIS (Enterprise Investment Scheme) and SEIS (Seed Enterprise Investment Scheme). Both tax schemes aim to help small and high-risk firms raise finance by offering tax relief on new shares. In our sample, almost all the firms are qualified for one of these tax reliefs (85%). To attract more investors, some campaigns also offer other rewards to investors. In fact, in our sample around half of the campaigns (52%) offer other non-financial rewards.

Almost all the firms with campaigns in Crowdcube are from the United Kingdom, however, in Seedrs the campaigns from other countries are more frequent³².

The firms with equity crowdfunding campaigns on Crowdcube and Seedrs platforms are in general young, small and with negative profitability. On average, the firms are three years old. Around 60% of the firms are young (less than 3 years) and 18% are older than 5 years. The average pre-money valuation of the firms is £4 million, but it ranges from £80 thousand to £104 million.

The financial information (balance sheet and income statement: historical and forecast) is only available for some firms on the Crowdcube platform³³ (representing only 23% of firms from our sample). As expected for start-ups, the firms in the sample are small (average sales of £1.3 million and average assets of £578 thousand), have negative profitability (average EBITDA margin is -806%) and have exponential expected growth rate (the mean of the AAGR of sales is 214,489%).

³² In our sample, there are campaigns from 20 different countries (Appendix 2) and around 60% of them are concentrated in three industries (Appendix 3): Information and communication (28%); Wholesale and retail trade (17%) and Manufacturing (15%).

³³ Until June of 2017, many of the Crowdcube campaigns provided historic and forecast financial statements (profit and loss statement, balance sheet and cash flow statement). However, since then, such information is no longer available to the general public, except in some cases upon request directly to the founders.

The firm teams have between 1 and 27 members (5, on average). In 73% of the campaigns, the information about the qualifications and/or experience of the first member of the team is available.

Table 14 - Descriptive statistics (all campaigns).

All variables are described in Table 13.

Variable	Unit	N	Mean	SD	Min	Max
Competition (average for the first week)						
#Camp_platf	Number	1,407	28.72	8.89	7.86	51.29
#Camp_platf_ind	Number	1,374	4.17	3.72	0.00	17.29
#Camp_market	Number	1,407	56.60	11.60	28.57	83.00
#Camp_market_ind	Number	1,374	8.03	6.39	0.00	30.43
#BB_market	Number	1,407	2.26	1.38	0.00	6.00
#BB_market_ind	Number	1,374	0.24	0.57	0.00	3.00
#BB_market_others ind	Number	1,374	2.01	1.31	0.00	6.00
#BB_platf	Number	1,407	1.22	1.11	0.00	4.00
#BB_platf_ind	Number	1,374	0.13	0.41	0.00	3.00
#BB_platf_others ind	Number	1,374	1.09	1.07	0.00	4.00
Campaigns Characterization						
Funded	Dummy (Yes=1/No=1)	1,487	0.53	0.50	0.00	1.00
Target amount	Thousands of GBP	1,487	326	373	17	6,000
Equity retention	% Equity	1,487	0.89	0.06	0.50	0.99
Raised amount	Thousands of GBP	1,487	348	593	60	7,290
Raised (%)	% Target	1,487	0.98	0.86	0.00	15.07
#Investors	Number	1,487	239	352	4	3,709
Large investor	Dummy (Yes=1/No=1)	1,254	0.53	0.50	0.00	1.00
Highest investment	% Target	1,254	0.27	0.40	0.00	9.78
Early investments	% Target	1,487	0.50	0.54	0.00	10.71
Campaign duration	Number	1,487	45	20	1	132
#Updates	Number	1,138	8	8	0	56
#Q&A	Number	1,139	13	14	0	140
Tax reliefs	Dummy (Yes=1/No=0)	1,487	0.85	0.36	0.00	1.00
Non-financial rewards	Dummy (Yes=1/No=0)	1,438	0.52	0.50	0.00	1.00
Firm and Team Information						
Firm age	Years	1,487	3.32	3.52	-0.23	46.39
Financial information	Dummy (Yes=1/No=0)	1,483	0.23	0.42	0.00	1.00
Firm value	Thousands of GBP	1,487	4,243	8,394	80	104,000
Sales	Thousands of GBP	323	1,312	2,561	0	29,616
Assets	Thousands of GBP	316	578	1,347	-2	12,274
Sales growth	% (AAGR)	247	2,145	25,546	0	400,000
EBITDA margin	% Sales	323	-8.06	125.74	-2,258.82	0.36
Qualification/Experience	Dummy (Yes=1/No=0)	1,454	0.73	0.44	0.00	1.00
Team size	Number	1,445	4.88	2.52	1.00	27.00

3.4.2. Comparison between successful and unsuccessful campaigns

Table 15 compares the descriptive statistics between successful and unsuccessful campaigns. The average number of competing campaigns during the first week is significantly lower for successful campaigns (when we considered all the campaigns on the same platform or the successful campaigns in both platforms and the same industry), which is a signal that the number of competing campaigns can influence the campaigns' likelihood of success. The presence of blockbuster projects also seems to be relevant to the success of campaigns, but only when we distinguish between blockbuster projects within the same industry and from other industries. The sign is positive for the presence of blockbuster projects in the same industry and negative for both the presence of blockbuster projects from other industries, suggesting the existence of a spillover effect of the blockbuster projects within the same industry, and the "cannibalization" effect of the projects from other industries.

These results are confirmed when we analyse the probability of a campaign being successful according to the number of competing campaigns. As we can see in **Table 16**, the probability of being successful is higher when there is a small number of active campaigns. For instance, for the group of campaigns in which the average number of active campaigns during its first week is lower than 20, the percentage of successful campaigns is 59.9%, while for campaigns with 41 or more competing campaigns, such percentage decreases to 44.7%³⁴.

As expected, the raised amount, the percentage of the raised amount and the number of investors are much higher for successful campaigns. In fact, with exception of non-financial rewards, the other variables of campaign characterization are significantly different between successful and unsuccessful campaigns. However, among the variables regarding the firm and team information, only firm value, assets, qualifications/experience information and team size reveal the existence of significant differences between the two groups.

³⁴ The results are similar if we measure the competition by considering the number of active campaigns on the first day of the campaign or during the campaign duration.

Table 15 - Descriptive statistics (funded versus not funded campaigns)

This table reports the descriptive statistics (number of observations and mean) for successfully and unsuccessfully campaigns and the t-tests on the differences between the two groups of campaigns. All variables are described in Table 13.

Variable	Unit	Funded (Successful)		Not Funded (Unsuccessful)		Mean Difference (t-test)
		N	Mean	N	Mean	
Competition (average for the first week)						
#Camp_platf	Number	740	27.93	667	29.59	-1.66***
#Camp_platf_ind	Number	730	3.94	644	4.44	-0.49**
#Camp_market	Number	740	56.18	667	57.06	-0.88
#Camp_market_ind	Number	730	7.71	644	8.39	-0.68**
#BB_market	Number	740	1.15	667	1.28	-0.08
#BB_market_ind	Number	730	0.13	644	0.11	0.06
#BB_market_other ind	Number	730	1.02	644	1.16	-0.14*
#BB_platf	Number	740	0.6	667	0.70	-0.03
#BB_platf_ind	Number	730	0.08	644	0.05	0.07***
#BB_platf_other ind	Number	730	0.52	644	0.65	-0.11*
Campaigns Characterization						
Target amount	Thousands of GBP	783	361	704	287	74***
Equity retention	% Equity	783	0.90	704	0.87	0.02***
Raised amount	Thousands of GBP	783	567	704	105	462***
Raised (%)	% Target	783	1.56	704	0.33	1.23***
#Investors	Number	783	387.98	704	72.87	315.11***
Large investor	Dummy (Yes=1/No=1)	719	0.73	535	0.27	0.46***
Highest investment	% Target	719	0.37	535	0.14	0.23***
Early investments	% Target	783	0.75	704	0.22	0.53***
#Updates	Number	656	10.42	482	5.78	4.64***
#Q&A	Number	654	17.09	485	7.44	9.64***
Tax reliefs	Dummy (Yes=1/No=0)	783	0.87	704	0.83	0.04*
Non-financial rewards	Dummy (Yes=1/No=0)	768	0.54	670	0.50	0.04
Firm and Team Information						
Firm age	Years	783	3.31	704	3.33	-0.02
Financial information	Dummy (Yes=1/No=1)	783	0.24	700	0.22	0.02
Firm value	Thousands of GBP	783	5315	704	3,051	2265***
Sales	Thousands of GBP	178	1351	145	1,264	87
Assets	Thousands of GBP	177	706	139	415	291*
Sales growth	% (AAGR)	139	3,280	108	684	2,597
EBITDA margin	% Sales	178	-0.92	145	-16.83	15.92
Qualif/Experience	Dummy (Yes=1/No=1)	768	0.71	686	0.75	-0.04*
Team size	Number	768	5.24	677	4.46	0.78***

Table 16 - Probability of success according to the average number of active campaigns during the first week

Average number of active campaigns during the first week of the campaign i	<20	21-30	31-40	≥41	n.a.	TOTAL
Unsuccessful	95	234	254	84	37	701
Successful	142	291	239	68	43	795
Total	237	525	493	152	80	1,487
% Successful campaigns	59.9%	55.4%	48.5%	44.7%	53.8%	52.1%

3.5. Multivariate analysis

In this section, we analyse the role of competition in equity crowdfunding campaigns. First, we explore the effect of competition on the outcome at the end of the campaign (funded or not funded). Then, we analyse the role of competition during the campaign.

3.5.1. Competition effect on campaign success

To analyse the competition effect on fundraising success, we use a logistic regression, where the dependent variable is a dummy variable for success: funded. *Table 17* reports the results of logistic regressions for the competition effect on fundraising success. Model (1) to (4) includes only the variables related to competition (number of competing campaigns, number of blockbuster projects), during the first week of the campaign. Models (5) to (8) also control for other variables that, according to the literature review, influence fundraising success. The models also differ in terms of the definition of relevant competitive market: all the campaigns on the same platform for models (1) and (5); campaigns on the same platform within the same industry for models (2) and (6); all the campaigns on both platform for models (3) and (7) and campaigns on both platform within the same industry for models (4) and (8).

Model (1) assesses the competition effect on fundraising success, and it only includes the variables related to competition among all the campaigns on the same platform. According to this model, the success of the campaign is negatively influenced by the number of competing campaigns (other active campaigns on the same platform during the first week of the campaign), but not by the presence of blockbuster projects. When we restrict the competing campaigns to those on the same platform and within the same industry (model 2), the number of competing campaigns remains to negatively influence the likelihood of campaign success and the variables related to the presence of blockbuster projects to become also significant, but with opposite signs depending on whether they are blockbuster projects from the same industry (positive) or other industries (negative). If we expand the relevant competitive market to both platforms (models 3 and 4), we have similar results, except for the number of competing campaigns in model (3). This way, we observe that the presence of blockbuster projects from the same industry has a positive and significant impact on the

probability of the project being funded and the presence of blockbuster projects from other industries reduces such probability suggesting, as expected, the existence of positive spillovers effects from the blockbuster projects on the same industry and a cannibalization effect from the blockbuster projects on other industries.

However, models (1) to (4) ignore a set of determinants of campaign success previously identified by the literature and the quality of the models is relatively low. Thus, in models (5) to (8), we add a set of variables related to project quality, team quality, information disclosure, early investments, and other motivations. These models vary according to the variables used to assess the effect of competition. In Model (5) the competitors are the campaigns running on the same platform during the first week of the campaign i . In Model (6) the competitors are restricted to the campaigns from the same industry and platform. Model (7) expand the notion of competitors to all the campaigns running on both platforms (Crowdcube and Seeds) during the first week of the campaign and model (8) includes the campaigns from the same industries on both platforms.

Our results suggest that, even if individually the number of competitors may have some effect on campaigns' success, when we control for other determinants, such effect is no longer significant (restricted to the campaigns of the same industry or not). Thus, contrary to previous empirical evidence in other crowdfunding models, such as microfinance ([Ly & Mason, 2012](#)) or donation ([Meer, 2014](#)), our results do not support our first hypothesis, namely that the higher the competitive intensity of equity crowdfunding platforms, the lower the probability of a campaign being successful.

Regarding our second hypothesis, we find that even controlling for other variables related to the success of equity crowdfunding campaigns, the presence of blockbuster projects continues to have a significant negative effect on the likelihood of a campaign being successful. The negative effect is observed not only when we include only the blockbuster projects from the other industries (models 6 and 8), but also when we include the total number of blockbuster projects from any industry (models 5 and 7), suggesting that the “cannibalization effect” of the projects from other industries is more relevant the positive spillover effect of blockbuster projects within the same industry. Indeed, the presence of

blockbuster projects from the same industry is not significant neither for the campaigns of the same platform (model 6) nor for campaigns from both platforms (model 8).

Therefore, we do not find evidence that the presence of blockbuster projects in the same category has a positive spillover effect on projects of the same category (hypothesis H2a), but we observe a cannibalization effect of the project from the other industries, following our Hypothesis H2b. Thus, following previous evidence on the reward crowdfunding model [Liu et al. \(2015\)](#), the presence of blockbuster projects seems to intensify the market competition and capture the attention and resources of backers that otherwise could invest in projects from other categories.

Table 17 - The effect of competition on the success of ECF

This table reports logistic regressions for the effect of competition on fundraising success. The dependent variable assumes the value of 1 if the campaign is successful (funded) and 0, otherwise. Model (1) to (4) includes only the variables related to competition (number of competing campaigns, number of blockbuster projects) during the first week of the campaign. Models (5) to (8) also control for other variables that, according to the literature review, influence fundraising success. The models also differ in terms of the definition of relevant competitive market: all the campaigns on the same platform for models (1) and (5); campaigns on the same platform within the same industry for models (2) and (6); all the campaigns on both platform for models (3) and (7) and campaigns on both platform within the same industry for models (4) and (8). All the variables are defined in **Table 13**. Standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1) Funded	(2) Funded	(3) Funded	(4) Funded	(5) Funded	(6) Funded	(7) Funded	(8) Funded
#Camp_platf	-0.021*** (0.006)				0.001 (0.011)			
#BB_platf	-0.010 (0.048)				-0.191** (0.093)			
#Camp_platf_ind		-0.035** (0.015)				0.000 (0.027)		
#BB_platf_ind		0.410*** (0.146)				0.334 (0.252)		
#BB_platf_other ind		-0.087* (0.051)				-0.266*** (0.097)		
#Camp_market			-0.006 (0.005)				0.024*** (0.008)	
#BB_market			-0.033 (0.039)				-0.128* (0.074)	
#Camp_market_ind				-0.016* (0.009)				0.000 (0.015)
#BB_market_ind				0.172* (0.098)				0.088 (0.167)
#BB_market_other ind				-0.071* (0.042)				-0.132* (0.078)
Equity retention					3.623** (1.592)	3.698** (1.604)	3.469** (1.580)	3.638** (1.595)
Large investor					1.251*** (0.196)	1.299*** (0.199)	1.255*** (0.197)	1.295*** (0.198)
Firm age					-0.059** (0.029)	-0.063** (0.029)	-0.061** (0.028)	-0.065** (0.029)
Firm value					-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Team size					0.035 (0.042)	0.039 (0.042)	0.031 (0.042)	0.044 (0.042)
Qualification/Experience					0.078 (0.239)	0.158 (0.243)	-0.186 (0.238)	-0.027 (0.236)
#Updates					0.100*** (0.016)	0.101*** (0.016)	0.102*** (0.016)	0.098*** (0.016)
#Q&A					0.073*** (0.013)	0.074*** (0.014)	0.079*** (0.014)	0.075*** (0.014)
Tax reliefs					0.226 (0.286)	0.235 (0.292)	0.222 (0.288)	0.225 (0.292)
Non-financial rewards					0.235 (0.220)	0.235 (0.222)	0.109 (0.213)	0.109 (0.214)
Early investments					6.109*** (0.529)	6.022*** (0.530)	6.100*** (0.530)	5.979*** (0.527)
Observations	1,407	1,374	1,407	1,374	1,103	1,081	1,103	1,081
Pseudo R ²	0.0063	0.0095	0.0014	0.0055	0.5108	0.5096	0.5149	0.5049
Log-likelihood	-967.22	-940.67	-971.98	-944.43	-365.85	-358.92	-362.85	-362.41

For robustness check, we performed several simulations. First, we replicate the analysis using different measures of success. Instead of using a dichotomous variable (funded or not), we use as a dependent variable the total number of investors in the campaign and the percentage raised (percentage of the target amount that the campaigns raised)³⁵. The results (see **Appendix 4** and **Appendix 5**) are similar for the regressions on the percentage raised (controlling for other determinants of equity crowdfunding success, the number of competing campaigns is not significant and the presence of blockbuster projects from other industries has a negative effect on the likelihood of a campaign being funded, even if only for the campaigns from the same platform), but we can identify some relevant differences on the determinants of the number of investors. The number of competing campaigns has a negative and significant influence on the number of investors of the equity crowdfunding campaign (as expected in our first hypothesis), even when controlling for other determinants of success. We also observe that number of blockbuster projects from the same industry has a significant and positive influence on the number of investors, while the number of blockbuster projects is no longer significant. These results suggest that blockbuster projects attract new investors to the platform, creating some spillover effects on projects of the same categories (in accordance with our hypothesis H2a), but such effect is not enough for the campaign being funded (as observed in the logistic regression). A probable explanation is that new investors from other campaigns in the same industry invest small amounts that are not enough to have a significant impact on the campaign's likelihood of success. In any case, this result requires further investigation.

Second, we also use the Herfindahl Hirschman Index (HHI) to measure the market concentration raised amount among projects (campaigns) in the same month (see **Appendix 6**). However, once again, we can only confirm our hypothesis H2b, about the cannibalization effect of the Blockbuster projects from other industries.

³⁵ We also simulate the use of two different periods to measure the variables related to competition (the first day and the average for all the period of campaign duration, instead of the average during the first week of the campaign). The results (not reported, but available by request) are quite similar and do not change the main conclusions.

3.5.2. Other determinants of campaign success

To test the influence of project quality on the success of equity crowdfunding campaigns, we use four variables: equity retention, the presence of a large investor, firm age and economic potential of the project/firm (firm value). The coefficient of the equity retention variable is positive and statistically significant in all models. Our results are in line with previous research on equity crowdfunding ([Ahlers et al., 2015](#); [Vismara, 2016](#); [Vulkan et al., 2016](#)) and confirm that equity retention signals the project quality and positively influences the success of the equity crowdfunding campaign. As expected, the presence of a large investor³⁶ increases the probability of the equity crowdfunding campaign being successful. As [Hornuf and Schwienbacher \(2018b\)](#) and [Vulkan et al. \(2016\)](#), our results suggest that the presence of a large investor (usually a sophisticated or, at least, a more informed investor) is a valuable signal to undecided investors. Contrary to previous research ([Ahlers et al., 2015](#); [Belleflamme et al., 2014](#)), our results suggest that firm age influences significantly the success of equity crowdfunding campaigns, and younger firms have a higher likelihood of being funded in equity crowdfunding campaigns. Finally, we do not find evidence that the economic potential of the project/firm influences the investment decision. Although the coefficient of the variable firm value is significant, its sign (negative) is not aligned with our expectations. A probable explanation for this evidence is that investors may suspect that firms with a higher valuation are overvalued (and consequently the share price is too high) discouraging them from investing in such campaigns.

The team quality is measured, in our model, by two variables: team size and availability of information about qualifications or previous experience. However, contrary to previous empirical research ([Ahlers et al., 2015](#); [Vismara, 2016](#)), we do not find evidence that team size influences significantly the success of the campaigns. The information about team qualifications and previous experience is not always available, because the team members have the option to disclose or not such information and, even when they do it, that information is not always displayed in the same way, which makes it difficult to use for statistical purposes. So, as they probably only decide to disclose such information if they

³⁶ We define a large investor as one who invests at least 20% of the target amount. In our sample, 44% of the campaigns have a large investor, according to this definition. Although the 20% trigger can be seen as an aleatory value, the main conclusions remain valid when we use other triggers (ex: 30%, 40%, 50%).

have high qualifications and/or previous experience (in the industry or as entrepreneurs) is relevant, we use the availability of such information as a proxy of team quality. However, contrary to previous research ([Ahlers et al., 2015](#); [Piva & Rossi-Lamastra, 2018](#)) which finds significant empirical evidence that human capital is positively related to the success of equity crowdfunding campaigns, we do not find empirical evidence that the availability of information about qualifications and/or previous experience influences the success of equity crowdfunding campaigns. This can be related to the fact that only 27% of the campaigns do not disclose this information, which may bias the statistical results³⁷.

To evaluate the influence of information disclosure on the success of equity crowdfunding campaigns we use two variables related to the interactions between team members and investors during the campaign - the number of updates and the number of Q&A. The coefficients associated with both variables are positive (as expected) and statistically significant. This way, consistently with prior research ([Hornuf & Schwiendbacher, 2015](#); [Kuppuswamy & Bayus, 2014](#); [Mollick, 2014](#)) we find empirical evidence that the success of an equity crowdfunding campaign is positively influenced by the number of interactions between entrepreneurs and investors during the campaigns. Two reasons may contribute to this result. First, both types of interactions (updates and Q&A) contribute to reducing information asymmetry. Second, the campaigns that catch more attention from potential investors (for example, because there are focused on innovative products) are more likely to be able to be funded. In addition, investors like to get effective and fast responses, and if that happens, as the dates and responses are visible on the platform, more investors are likely to raise questions and therefore have an interest in investing.

The success of an equity crowdfunding campaign seems not to be significantly influenced by the existence of tax reliefs or non-financial rewards. These results are aligned with previous research on equity crowdfunding about the impact of tax incentives ([Vismara, 2016](#); [Vulkan et al., 2016](#)) and non-financial motives ([Cholakova & Clarysse, 2015](#); [Vismara, 2016](#)) on

³⁷ The previous literature uses as proxies of human capital other variables, such as the percentage of MBA graduates among executive board members of a founding team ([Ahlers et al., 2015](#)) or entrepreneurs' business education and entrepreneurial experience ([Piva & Rossi-Lamastra, 2018](#)). However, unluckily such team information in Seedrs and Crowdcube is not always available, and even if available it is dispersed and difficult to standardize. Thus, given the sample size of our paper, it would be impracticable to hand collect such information from other sources, such as LinkedIn profiles of each team member of the 1,487 campaigns (remember that the average team size is 4.88).

investors' decisions. This way, we cannot confirm that investors decide their investments depending on the existence of tax reliefs or other non-financial rewards.

To test the effect of early investments on fundraising success, as Vulkan et al. (2016), we use the variable “percentage funded until the end of the first week” in our analysis. As stated by other empirical studies on equity crowdfunding ([Hornuf & Schwiendbacher, 2015](#); [Vismara, 2018](#); [Vulkan et al., 2016](#)), our results confirm that fundraising success is positively influenced by early investments, suggesting the existence of a herding behaviour of investors.

Overall, except for team quality signals, our results are in accordance with previous research on other determinants of equity crowdfunding campaigns' success.

3.5.3. The effect of competition during the campaign

Until now, we analyse the effect of competition on the outcomes at the end of the campaign (raised or not, the total number of investors, and the percentage raised). However, which is the impact of competition variables during the campaign? How does it influence the investment amount and number of investors captured daily by a campaign? These are the questions that we will try to answer in this section. So, using the daily observations of each campaign, we construct several panel data models to analyse the effect of competition variables on the daily investment amount and the daily number of investors. Our sample comprises 66,180 daily observations of the 1,487 campaigns run on Crowdcube and Seedrs platforms between April 7, 2015, and October 13, 2018.

As in the previous static analysis, we test the influence of the number of competitive campaigns, and the number of blockbuster projects and we use different definitions of the relevant competitive market (campaigns that are active at the same time, on the same platform or both platforms, and considering all the campaigns on the platform or just the campaigns from the same industry). As we are only interested in analysing the impact of variables related to competition (that vary over time), we use a fixed effect panel model that controls for time-invariant characteristics of each campaign (firm age, firm value, equity retention, presence of a large investor, number of team members, industry, etc.). Nevertheless, we performed the Hausmann test (not reported), which confirmed that the

fixed-effect model performs better than the random model. Anyway, we control for other time-variant variables, such as the total amount raised in the platform on such day and the total number of investments on day t . As proposed by Lin, Lee and Yin (2018), we also included the variables related to the dynamics of projects' competitiveness, namely the funding progress towards the goal (accumulated percentage raised until day t) and temporal progress of the campaign (middle period of the campaign - dummy variable that assumes 1 if the campaign is not within in the first seven days or less than seven days of the end of the campaign; and 0 otherwise). We report the results of the models in **Table 18**.

The models vary according to the dependent variable used [daily investment amount on campaign i for Models (9) to (12) and the daily number of investors in campaign i for models (13) to (16)]. Despite all models using variables related to competition effects (number of competing campaigns, number of blockbuster projects), they differ in the definition of relevant competitive market. Models (9) and (13) use all the campaigns in the same platform; models (10) and (14) all the campaigns in both platforms, models (11) and (15) the campaigns in the same platform and same industry and models (12) and (16) the campaigns of both platforms and same industry.

All the models suggest that the number of competitors (competing campaigns) negatively influences the daily investment amount and the daily number of investors of the campaign. These results are very consistent and robust, suggesting that even if the competition effect on the result of each campaign is not very clear, day by day, the number of competitors has a relevant role in the campaign performance. Moreover, such effects are still strong when we use the competitors of both platforms, and when we restrict the definition of competitors to the campaigns of the same industry. These results suggest that the relevant competition is not limited to the platform where the campaign is running but each campaign competes with all the campaigns that are running in the market, regardless of the platform and industry of the firm.

However, as opposed to the evidence found in the static analysis for the outcome of the campaign (funded or not), the relevance of blockbuster projects on the dynamics of the campaign (daily number of investments and the daily investment amount raised) is not so clear. We only find evidence of the significant positive influence of blockbuster projects from the same industry on the same platform for the daily number of investors. The

cannibalization effect of the blockbuster projects of other industries is not significant. However, this result may be influenced by the fact that the effects of blockbuster projects last over time, making it more difficult to capture and highlight this effect in a daily analysis.

Table 18 - The impact of competition on daily investment amount and daily number of investors of the campaign

Models (9) to (16) use the Panel Data Model Fixed-Effect. The dependent variable is the daily investment amount on campaign *i* for Models (9) to (12) and the daily number of investors in campaign *i* for models (13) to (16). All the models include variables related to competition on each day of the campaign (number of competing campaigns, number of blockbuster projects), but differ by the definition of the relevant market (all the campaigns on the same platform for models (9) and (13); campaigns on the same platform within the same industry for models (10) and (14); all the campaigns on both platform for models (11) and (16) and campaigns on both platform within the same industry for models (12) and (16)). All regression models also control for the total daily amount raised and the total number of investments on the platform, but coefficients are not reported. All the variables are defined in **Table 13**. Standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	(9) Daily Amount	(10) Daily Amount	(11) Daily Amount	(12) Daily Amount	(13) Daily N° Investors	(14) Daily N° Investors	(15) Daily N° Investors	(16) Daily N° Investors
#Camp_platf	-0.228*** (0.067)				-0.151*** (0.025)			
#BB_platf	-0.108 (0.738)				0.419 (0.278)			
#Camp_platf_ind		-0.456** (0.203)				-0.274*** (0.086)		
#BB_platf_ind		3.342 (2.307)				2.286** (0.986)		
#BB_platf_other ind		-0.002 (0.795)				0.466 (0.339)		
#Camp_market			-0.120*** (0.039)				-0.090*** (0.015)	
#BB_market			-0.415 (0.462)				0.067 (0.173)	
#Camp_market_ind				-0.227* (0.138)				-0.136*** (0.053)
#BB_market_ind				0.152 (1.735)				0.685 (0.660)
#BB_market_other ind				0.024 (0.525)				0.310 (0.200)
Middle Period of the Campaign	-11.498*** (0.571)	-11.143*** (0.587)	-11.537*** (0.571)	-11.456*** (0.602)	-5.381*** (0.215)	-5.468*** (0.250)	-5.396*** (0.215)	-5.550*** (0.230)
Acum. Percentage raised	-12.023*** (1.002)	-8.519*** (1.054)	-11.995*** (1.003)	-9.159*** (1.061)	-4.675*** (0.377)	-4.685*** (0.449)	-4.640*** (0.377)	-4.821*** (0.405)
Observations	58,589	44,958	58,717	50,963	60,248	46,231	60,379	52,448
Pseudo R ²	0.011	0.010	0.012	0.009	0.016	0.014	0.016	0.015
Number of campaigns	1,407	1,257	1,407	1,329	1,407	1,257	1,407	1,329

3.6. Conclusions and future research

This paper explores the effect of competition on the fundraising success of campaigns in equity crowdfunding, using a unique and large hand-collected database from the two major platforms of equity crowdfunding in the United Kingdom (Seedrs and Crowdcube) for the period between 2015 and 2018. Our main goal is to analyse the effect of competition in equity crowdfunding campaigns. However, according to the literature review, we also control for the relevance of the project and team characteristics, information disclosure, other motivations, and early investment in the probability of success of the equity crowdfunding campaigns.

In addition to contributing to a better understanding of equity crowdfunding in general, our study provides some useful indications to entrepreneurs and platforms to ensure a higher probability of success of their campaigns. We do not find evidence supporting our first hypothesis that the number of competing campaigns influences the likelihood of a campaign being funded, but we cannot say also that the number of competitors is entirely irrelevant. We find evidence that day by day, the number of competitors plays a relevant role in the campaign performance, both in terms of the number of investors and the amount raised. Moreover, the number of competing campaigns has a significant negative effect on the total number of campaign investors at the end of the campaign. We also find evidence that the presence of blockbuster projects has a cannibalization effect on the campaigns of other industries, stealing investors and reducing the probability of a campaign being successful.

This way, the competitive environment can influence the definition of the best strategy for entrepreneurs to enhance the probability of success of equity crowdfunding campaigns, including the decision about the best time for starting or exiting the campaign and how to capture the attention of potential funders.

Although our study contributes to a better understanding of equity crowdfunding, exploring for the first time the role of competition in this market, we recognize that it has some limitations, and we can identify some avenues for future research.

First, our sample includes only public campaigns available to general investors. However, in addition to the Crowdcube and Seedrs platforms not accepting all the campaigns that request funding, they also allow campaigns to be previously launched in private mode, to get a minimum investment amount before they are released to the public and, this way, showing to be more attractive. Thus, as the sample only includes the pre-selected campaigns, our results could be skewed, depending on which criteria are used by the platforms to reject the campaign before being publicized on the public site. However, we believe this is not a major problem because, according to information provided by the platforms, they just confirm some basic legal, financial and compliance information before accepting the campaigns, as well as give some suggestions to improve the success of the campaign. Nevertheless, further research can focus on the analysis of which factors most influence the pre-selection of the campaigns by the platforms, as well as the competition before the campaigns became public.

Second, our research limits competition in the equity crowdfunding market. However, those who invest in equity crowdfunding may also invest in venture capital or other markets. This way, future research may use a broader definition of competition that includes other markets.

4. HOW RELEVANT IS THE SUCCESS OF THE FIRST ECF CAMPAIGN TO THE FIRM'S FUTURE PERFORMANCE?

4.1. Introduction

The research on Equity Crowdfunding (hereafter ECF) has been mostly dedicated to the study of the factors that influence fundraising success. However, in recent years, some empirical studies have emerged on the post-campaign outcomes of firms that participate in equity crowdfunding campaigns ([Bouaiss et al., 2020](#); [Butticè et al., 2020](#); [Coakley et al., 2021](#); [Cumming, Meoli, et al., 2019](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#); [Walthoff-Borm, Vanacker, et al., 2018](#)). The post-campaign outcomes could be positive or negative. A positive outcome is achieved when companies survive and obtain subsequent rounds of financing or deliver an exit opportunity to crowdfunding investors (in the form of an IPO or M&A transaction). A negative outcome is when companies fail, i.e., when they become insolvent, start insolvency proceedings, or are dissolved after the ECF campaign.

Some previous empirical research explores the relationship between ECF financing and their ability to obtain subsequent rounds of financing, i.e., their capacity to attract Venture Capitalists (VC) or Business Angels (BA) investors ([Butticè et al., 2020](#); [Cumming, Meoli, et al., 2019](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)) or to carry out follow-on ECF campaigns ([Coakley et al., 2021](#)) after the first ECF campaign.

Another branch of research on the post-campaign outcomes of firms involved in ECF campaigns explores the relationship between ECF financing and firm bankruptcy using samples of firms with successful ECF campaigns to compare failure rates with firms that use other sources of financing ([Bouaiss et al., 2020](#); [Walthoff-Borm, Vanacker, et al., 2018](#)) and to analyse the factors that influence failure rates of crowdfunded firms.

Our research is also focused on post-campaign outcomes of firms involved in ECF campaigns, namely follow-on funding, and firm failure. Although, this paper extends previous research in several ways. First, to our knowledge, this is the first research that compares successful and unsuccessful firms in ECF in terms of their post-campaign

outcomes. Previous research ([Bouaïss et al., 2020](#); [Cumming, Meoli, et al., 2019](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)) relies only on successful equity crowdfunded firms. For instance, [Walthoff-Borm, Vanacker, et al. \(2018\)](#) find that ECF firms have a higher failure rate (8.5 times) than non-ECF firms, but they compare firms financed by ECF with firms that raised capital through other sources of capital. Others compare the probability of bankruptcy between equity crowdfunded firms with venture capital funded firms ([Bouaïss et al., 2020](#)) or the ability of firms to attract VC financing between crowdfunded firms and firms that did not receive any external seed financing or are angel-backed ([Butticè et al., 2020](#)). However, in none of these studies the samples include firms that searched for ECF but were unsuccessful. Therefore, previous works tell us nothing about what happens to firms that are not successful in ECF campaigns. The inclusion in the sample of firms with unsuccessful ECF campaigns also allows the comparison of the post-campaign outcomes of the two groups of firms (the firms that were successful in their first ECF campaign with those that were unsuccessful).

Second, as our sample includes all the campaigns launched on the two largest ECF platforms in the UK between April 2015 and October 2018, avoiding any selection bias related to the unsuccess of campaigns or crowdfunded firms that went to bankruptcy and subsequently suppressed from platforms databases.

Third, we also use a much larger dataset of ECF campaigns than previous studies. Our full sample includes 950 firms³⁸, while the sample used in previous research is much lower. For instance, [Signori and Vismara \(2018\)](#) use a sample of 212 UK companies from the Crowdcube platform, [Bouaïss et al. \(2020\)](#) analyse a sample of 277 French ECF-funded firms and 220 VC-funded firms, and [Hornuf et al. \(2018\)](#) investigate a sample of 270 UK firms and 143 German firms and [Walthoff-Borm, Vanacker, et al. \(2018\)](#) conduct their research on a sample of 277 UK companies.

³⁸ Our original sample includes 1,329 companies (1,471 campaigns) from Crowdcube and Seedrs. However, we use propensity score matching to overcome potential endogeneity and self-selection problems and to ensure a balance in characteristics between the two groups of firms that we want to compare (firms with a successful ECF campaign and firms with an unsuccessful ECF campaign). This way, we select only pair-matched firms on the selected attributes, and we also excluded firms outside the UK and firms with missing data for variables included in the multivariate analysis. Thereby, our original sample of 1,329 firms was reduced to 950 firms.

Our research focuses on the follow-on funding and failure of firms with ECF campaigns (successfully or not). We find that around 22.9% of firms in the sample get follow-on funding in the form of SECO (Seasoned Equity Crowdfunding Offering), VC/BA, M&A, or IPO. This percentage is higher for firms that were successful in their first ECF (32.7%) than firms with a first ECF unsuccessful (13.1%). As expected, we also identify different motivations of firms that decide to perform a second campaign. While the second campaign of firms with a successful first ECF campaign is used to finance the firm's growth, those that fail the first ECF campaign use the following campaigns to adjust the offering, by reducing the target amount or the price of the shares offered (lowering the pre-money valuation).

At the time of our study, 67% of the firms in our sample are still active, while almost 30% have been dissolved, are in liquidation or have an insolvency proceeding open. We also find that, as expected, the survival rate of firms with the first ECF campaign successful³⁹ (80.5%) is significantly higher than the firms that failed the first ECF campaign (53.4%). Even so, 64% of firms with the first ECF campaign unsuccessful are still active three years after the campaign.

Overall, the descriptive analysis confirms that, as expected, firms with the first ECF campaign unsuccessful have a significantly lower ability to get follow-on financing and have higher failure rates than firms with the first ECF campaign successful. However, these results may be explained by the ability of the crowd to select the best firms/projects (wisdom of the crowd) and/or by the inability of firms to get funding for their business plan. This way, we also analyse the factors that influence the follow-on financing and failure of firms that previously were involved in ECF campaigns.

Thus, in our paper, we start by investigating the factors that influence the positive outcomes of start-ups after the first ECF campaign, i.e., when firms obtain subsequent financing rounds or deliver an exit opportunity to crowdfunding. Considering the whole sample, some of the characteristics and outcomes of the first ECF campaign (the target amount, the nominee shareholder structure and the percentage funded) seem to influence the ability of

³⁹ At the time of this study, in the early months of 2021.

firms to get follow-on funding. However, we find that different factors influence the probability of getting follow-on of firms when we split the sample between the firms that were successful in the first ECF campaign and those that were not. For the group of firms that were successful in their first ECF campaign, the characteristics, and outcomes of ECF campaign do not significantly influence the probability of getting follow-on funding, which depends essentially on the characteristics of firms (debt ratio) and their teams (team size). However, for firms that failed the first ECF campaign, having a high target amount and a high percentage of funding raised significantly improves the probability of getting follow-on funding.

Then, we also analyse the failure rate of firms involved in ECF and find evidence that the hazard rate of firm failure is influenced by the outcomes of the first ECF campaign (the number of crowd investors and the presence of a large investor). We also find that getting subsequent funding significantly reduces the probability of firm failure. These results are still valid when we restrict the sample to successful firms in the ECF offering and they are aligned with previous research for crowdfunded firms. However, when we use a subsample of unsuccessful firms in the ECF campaign, the results are quite different. Except for the shareholder structure, none of the other variables related to the characteristics and outcomes of the ECF seems to influence the post-offering failure rate of firms. For firms that couldn't get funding from ECF only the firm age, team size and getting follow-on funding influence significantly their failure rate after the campaign.

Overall, the results for both analysis, follow-on funding, and firm failure, confirm the relevance of including firms with unsuccessful ECF campaigns in the research sample and that the conclusions of the previous research about the effect of ECF on firms' failure are not valid for firms with unsuccessful ECF campaigns.

The remainder of this chapter is structured as follows. Section 4.2 presents the literature review and develops the hypotheses for empirical analysis. Section 4.3 describes the research design, the data, the methodology and the variables used in the study. The empirical results of descriptive and multivariate analysis are reported in sections 4.4 and 4.5, respectively. Section 4.6 concludes and discusses the empirical results.

4.2. Literature review and hypotheses

Given the lack of history and the absence of credible reputation ([Huyghebaert & Van de Gucht, 2007](#)), start-ups have higher information asymmetries and agency costs than older firms and frequently face adverse selection and moral hazard problems ([Van Osnabrugge, 2000](#)). Given the limited information available about projects and their teams, it is challenging for investors to assess the projects' quality and distinguish the good from the bad ones, which could result in adverse selection problems. As the "good" and "bad" projects will have the same "price", the "good" projects could be driven out of the market by the "lemons" ([Akerlof, 1970](#)). Additionally, investors in start-ups also face moral hazard problems due to the difficulty of monitoring the actions of firms' managers and observe if the entrepreneurs are working hard and are making the best decisions ([Amit et al., 1998](#)). This way, traditional investors in start-ups, such as venture capitalists and business angels, use due diligence to deal with adverse selection problems in the pre-investment stage. Then, to reduce moral hazard issues, they frequently have a representation on firm boards ([Lerner, 1995](#)) or are involved in day-by-day operations ([Van Osnabrugge, 2000](#)) to actively monitor the firm's managers in the post-investment phase.

However, the adverse selection and moral hazard problems are exacerbated in ECF. First, crowd investors don't have the same experience and knowledge to evaluate the business plans and select projects/start-ups as venture capitalists and business angels ([Ahlers et al., 2015](#)). Second, given the small investment amounts of crowd investors, the resources (time and money) needed to perform complete due diligence and monitor the projects are relatively much higher ([Agrawal et al., 2014](#)). This way, crowd investors rely on signals of project quality to reduce such costs and to select the best projects, such as the equity retention of project entrepreneurs and the presence of institutional and bigger investors.

As entrepreneurs own private information that allows them to better evaluate the project quality, they will try to keep the highest share of capital possible for high-quality projects. Thus, according to the signalling theory ([Leland & Pyle, 1977](#)), the entrepreneur's willingness to invest in his project is perceived as a signal of project quality ([Busenitz et al., 2005](#)).

The crowd investors may also benefit from the advantages of large institutional investors. First, they can provide mentoring and support services (such as helping develop the business plan, facilitating strategic partnerships, building the firm's internal organisation, and accessing other financial intermediaries). Second, institutional investors can be viewed as a quality certification of the firm ([Denis, 2004](#); [Hellmann & Puri, 2002](#)). Moreover, as venture capitalists usually have representation on the firm's boards ([Lerner, 1995](#)) and business angels are often involved in day-to-day operations ([Van Osnabrugge, 2000](#)), crowd investors may benefit from their monitoring activities. Some authors also highlight venture capitalists' ability to identify start-ups with high growth potential ([Baum & Silverman, 2004](#)). Others suggest that the probability of failure is lower for firms financed by venture capital ([Puri & Zarutskic, 2012](#)).

Empirical research on crowdfunding confirms that equity retention is a measure of the perceived quality of projects in the context of equity crowdfunding projects ([Vismara, 2016](#)) and that the likelihood of post-campaign success is improved by the interest alignment between controlling shareholders and crowd investors ([Cumming, Meoli, et al., 2019](#)). Moreover, the presence of large and sophisticated investors increases the probability of success of crowdfunding campaigns ([Hornuf et al., 2018](#); [Kleinert et al., 2020](#); [Ralcheva & Roosenboom, 2016](#); [Vulkan et al., 2016](#)). [Signori and Vismara \(2018\)](#) also find evidence that by controlling for firms and offering specific factors, firms with quick success and with qualified investors in the ECF campaign, face a lower likelihood of failure. In fact, in their sample, none of the equity crowdfunded firms initially financed by qualified investors subsequently failed.

Thus, we argue that the characteristics of ECF campaign, such as high equity retention and the presence of a large (institutional) investor in equity-crowdfunding campaigns are effective signals of the quality of firms, facilitating the obtention of follow-on funding for the firm's later development phases and could be associated with higher survival rates of firms. This leads to our two first hypotheses:

H1: The higher the equity retention of entrepreneurs the higher the probability of the firm getting follow-on funding (H1a) and the lower the probability of firm failure (H1b).

H2: The presence of a large investor in the equity crowdfunding campaign increases the probability of the firm getting follow-on funding (H2a) and reduces the probability of firm failure (H2b).

However, some authors argue that the certification effect of venture capitalists ([Denis, 2004](#); [Hellmann & Puri, 2002](#)) in ECF campaigns, can be moderated by the high dispersion of investors in ECF, and some find evidence that a high dispersion of investors in ECF limits the probability of a successful follow-on funding by VC/BA ([Drover, Wood, et al., 2017](#); [Signori & Vismara, 2018](#)). This evidence is consistent with the view that a high dispersion of crowd investors reduces their incentives to monitor the management, with consequences on future firm performance ([Brennan & Franks, 1997](#)).

For instance, [Signori and Vismara \(2018\)](#) investigate follow-on funding of 212 successful ECF campaigns from the Crowdcube platform and find that 35% of crowdfunded firms pursued one or more seasoned equity offerings in the form of either private equity injection or follow-on crowdfunding offerings. The authors also find evidence that the probability of issuing further equity is lower for firms with more dispersed ownership (higher number of investors) and higher for firms with quick success (those that reach the target capital more quickly).

To reduce the difficulties associated with the dispersion of ownership of crowdfunded firms, some platforms propose a shareholder structure model with pooling voting rights – the nominee model. Contrary to the shareholder's direct model, where every single investor has voting rights in the same proportion of their cash-flows rights, in the nominee model, the voting rights are pooled for the community of crowd investors. In this model, it is the ECF platform itself that holds the shares and exercises the voting rights on behalf of the group of crowd investors.

Using a sample of 709 UK ECF firms over the 2011-2018 period, [Coakley et al. \(2021\)](#) analyse the probability of a firm having successful seasoned equity crowdfunded offering (SECO), after an initially successful campaign. They also find that campaigns using both nominee and co-investment shareholders models have a higher probability of conducting a

successful SECO campaign compared to campaigns employing the direct model⁴⁰, suggesting that potential moral hazard problems are mitigated by the monitoring capabilities of those models, which contributes to their follow-on success. These results are confirmed by [Butticè et al. \(2020\)](#) who, comparing a group of 290 ECF firms from Crowdcube and Seedrs with two control samples (one group of firms that did not receive any external seed financing and other groups of angel-backed firms), find that a successful equity crowdfunding campaign facilitates the attraction of VC financing, but this association is stronger for equity crowdfunding campaigns with a nominee shareholder structure compared to campaigns that chose a direct shareholder structure.

Therefore, in comparison to the direct shareholder model, the nominee structure can be more effective to deal with moral hazard issues, reducing the coordination costs associated with a high shareholder dispersion, and avoiding the free rider problems, related to the lower incentives of individual crowd investors to monitor the firms, with consequences on future firm performance ([Brennan & Franks, 1997](#)). This way, we argue that:

H3: The use of a nominee shareholder model in the ECF campaign (in opposition to a direct model) increases the probability of the firm getting follow-on funding (H3a) and reduces the probability of firm failure (H3b).

Previous empirical research also investigates the influence of ECF campaign outcomes (e.g., number of investors, quick success, amount raised) on the failure rate of firms and some find that a favourable assessment of the initial ECF campaign is a positive signal for post-campaign outcomes, both in terms of firm survival and follow-on funding ([Signori & Vismara, 2018](#)). In this context, [Drover, Wood, et al. \(2017\)](#) argue that a successful equity crowdfunding campaign from a platform with a reputation for producing successful ventures is a positive and effective signal about the start-up quality/value, increasing the probability of VC select the firm to formal due diligence. Moreover, according to [Hornuf et al. \(2018\)](#) the probability that a firm become insolvent, is liquidated, or is dissolved is lower when the amount raised during the previous ECF campaigns is higher, which may be explained by the less financial constraints of successful ECF firms. Though, the authors also recognize that

⁴⁰ Usually, the ECF platforms use one of three shareholder models in terms of investors voting rights: (i) Direct Model - platforms delivering individual voting rights to single investors; (ii) Nominee Model - platforms delivering pooled voting rights to the community of crowdfunding investors and (iii) Co-investment model (or syndicate-like platforms) - platforms with the involvement of a lead accredited investor.

other explanations cannot be excluded, such as the immaterial support of the crowd or the additional publicity stemming from ECF campaigns. The authors also find that a higher hazard of firm failure is associated with a higher number of VC investors. In this context, our last hypothesis is the following:

H4: Firms with positive outcomes of the ECF campaigns are associated with a higher probability of getting follow-on funding (H4a) and a lower rate of failure (longer time until failure) (H4b).

4.3. Research design

4.3.1. Data sources

The main purpose of this paper is to investigate how the characteristics and the outcomes of ECF campaigns influence the follow-on funding and the failure rate of start-ups. Thus, given the inexistence of a database containing all the companies that sought financing via ECF, we hand-collected the data about ECF campaigns. We started by hand collect the campaigns data from the two biggest platforms in the UK – Seedrs and Crowdcube, between April 2015 and October 2018. We then add financial and team information from the firms' websites, national firms' databases (e.g., Companies House for UK companies and Infoempresa.com for Spanish companies), and the BvD Orbis database. After excluding other forms of crowdfunding campaigns (bonds, funds, and convertibles) and firms without information on the BvD Orbis database, our initial sample includes 1,329 firms that carried out 1,470 Equity Crowdfunding Campaigns.

We further track the firms over time to determine what happened afterwards regarding follow-on funding and firm survival.

The data about **follow-on financing** was collected from the BvD Zephyr database as of April 4th, 2021. We first searched for all the deals on this database in which firms from our sample were involved as acquirers or targets. From the 1,377 deals found in the Zephyr database, we excluded 84 deals with the status "Rumour", "Rumour-expired", "Withdrawn" or "Rumour-Withdrawn", because these deals were not finalized and may never actually have taken place. As we are only interested in what happened after the campaign, we also excluded deals with the status date before the start of the firm's first ECF.

Then, we define several categories of investors based on the name and business description of the acquirer on the Zephyr Database:

- Crowd: deals for which the acquirer's name is "Crow-funding Investors".
- VC: deals for which the acquirer's name includes the expressions "Venture", "Private Equity", "Fund" or "Institutional Investors" and simultaneously the acquirer's business description is coherent with the venture capital activity.

- BA: deals for which the acquirer's name includes the expression "Angel" and simultaneously the acquirer's business description is coherent with the business angel activity.
- M&A: deals for which the acquirer is a company (acquirer's name includes the expressions "LTD", "SA", "PLC", "Corporation", "SE"; "Inc", "Company", "Special Purpose Vehicle", "Family Offices" or "Undisclosed Companies") whose activity is not related to venture capital or business angel (according to its business description).
- Private: deals for which the acquirer's name includes the expressions "Entrepreneurs", "Existing Investors" or "Existing Shareholders".

In the following step, for operations in which the acquirer's name is a person, we search on the Zephyr database for those names and find the number of operations with this acquirer's name. Then, we classified as "Business Angels" those with more than one operation and as "Private" the others. For the remaining deals (whose acquirer name is "Individuals", "Investor(s)", "Undisclosed Investor(s)", "Unnamed Investor" or without a name) we looked at the description of the deal ("Deal headline") for some expression that allowed us to classify them in the defined categories. In this step, we define another deal category – IPO, which includes the deals with the expressions “IPO” or “Initial Public Offering” in their descriptions. Deals that do not fit any of the previous criteria, are classified as "Unknown".

Finally, similarly to [Signori and Vismara \(2018\)](#), we grouped the follow-on funding in four categories:

- SECO (Seasoned Equity Crowdfunding Offering): this category combines the successful ECF from our hand-collected database with the “Crowd” operations dated after October 2018⁴¹ identified on the Zephyr database.
- VC/BA: includes Venture Capital and Business Angels deals identified in the Zephyr database.

⁴¹ We excluded the operations of the Zephyr database before October 2018 (the end date of our hand-collected sample) to avoid duplication of operations and because a careful analysis of the Zephyr database, in comparison with our hand-collected data, allowed us to identify that they include some ECF that were unsuccessful (and for the follow-on funding analysis we are only interested in successful campaigns).

- M&A: includes the M&A, Private Operations and Unknown deals identified in the Zephyr database;
- IPO: includes the Initial Public Offerings identified in the Zephyr database.

We collected data about the **firm's failure** and financial indicators from the BvD Orbis database as of February 25th, 2021. In our analysis, we consider that a firm fails if it becomes insolvent, is liquidated, or is dissolved after the equity crowdfunding campaign. We also consider that a firm fails when it becomes “Dormant”⁴² because even though it is still active, it is no longer performing any activity, being considered a “zombie firm” or an “empty shell” ([Cumming, Vanacker, et al., 2021](#)). A similar definition of failure was used by [Signori and Vismara \(2018\)](#). Their definition of failed firms includes “dissolved,” “in administration,” or “in liquidation” firms, as well as those whose mandatory filing of accounts is overdue by more than six months at Companies House, or which have ceased to operate according to their website.

Compared to other studies about the firm performance after the equity crowdfunding campaigns, our sample has some advantages. First, as we collected daily information about all ECF campaigns on both platforms, we avoided any selection or survivor biases. Second, previous studies on post-campaign outcomes include only firms with successful campaigns in their samples (e.g., [Bouaiss et al. \(2020\)](#), [Hornuf et al. \(2018\)](#), and [Signori and Vismara \(2018\)](#)) but our analysis includes both firms with successful and firms with unsuccessful ECF offers. Moreover, compared to previous research on post-campaign outcomes, our sample is larger and covers a long period in which the Equity Crowdfunding market is more mature. For instance, [Signori and Vismara \(2018\)](#) use a sample of 212 successfully funded initial equity offerings on Crowdcube between 2011 and 2015 and studied 413 firms that ran at least one successful equity crowdfunding campaign in Germany or the UK between 2011-2016 and [Bouaiss et al. \(2020\)](#) analyse 317 ECF campaigns from 277 French firms.

⁴² According to UK Government, a company may be “*dormant if it's not doing business ('trading') and doesn't have any other income, for example, investments*” (<https://www.gov.uk/dormant-company>, accessed on March 13, 2021).

4.3.2. Methodology and variables

4.3.2.1. Firm follow-on funding

To investigate the factors that influence the likelihood of companies getting follow-on funding after the ECF campaign, we use the Probit Model⁴³, as it provides consistent and unbiased estimates. The dependent variable is the follow-on funding, a dummy variable equal to 1 if the firm gets follow-on funding (FOF) after the first ECF campaign, and 0 otherwise.

According to our hypothesis, the explanatory variables are the percentage of equity retention (Ret); the presence of a large investor (dummy variable: LargeInv), the use of a nominee shareholder structure (dummy variable: Nominee), the number of crowd investors (CrowdInv) and the percentage raised in the first ECF campaign (PercRaised). We also add several controls related to firms' and teams' characteristics: firm age, firm size, debt ratio, team size, the average age of the team, the share of women in the team, and the industry group. Equation (1) represents the probit model for the follow-on funding probability of firms involved in ECF campaigns.

$$FOF = \alpha + \beta_1 Ret + \beta_2 LargeInv + \beta_3 Nominee + \beta_4 CrowdInv + \beta_5 PercRaised + \rho Controls + \varepsilon \quad (1)$$

4.3.2.2. Firm failure

To investigate the failure probability of firms involved in ECF campaigns we use two models. First, and similarly to the analysis of follow-on funding, we use a probit model⁴⁴ to investigate the factors that influence the probability of firm failure after the first ECF campaign. In this model, the dependent variable is failure, a dummy variable equal to 1 if the firm went into insolvency, was liquidated, was insolvent or become dormant, and 0 otherwise.

⁴³ As we did not collect the date of all follow-on funding events, we cannot use the Cox proportional hazard model for the follow-on funding analysis. However, this analysis could be done in future investigations.

⁴⁴ The probit model is used in other research about the failure rate of crowdfunded firms, such as [Hornuf et al. \(2018\)](#) or [Coakley et al. \(2021\)](#).

The independent and control variables are the same as for follow-on funding. However, in this model, we also added the follow-on funding variable, as the ability to obtain subsequent rounds of funding can also influence the firm's survival. Equation (2) represents the probit model for the failure probability of firms involved in ECF campaigns:

$$Failure = \alpha + \beta_1 Ret + \beta_2 LargeInv + \beta_3 Nominee + \beta_4 CrowdInv + \beta_5 PercRaised + \beta_6 FOF + \rho Controls + \varepsilon \quad (2)$$

Thereafter, we use a [Cox \(1972\)](#) proportional hazard model to investigate the time until firm failure using as a dependent variable the time to fail, which represents the duration until firm failure after the first equity crowdfunding campaign. Our observation period occurs after the firm's first ECF campaign and lasts until the firm's failure or the end of our study's period (right censoring on February 25, 2021). This way, the minimum time window for each firm is two years and four months⁴⁵.

The Cox proportional hazard model has two advantages ([Hornuf et al., 2018](#)): it doesn't require the specification of the time dependence distribution of the hazard, and it allows for right-censored data and time-varying independent variables. The dependent variable in this model is the time until firm failure after its first ECF campaign (time to fail - camp). The explanatory variables are the same as in the Probit Model.

Equation (3) represents the Cox proportional hazard model:

$$h(failure)_t = \delta_1 Ret + \delta_2 LargeInv + \delta_3 Nominee + \delta_4 CrowdInv + \delta_5 PercRaised + \delta_6 FOF + \Theta Control + \varepsilon \quad (3)$$

In this specification, $h(failure)_t$ is the hazard function, which gives for, any t, the probability of firm failure at time t conditional to firm not failing up to time t.

⁴⁵ Between October 2018 (the date of our last ECF campaign observation) and February 2021.

4.3.3. Variables

4.3.3.1. Dependent variables

In the multivariate analysis we use three dependent variables, one for the follow-on funding analysis and two for firm failure.

For the analysis of the determinants of firm **follow-on funding**, we use a dummy variable to capture if the firm gets subsequent financing after the first ECF campaign (from crowd investors, venture capitalists, business angels or other investors).

Then, for multivariate analysis of firm **failure**, we use two different dependent variables. First, we construct a dummy variable to capture whether the firm fails after the ECF campaign. Then, regarding the duration analysis, we use a variable representing the time until firm failure (time between the first ECF campaign and the company failure). For active firms at the time of our study, we right-censor these variables to avoid selection biases in the analysis.

4.3.3.2. Independent variables

To distinguish the wisdom of the crowd of equity investors and the underfunding problems of non-ECF financed firms, accordantly to the literature review, we analyse the factors that can influence the ability of firms to get subsequent financing rounds after the ECF campaign and the probability of firm failure. Such factors are related to the characteristics and outcomes of the first ECF campaign as well as the firms' and teams' characteristics.

According to our hypotheses and previous studies about failure rate and follow-on funding of equity-crowdfunded firms, we include a set of variables related to the ECF campaign's characteristics of the first campaign such as the equity retention ([Cumming, Meoli, et al., 2019](#); [Signori & Vismara, 2018](#)), the shareholder structure (with voting rights or not) ([Signori & Vismara, 2018](#)), and the target capital ([Cumming, Meoli, et al., 2019](#); [Hornuf, Schilling, & Schwienbacher, 2019](#); [Signori & Vismara, 2018](#)), Similarly, we also use a set of variables

related to the campaign's outcomes, such as the number of investors at the end of the campaign ([Bouaiss et al., 2020](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)), presence (or not) of a large investor ([Signori & Vismara, 2018](#)) and the percentage funded (ratio of the amount raised to funding goal) ([Hornuf et al., 2018](#)). All the variables related to the ECF campaign's characteristics and outcomes were collected by the authors from the platforms' websites.

Previous research on entrepreneurship also highlights the relevance of some attributes and structural characteristics of new ventures to get follow-on funding and to the failure rate of firms. For instance, some argue that young firms suffer from liabilities of newness and smallness and find empirical evidence that firm age and firm size have a positive influence on firm survival ([Anyadike-Danes & Hart, 2018](#); [Coad, Holm, Krafft, & Quatraro, 2018](#); [Esteve-Pérez, Pieri, & Rodriguez, 2018](#)). For instance, [Anyadike-Danes and Hart \(2018\)](#), using a sample of around 240 thousand UK private firms born in 1998, found evidence that age and size positively influence the firm's survival rate: *"By age 15, 90% of the UK firms born in 1998 are dead, and, for those surviving to age 15, the hazard of death is still about 10% a year"* and *"firms with more than five employees are half as likely to die in the next year as firms with less than five employees"* (p. 45).

Moreover, some entrepreneurship literature also highlights that the use of debt financing by start-ups significantly influences firm survival and finds empirical evidence that firms using business debt in the initial year of activity are less likely to fail ([Cole & Sokolyk, 2018](#)).

Then, based on human capital theory, previous research also shows evidence of the relevance of characteristics of founders and founding teams for firm survival and their ability to get follow-on funding, such as team size ([Eisenhardt & Schoonhoven, 1990](#); [Hornuf et al., 2018](#)), average team age ([Hornuf et al., 2018](#)) and team gender ([Boden & Nucci, 2000](#); [Faccio, Marchica, & Mura, 2016](#); [Hornuf et al., 2018](#); [Klapper & Parker, 2010](#)).

This way, we also include in the multivariate analysis a set of variables related to firms' characteristics (firm age, firm size, debt ratio) and team characteristics (team size, average age of team and share of women in the team).

These variables, which represent signals of the firm's and team's quality, were collected from the BVD Orbis database and are measured at the date of the firm's first ECF campaigns, except for firm age that is reported at the failure event (or at analysis date if the firm has not failed yet).

To control the effect of follow-on financing on failure rate, we also use a dummy variable (follow-on financing) to capture if the firm gets subsequent financing after the first ECF campaign (from crowd investors, venture capitalists, business angels or other investors).

Finally, we also control for unobserved heterogeneity by including industry dummies, to capture the diverse nature of business models and industry attractiveness.

Table 19 describes the variables used in our study.

Table 19 - Definition of variables

This table reports the definitions of variables and the source of information. We use three sources of information to construct our sample: (A) Hand-collected information from Crowdcube and Seedrs platforms; (B) BvD Zephyr database, and (C) BvD Orbis database.

Variable	Description	Source
Dependent variables		
Follow-on funding (FoF)	Dummy variable equal to 1 if the firm obtains follow-on funding (SECO, VC/BA, M&A or IPO) after the first ECF campaign, and 0 otherwise.	(A); (B)
Failure	Dummy variable equal to 1 if the firm went into insolvency, was liquidated, was insolvent or become dormant, and 0 otherwise.	(C)
Time to fail (camp)	Number of years until firm failure after the first ECF campaign.	(A); (C)
Campaign Characteristics		
Target	Target funding amount of the first equity campaign of the firm (thousands of GBP).	(A)
Equity Retention	Percentage of equity retained [(1- equity offered)] in the first ECF campaign of the firm.	(A)
Nominee Structure	Dummy variable equal to 1 if the firm uses a nominee shareholder structure, and 0 otherwise (firm with a direct shareholder structure, with or without voting rights).	(A)
Firm value	Pre-money value of the firm on the first ECF campaign (thousands of GBP).	(A)
Success	Dummy variable equal to 1 if the firm was funded on its first ECF campaign, and 0 otherwise. A firm is funded if the raised amount is equal (or higher) to the target amount of the campaign.	(A)
% Funded	Ratio between the raised and the target amount of the first ECF campaign of the firm.	(A)
# Investors	Number of investors in the first ECF campaign of the firm.	(A)
Large investor	Dummy variable equal to 1 if the first ECF campaign of firm i has a large investor, and 0 otherwise. A large investor is defined as an investor with an investment equal to or higher than 20% of the target amount.	(A)
# Campaigns	Number of ECF campaigns of the firm.	(A)
Firm and Team Information		
Age	Age of the firm (years) at the failure event (or at analysis date).	(C)
Firm Size	Firm's assets in the year of the first ECF campaign (thousands of GBP).	(C)
Debt ratio	Ratio between the loans and long-term debt to the total assets of the firm in the year of the first ECF campaign	(C)
Team Size	Number of managers of the firm.	(C)
Team Age	Average age of managers of the firm.	(C)
Female	Share of female managers of the firm.	(C)
Other control variables		
Year	Year of the ECF campaign (starting date of the first ECF campaign).	(A)
Industry	Industry code according to NACE- Rev. 2.	(A)
Platform	Platform (Crowdcube or Seedrs) where the campaign is launched.	(A)

4.4. Descriptive analysis

In our sample, most firms (90.7%) have only one ECF offering during our sample period (see **Table 20**), even though there are 123 firms with multiple campaigns.

Table 20 - Distribution of campaigns by firms

This table reports the number of ECF campaigns by firms and the distribution of firms by the number of ECF campaigns.

N° campaigns by firm	Observations		% of firms
	N° Camp.	N° Firms	
1	1,206	1,206	90.7%
2	216	108	8.1%
3	36	12	0.9%
4	12	3	0.2%
TOTAL	1,470	1,329	100.0%

During the first campaign, around half of the campaigns were successful, i.e., the raised amount was at least equal to the target amount, as we can see in **Table 21**. However, the firms (123) that decided to run subsequent campaigns have much higher success rates (from 50% in the first round to 78% in the second one).

Table 21 - Firms with successful campaigns in the first and the second campaign

This table reports the mean of the variable “Success” (i.e., the percentage of firms with successful campaigns) in the first and the second campaign, and the mean difference. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

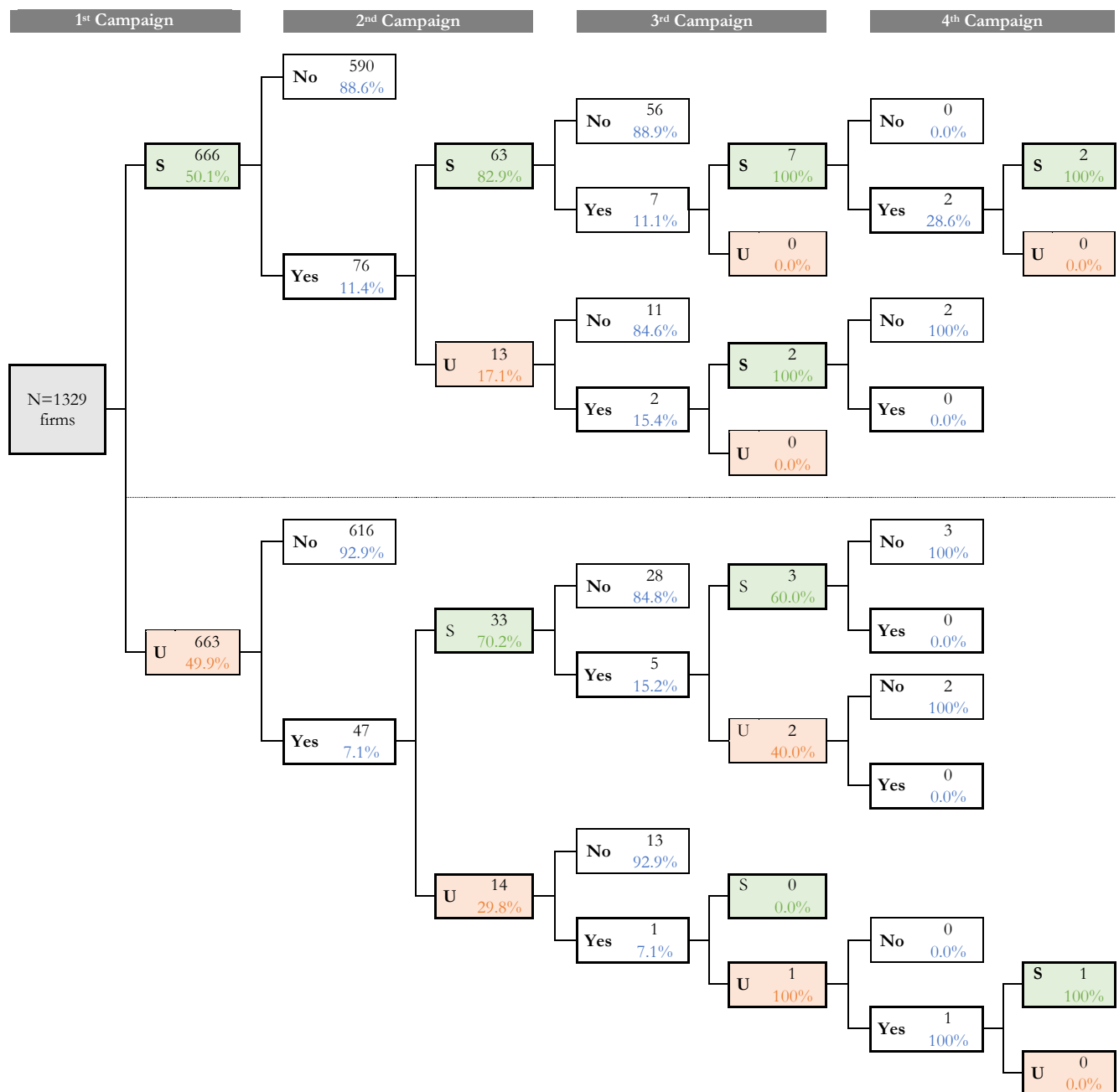
Variable	(G1) First Campaign		(G2) Second Campaign		Mean Diff (G2-G1)
	N	Mean	N	Mean	
Success	1,329	0.501	123	0.780	0.279***

Figure 3 shows the distribution of firms (number and %) by the campaign’s outcome (S=success or U=Unsuccess), in consecutive rounds, from the first to the fourth campaign. The success rate of the campaigns increases in the second round – from 50.2% during the first round to 82.9%, for firms with a successful first campaign, or 70.2%, for firms with a failed first ECF campaign. For firms with two consecutive successful campaigns that decide to go to a third (7 firms) and a fourth-round (2 firms), the success rate of the campaigns is even higher (100%). These results suggest that firms with follow-on campaigns adjust the

offerings based on the outcomes of the previous ones and, in that way, increase the funding probability, suggesting the existence of a learning process. An example of persistence in our sample is from one firm that, having failed the first three rounds, was finally successful in the fourth round.

Figure 3 – The success rate of sequential ECF campaigns

This figure reports the distribution of firms (number and %) by the outcome of the campaigns (S for successful campaigns and U for unsuccessful campaigns) from the first to the fourth campaign. From the second campaign onwards, “Yes” represents that the firm has started a new ECF campaign and “No” that the firm has not started.



However, comparing firms with a successful first ECF campaign with firms with a failed first campaign, as expected, we identify different motivations of firms that decide to perform a second campaign. As we can see in **Table 22**, while firms with successful campaigns in the first round significantly increase the funding target in the second round, the unsuccessful campaigns in the first round reduce their target amount in the second one. Additionally, the time elapsed between the end of the first ECF campaign and the start of the second ECF campaign is higher than one year for firms with a previously successful campaign (483 days), while such period is reduced to only 114 days for firms with a previous failed campaign. Moreover, the firm valuation (pre-money) in the second campaign is much higher for firms that were successful in the first one, while it decreases in firms with a failed first campaign. So, as expected, the second campaign in firms with a successful first one is used to finance the firm's growth, while firms that fail the first campaign use the following campaigns to adjust the offering, by reducing the target amount or the price of the shares offered (lowering the pre-money valuation).

Table 22 - Comparison between the first and second campaigns of the same firms

This table compares the target amount, equity retention, firm value, success, raised amount, percentage funded, and the number of investors of the first and second ECF campaign, for firms involved in (at least) two campaigns. The first part of the table uses the firms with a second ECF campaign that were successful in the first campaign. The second part of the table uses the firms with a second ECF campaign that were unsuccessful in the first one. In the last part of the table, we compare the variation of the campaign's variables from the first to the second campaign of these two groups.

Sample: Firms with a second ECF campaign that was successful in the first one					
Variables	(G1) First campaign		(G2) Second Campaign		Mean Diff (G2-G1)
	N	Mean	N	Mean	
Target	76	278	76	390	113**
Equity Retention	76	0.90	76	0.92	0.03***
Firm Value	76	2,982	76	7,019	4,037**
Success (1/0)	76	1.00	76	0.83	-0.17***
Raised Amount	76	469	76	557	88
% Funded	76	1.65	76	1.54	-0.11
# Investors	76	304	76	426	122**
Sample: Firms with a second ECF campaign that were unsuccessful in the first one					
Variables	(G1) First campaign		(G2) Second campaign		Mean Diff (G2-G1)
	N	Mean	N	Mean	
Target	47	289	47	209	-80
Equity Retention	47	0.87	47	0.90	0.03**
Firm Value	47	2,347	47	2,109	-238
Success (1/0)	47	0.00	47	0.70	0.70***
Raised Amount	47	118	47	223	105**
% Funded	47	0.36	47	1.08	0.73***
# Investors	47	79	47	146	67***

Sample: All Firms with a second campaign					
Variables (Variation of the variables between the 2nd campaign and the 1st campaign)	(G1) Firms with first campaign successful		(G2) Firms with first campaign unsuccessful		Mean Diff (G2-G1)
	N	Mean	N	Mean	
Target Variation	76	113	47	-80	-193***
Equity Retention Variation	76	0.03	47	0.03	0.00
Firm Value Variation	76	4,037	47	-238	-4,275***
Raised Amount Variation	76	88	47	105	17
% Funded (variation)	76	-0.11	47	0.73	0.83***
# Investors variation	76	122	47	67	-56
N° days between Campaigns	76	483	47	114	-369***

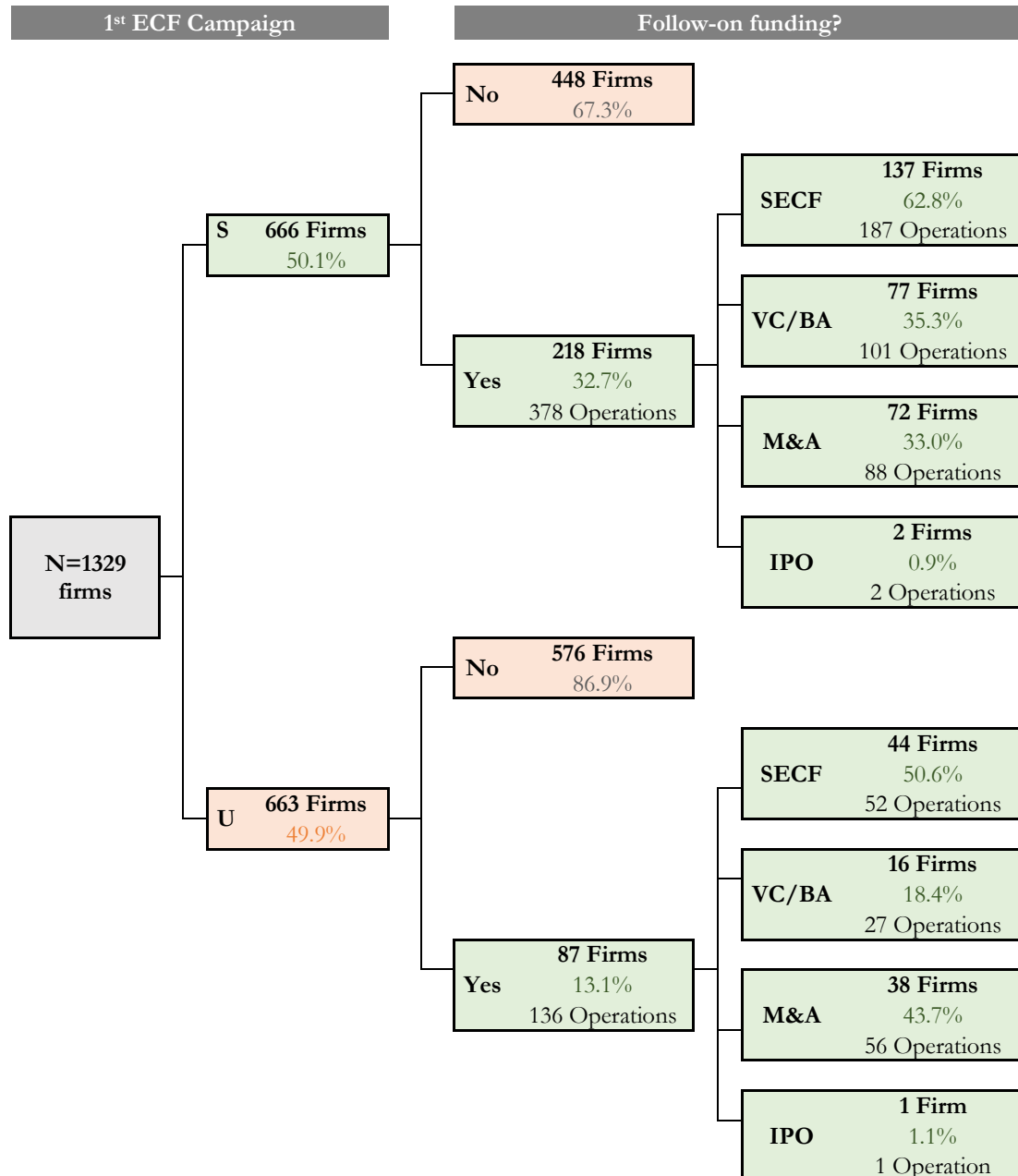
Until now, we observed the sequential ECF financing rounds in both platforms from our initial sample (firms with ECF campaigns in Crowdcube and Seedrs between April 2015 and October 2018). But, after the ECF campaigns in these two platforms, some of the firms are still able to get equity financing from other ECF platforms and other sources, such as VC/BA, M&A, and IPO (according to the data retrieved from the BvD Zephyr database).

Figure 4 reports the number of firms (and the corresponding number of operations) that obtained follow-on funding after the first ECF campaign. In our sample, after the first ECF campaign, around 22.9% of firms (305⁴⁶ of 1329 firms) get follow-on funding in the form of SECO, VC/BA, M&A, or IPO. However, this percentage is higher for firms that were successful in their first ECF (32.7%) compared to firms with a first ECF unsuccessful (13.1%). The SECO is the form of follow-on financing most used by firms with ECF campaigns. A similar number of firms with a first successful ECF campaign are involved in follow-on operations with VC/BA (77 firms) and M&A (72 firms). However, among the firms with a first unsuccessful ECF campaign that get follow-on funding, only 18.4% of firms get follow-on financing from VC/BA, and the operations of M&A are more frequent (43.7%). Both groups were involved in IPO, although this type of operation is rare in our sample.

⁴⁶ Include the 218 firms with a first ECF successful and the 87 firms of firms that failed the first ECF campaign.

Figure 4 - Sequential follow-on funding of firms involved in ECF campaigns

This figure reports the number of firms (and the corresponding number of operations by typology) that obtained (or did not) follow-on funding (Yes or No) after the first ECF campaign (S - Successful or U - Unsuccessful).



In our data, we also get information about firms that do not survive after the first ECF campaign. From *Table 23* to *Table 25* we analyse the failure rate of firms after the first equity crowdfunding campaign. At the time of our study (early 2021), 67% of the firms with equity crowdfunding campaigns in Seedrs and Crowdcube between April 2015 and October 2018, are still active, while almost 30% have been dissolved or liquidated. However, the survival rate of firms with the first ECF campaign successful (80%) is much higher than the firms that failed the first ECF campaigns (53%).

Table 23 - Current firm status

This table reports the current firm status (at the time of the study: February 2021) in the BvD Orbis database.

Status (at 25/02/2021)	All firms		Firms with first ECF campaign unsuccessful		Firms with first ECF campaign successful	
	N	%	N	%	N	%
Active	890	67.0%	354	53.4%	536	80.5%
Active (dormant)	37	2.8%	33	5.0%	4	0.6%
Active (insolvency proceedings)	17	1.3%	7	1.1%	10	1.5%
Dissolved	316	23.8%	243	36.7%	73	11.0%
In liquidation	68	5.1%	26	3.9%	42	6.3%
Status unknown	1	0.1%	0	0.0%	1	0.2%
TOTAL	1,329	100%	663	100%	666	100%

However, as the probability of failure naturally increases over time, we also analyse the firm's status, year by year, after the end of the first campaign. As we can observe in *Table 24*, of the 1,329 firms in our sample, 6% failed (dissolved, liquidated, dormant or with insolvency proceedings) one year after the end of the first campaign. In the second year, this percentage increased to 15% and 24% in the third year. Again, as expected, firms with the first ECF successful have lower failure rates than firms with the first ECF campaign unsuccessful. At the end of the third year after the first ECF campaign, the failure rate is 12%⁴⁷ for firms with the first ECF successful, and it is around three times higher (36%) for firms with the first ECF campaign unsuccessful.

⁴⁷ The failure rate of firms successfully funded by equity crowdfunding firms is lower than the failure rate found by [Signori and Vismara \(2018\)](#). Using a sample of 212 successfully funded initial equity offerings on the platform Crowdcube from 2011 to 2015, they found that 18% of the firms failed until the end of April 2017.

Table 24 - Firm status by year after the first campaign

This table reports the firm status in years 1, 2 and 3 after the end of the first campaign. Failure includes any of the following statuses: active (dormant), active (insolvency proceedings), dissolved, in liquidation and status unknown.

Firm status after 1 st campaign	All firms			Firms with first ECF campaign unsuccessful			Firms with first ECF campaign successful		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Active	1,250	1,124	1,009	596	501	425	654	623	584
%	94%	85%	76%	90%	76%	64%	98%	94%	88%
Failure	79	205	320	67	162	238	12	43	82
%	6%	15%	24%	10%	24%	36%	2%	6%	12%
Total	1,329	1,329	1,329	663	663	663	666	666	666

Firm age is one of the organizational attributes that researchers used to analyse the new ventures' survival ([Soto-Simeone, Sirén, & Antretter, 2020](#)), as such, we also compared the failure rate by firm age (**Table 25**). Naturally, the cumulative failure rate of firms increases with firm age, but this analysis confirms that firms with unsuccessful ECF campaigns fail more quickly than firms with successful campaigns.

Table 25 - Failure rate by firm age

This table reports the failure rate by firm age. Failure refers to any of the following statuses: active (dormant), active (insolvency proceedings), dissolved, in liquidation and status unknown.

Failure rate by firm age	1 year old	2 years old	3 years old	4 years old	5 years old
All firms					
Total number of firms	1,329	1,329	1,329	1,329	1,329
Number of failed firms	0	33	74	132	200
Failure rate	0.000	0.025	0.056	0.099	0.150
(G1) Firms with first ECF campaign unsuccessful					
Total number of firms	663	663	663	663	663
Number of failed firms	0	30	67	106	157
Failure rate	0.000	0.045	0.101	0.160	0.237
(G2) Firms with first ECF campaign successful					
Total number of firms	666	666	666	666	666
Number of failed firms	0	3	7	26	43
Failure rate	0.000	0.005	0.011	0.039	0.065
Mean Diff of Failure rate (G2-G1)	0.000	0.041***	0.091***	0.124***	0.172***

Overall, we observe that firms with the first ECF campaign unsuccessful have significantly higher failure rates than firms with the first ECF campaign successful. This result may be explained by the ability of the crowd to select the best firms/projects and/or by the financial

difficulties of firms to implement their business plans caused by the incapacity to finance their projects after being unsuccessful in the equity crowdfunding campaign. So, our research question is about what factors explain the difference in failure rates between the two groups (firms with the first ECF campaign successful campaign and firms with the first ECF campaign unsuccessful). The failure rate of firms with the first ECF campaign unsuccessful is, as expected, higher than the ones for successfully funded firms by Equity Crowdfunding in the first campaign. However, are these results related to the lack of financing or to the other worst characteristics of such firms that, in any case, will fail?

Nevertheless, 64% of firms with the first ECF campaign unsuccessful are still active three years after the first campaign (see **Table 24**), which is intriguing and leads to our next research question: how do firms survive and are financed after the failure of the first ECF campaign? In this context, we also investigate the follow-on funding of firms after the first ECF campaign.

The descriptive statistics of our sample are presented in **Table 26**. In this table, we also compare the descriptive statistics, first, between the firms that were involved in subsequent rounds of financing and those that were not and, second, between the surviving firms and failed firms.^{48,49}

In our sample, 23% of firms obtain follow-on funding after the first ECF campaign, in the form of equity crowdfunding, venture capital, business angels, M&A or IPO. This percentage is significantly higher for surviving firms (29%) than for failed firms (10%). Comparing firms that obtained follow-on funding with those that did not, we find that, except for shareholder structure (nominee structure), all other variables related to the characteristics and outcome of ECF are significantly different between the two groups. However, when we look for the variables related to firm and teams' characteristics, only firm age and team size are statistically different between them.

⁴⁸ In **Appendix 7** we also report a comparison of descriptive statistics between failed and not failed firms, where we can observe that the failure rate and time to failure are significantly worse for firms with unsuccessful first ECF campaigns. The percentage of failed firms is also higher for unsuccessful firms in their first equity crowdfunding campaign (47%) compared to firms with a successful first campaign (20%). Additionally, firms with successful ECF campaigns fail later. This evidence suggests that post-campaign outcomes of firms depend on the success of the first ECF campaign.

⁴⁹ The pairwise correlation matrix is presented in **Appendix 8**.

Table 26 - Descriptive statistics

This table reports, in the first columns, the descriptive statistics for all firms in our sample. The next columns report the number of firms and the variable mean for firms without follow-on funding after the first ECF campaign (G1) and firms with follow-on funding (G2) and failed firms (G3) and surviving firms (G4) and the t-tests on the differences between these two groups. The last columns report the number of firms and the mean of each variable for the corresponding t-tests on the differences between these two groups. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Variable definitions are reported in **Table 19**.

Variable	Unit	Obs	Mean	Std. Dev.	Min	Max	G1 (Firms without FoF)	Mean	G2 (Firms with FoF)	Mean	Mean Diff (G1-G2)	G3 (Surviving Firms)	Mean	G4 (Failed Firms)	Mean	Mean Diff (G3-G4)
Follow-on funding	1/0	1,329	0.23	0.42	0.00	1.00	1,024	0.00	305	1.00	-1.00	890	0.29	439	0.10	0.19***
Failure	1/0	1,329	0.33	0.47	0.00	1.00	1,024	0.38	305	0.15	0.24***	890	0.00	439	1.00	-1.00
Time to fail (incorp)	Years	1,329	6.84	3.25	1.10	29.02	1,024	6.69	305	7.34	-0.66***	890	7.65	439	5.20	2.45***
Time to fail (camp)	Years	1,329	3.44	1.38	0.00	5.83	1,024	3.30	305	3.94	-0.64***	890	4.03	439	2.26	1.77***
Target	th. GBP	1,329	326	377	17	6,000	1,024	286	305	461	-176***	890	357	439	264	93***
Equity Retention	%	1,329	0.88	0.06	0.50	0.99	1,024	0.88	305	0.89	-0.01**	890	0.89	439	0.87	0.01***
Nominee Structure	1/0	1,316	0.42	0.49	0.00	1.00	1,015	0.41	301	0.45	-0.03	880	0.40	436	0.47	-0.07**
Firm value	th. GBP	1,329	4,106	8,168	80	100,000	1,024	3404	305	6462	-3,058***	890	4779	439	2741	2,039***
Success	1/0	1,329	0.50	0.50	0.00	1.00	1,024	0.44	305	0.71	-0.28***	890	0.60	439	0.30	0.31***
% Funded	%	1,329	0.92	0.74	0.00	6.17	1,024	0.83	305	1.26	-0.43***	890	1.06	439	0.65	0.41***
# Investors	Number	1,329	230	351	4	3,709	1,024	185	305	385	-200.08***	890	283	439	124	159***
Large investor	1/0	1,329	0.44	0.50	0.00	1.00	1,024	0.40	305	0.54	-0.14***	890	0.50	439	0.31	0.19***
Firm Age	Years	1,329	6.93	3.25	1.10	29.02	1,024	6.79	305	7.40	-0.61***	890	7.65	439	5.48	2.17***
Firm Size	th. GBP	1,124	635	3,444	0	102,411	848	565	276	852	-288	825	743	299	337	406***
Debt ratio	%	1,124	0.27	3.16	0.00	97.68	848	0.30	276	0.17	0.14	825	0.30	299	0.19	0.11
Team Size	Number	1,325	4.70	6.20	1.00	106.00	1,021	3.86	304	7.49	-3.63***	889	5.71	436	2.63	3.07***
Team Age	Years	1,291	42.42	9.06	21.47	77.66	993	42.52	298	42.09	0.43	863	42.82	428	41.63	1.19**
Female	%	1,325	0.20	0.27	0.00	1.00	1,021	0.19	304	0.20	-0.01	889	0.20	436	0.19	0.01

At the time of our study, 33% of the firms have already failed and such firms took, on average, 6.84 years to go bankrupt since their incorporation or 3.44 years since the first ECF campaign.

The mean target amount of ECF campaigns is 326 thousand GBP and ranges from 17 thousand to 6 million GBP. The equity retained by entrepreneurs is always larger than 50% (88%, on average), and 40% of firms offer a nominee structure⁵⁰ for crowd shareholders. The pre-money value of firms on the first equity crowdfunding campaign ranges from 80 thousand GBP to 100 million GBP (4.1 million GBP, on average). On average, the ratio between the raised and the target amount is 92%, each campaign attracts 230 investors, and around 44% of firms have at least one large investor (with an investment equal to or higher than 20% of the target amount).

The mean age of firms involved in ECF campaigns is around 6.93 years old. On average, firms asking for funding in ECF campaigns are small, as their assets are, on average, lower than one million GBP at the year of the first campaign. In our sample, the team size of firms is around 4.7 people with an average age of 42 years. Only 20% of the managers or directors of firms are female.

Except for the debt ratio and the share of female managers, all the other variables are significantly different for surviving and failed firms. This evidence suggests that the characteristics and outcomes of ECF, as well as the firm and team characteristics, are relevant for firm survival.

⁵⁰ Nominee structure is a shareholder model where platforms deliver pooled voting rights to the community of crowdfunding investors.

4.5. Multivariate analysis

So far, we have described the data and presented the descriptive statistics of the variables, but our main interest is to compare the probability of follow-on funding and the survival of firms that were successful with those that were unsuccessful in the first ECF campaign. However, endogeneity can be a potential concern, in this context, because could exist unobserved factors that simultaneously determine the success of ECF campaigns and the post-campaign outcomes. Companies with lower risk and better prospects for future growth may be more likely to succeed in ECF campaigns. They will also be those that are more capable of raising funding from other investors and less likely to go bankrupt.

This way, following previous research about ECF (e.g., [Eldridge et al. \(2021\)](#), [Butticè et al. \(2020\)](#) and [Vismara \(2019\)](#)), we use propensity score matching to overcome potential endogeneity and self-selection problems and to ensure balance in characteristics between the two types of firms. As [Butticè et al. \(2020\)](#), we based our matching on propensity score ([Heckman, Ichimura, & Todd, 1997](#)), selecting the nearest neighbour (1 to 1 matching), and pair-matched firms on the industry, age, size, debt ratio, and geographical location in the year of the first equity crowdfunding campaign. We also excluded firms outside the UK, to reduce cross-country heterogeneity, and firms without financial information or with missing data for other variables included in the multivariate analysis. Thereby, our original sample of 1,329 firms is reduced to 950 firms.

Table 27 reports the t-test for the independent variables used in the propensity score matching before and after the match. As we can see, after the matching there are no statistically significant differences between the distribution of industry, firm age, firm size, debt ratio and geographical location between the two samples of firms.

Table 27 - Statistics of matching variables before and after matching

This table reports the t-test for the independent variables used in the propensity score matching before and after the match.

Variable	Before Matching					After Matching				
	G1 - Firms not funded in the first ECF campaign		G - Firms funded in the first ECF campaign		Mean Diff (G1-G2)	G1 - Firms not funded in the first ECF campaign		G2 - Firms funded in the first ECF campaign		Mean Diff (G1-G2)
	N	Mean	N	Mean		N	Mean	N	Mean	
Industry group	475	38.63	577	35.75	2.88***	475	38.63	475	39.27	-0.64
Firm age	482	7.09	579	7.25	-0.16	475	7.12	475	7.03	0.1
Firm size	482	486	579	728	-242	475	493	475	638	-145
Debt ratio	482	0.23	579	0.11	0.13*	475	0.24	475	0.12	0.12
London	482	0.37	579	0.47	-0.10***	475	0.37	475	0.37	0.00

4.5.1. Firm follow-on funding

A positive outcome for start-ups is achieved when firms survive and obtain subsequent rounds of financing or deliver an exit opportunity to crowdfunding investors. In this way, using the Probit Model, we analyse the factors that influence the probability of firms to obtain follow-on funding after the ECF campaign, in the form of SECO, VC/BA, M&A or IPO.

We start by analysing separately the explanatory variables related to the characteristics of ECF campaigns (Model 1), the ECF campaigns' outcomes (Model 2), and firms' and teams' characteristics (Model 3). Model 4 includes all the explanatory variables. For robustness check, we also included model 5, which adds the dummy variable for success (in the first ECF campaign) to previous model. We then split the sample between firms with a successful first ECF campaign (Model 6) and firms with an unsuccessful first ECF campaign (Model 7). The results of these regressions are reported in *Table 28*.

We test for multicollinearity between the independent variables using variance inflation factors (VIF). The mean VIF is 1.39, much lower than 10 (see *Appendix 9*), indicating that multicollinearity is not a concern ([Chatterjee & Hadi, 2015](#)).

When we include in the probit regression only the variables related to the characteristics of the ECF campaign (model 1) and its outcomes (model 2), and we use the full sample (firms with a successful and an unsuccessful first ECF campaign), we find that, as expected, the percentage of equity retention, the nominee shareholder structure, the percentage funded and the number of investors influence positively the probability of firms getting follow-on funding after the first ECF campaign. These results follow our hypotheses (H1a, H3a, and H4a). So, except for hypothesis H2a, i.e., that the presence of a large investor in the ECF campaign increase the likelihood of a firm getting follow-on funding, our results are in accordance with our expectations.

Although, after controlling for other factors related to firm's and teams' characteristics (model 4), we find that, among the variables related to the ECF campaign, only the presence of a nominee structure, the percentage funded, and the target amount still significantly influence the follow-on funding. Firms with a nominee shareholders' structure (H3a), a higher percentage funded (H4a) and higher target amount have a higher chance of getting subsequent funding. Our results for the full sample also suggest that the larger the firm size and the team size, the more likely is the firm to obtain follow-on funding. We do not find evidence that other firms' and teams' characteristics significantly influence the probability of a firm getting funding after the first ECF campaign.

However, we are mainly interested in analysing if the drivers of follow-on funding depend on the success of the ECF campaign. This way, we split the sample between firms with a successful first ECF campaign (model 6) and firms with an unsuccessful first ECF campaign (model 7).

We find that, for the group of firms with a successful first ECF round, we do not find evidence that the characteristics and the outcomes of the first ECF campaign significantly influence the ability to get follow-on funding. For this group, only the debt ratio and the team size have a positive impact on such probability. So, none of our hypotheses related to follow-on funding is confirmed.

For the other group, firms not funded in the first ECF, the probability of subsequent financing is only positively influenced by the target amount of the ECF campaign, the

percentage funded, and the team size. Other characteristics of the ECF campaign and its outcomes do not influence the probability of follow-on funding. For this group of firms, the results of the multivariate analysis only confirm the hypothesis 4a, that the outcomes of the ECF campaign (percentage funded) influence positively the likelihood of firms getting follow-on funding.

Table 28 - Follow-on funding Probit Model

This table reports the result of the Probit regression on follow-on funding. The dependent variable assumes the value of 1 if the firm gets follow-on funding after the first ECF campaign, and 0, otherwise. From Model 1 to Model 3 we include separately the explanatory variables related to ECF campaigns' characteristics (Model 1), ECF campaigns' outcomes (Model 2), and firms' and team's characteristics (Model 3). Model 4 includes all the explanatory variables of Equation 1. Model 5 adds, to the previous model, a dummy variable for the success of the first ECF campaign. Then, we split the sample between firms with a successful first ECF campaign (Model 6) and firms with an unsuccessful first ECF campaign (Model 7). All models control for industry group (not reported). The coefficients reported are marginal effects. Standard errors are reported in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Variable definitions are reported in **Table 19**.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Equity Retention	1.261* (0.737)			-0.644 (0.796)	-0.514 (0.802)	-1.230 (1.109)	-0.255 (1.240)
Nominee Structure	0.185* (0.095)			0.211** (0.099)	0.213** (0.099)	0.193 (0.133)	0.214 (0.164)
Target	0.327*** (0.055)			0.157** (0.076)	0.165** (0.076)	0.118 (0.107)	0.208* (0.117)
% Funded		0.292*** (0.083)		0.315*** (0.092)	0.189 (0.117)	0.072 (0.133)	0.778** (0.383)
# Investors		0.000** (0.000)		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.001)
Large Investor		0.054 (0.104)		-0.014 (0.107)	-0.056 (0.110)	-0.056 (0.137)	-0.191 (0.203)
Firm Age			-0.029 (0.018)	-0.023 (0.019)	-0.019 (0.019)	-0.023 (0.026)	-0.014 (0.027)
Firm Size			0.084*** (0.022)	0.051** (0.024)	0.043* (0.024)	0.028 (0.040)	0.041 (0.032)
Debt Ratio			0.020 (0.038)	0.008 (0.043)	0.018 (0.042)	0.258* (0.133)	-0.408 (0.283)
Team Size			0.081*** (0.012)	0.067*** (0.013)	0.069*** (0.013)	0.065*** (0.015)	0.105*** (0.028)
Av. Team Age			-0.010* (0.006)	-0.009 (0.006)	-0.008 (0.006)	-0.010 (0.008)	-0.005 (0.009)
Female			-0.004 (0.188)	-0.003 (0.192)	-0.005 (0.192)	0.114 (0.257)	-0.191 (0.315)
Success of 1 st ECF campaign					0.282* (0.159)		
Observations	950	950	950	950	950	475	475
LR chi2	41.63	51.84	97.78	119.50	122.63	50.40	53.97
Pseudo-R2	0.0401	0.0500	0.0942	0.1152	0.1182	0.0844	0.1347
Correctly predicted values	76.42%	76.74%	78.00%	78.11%	78.11%	71.79%	85.05%

4.5.2. Firm failure

Table 29 reports the results of the Probit regressions on firm failure. As in the follow-on funding analysis, we start by exploring separately the influence of variables related to the characteristics of ECF campaigns (Model 8), the ECF campaigns' outcomes (Model 9) and firms' and team's characteristics (Model 10). In this case, we also explore the influence of follow-on funding on firm failure (Model 11). Model 12 includes all the explanatory variables related to the characteristics of the first ECF campaign, its outcomes, and firms' and teams' characteristics. For robustness check, we also included model 13, which adds the dummy variable for success (in the first ECF campaign) to Model 12. Model 14 includes all the explanatory variables of our model described in Equation 2. From model 8 to model 14 we use the full sample. Then, we split the sample between firms with a successful first ECF campaign (Model 15) and firms that failed the first ECF campaign (Model 16).

In model 8, all the variables related to ECF campaign characteristics significantly influence the probability of firms failing. As expected, the higher the target and the equity retention in ECF campaign, the lower the probability of firm failure, in accordance with our hypothesis H1b. The use of a nominee shareholder structure (nominee structure=1) also influences the probability of firms failing but in the opposite way of the proposed in hypothesis H3b.

The following model (9) includes only the variables related to the outcomes of the ECF campaign. We find that, as expected, both the number of crowd investors (hypotheses H4b) and the presence of a large investor (hypotheses H2b) influence positively the firm survivorship.

Considering only the variables related to firms' and teams' characteristics (model 10), we find that, under the argument that start-ups suffer from liabilities of newness and smallness ([Anyadike-Danes & Hart, 2018](#); [Coad et al., 2018](#); [Esteve-Pérez et al., 2018](#)), we find empirical evidence that firm age and firm size have a positive influence on firm survival.

Finally, as expected, we find that obtaining follow-on financing reduces the probability of firm failure (model 11) as it is crucial for firm development and survival after the ECF campaign.

Table 29 - Failure Probit Model

This table reports the result of the Probit regression on failure. The dependent variable assumes the value 1 if the firm went into insolvency, as liquidated, was insolvent or became dormant, and 0 otherwise. From Model 8 to Model 11, we include separately the explanatory variables related to ECF campaigns' characteristics (Model 8), ECF campaigns' outcomes (Model 9), firms' and team's characteristics (Model 10) and follow-on funding (Model 11). Model 12 joints all the variables related to the characteristics and outcomes of the campaign, the firm' characteristics, and the teams' characteristics. Model 13 adds, to the previous model, a dummy variable for the success of the first ECF campaign. Model 14 includes all the explanatory variables of equation 2. Then, we split the sample between firms with a successful first ECF campaign (Model 15) and firms with an unsuccessful first ECF campaign (Model 16). All models control for industry group (not reported). The coefficients reported are marginal effects. Standard errors are reported in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Definitions of variables are reported in **Table 19**.

VARIABLES	(8) Failure	(9) Failure	(10) Failure	(11) Failure	(12) Failure	(13) Failure	(14) Failure	(15) Failure	(16) Failure
Equity Retention	-1.965*** (0.680)				0.572 (0.802)	0.525 (0.805)	0.548 (0.804)	2.261 (1.468)	-0.531 (1.043)
Nominee Structure	0.191** (0.091)				0.133 (0.099)	0.133 (0.099)	0.149 (0.100)	0.033 (0.156)	0.236* (0.137)
Target	-0.223*** (0.054)				0.216*** (0.081)	0.207** (0.082)	0.226*** (0.081)	0.267* (0.142)	0.159 (0.106)
% Funded		-0.042 (0.100)			-0.042 (0.115)	0.024 (0.150)	-0.014 (0.116)	0.116 (0.179)	-0.061 (0.357)
# Investors		-0.001*** (0.000)			-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.001)	0.001 (0.001)
Large Investor (1/0)		-0.270** (0.106)			-0.222** (0.113)	-0.209* (0.115)	-0.227** (0.114)	-0.251 (0.157)	-0.196 (0.184)
Firm Age			-0.141*** (0.022)		-0.160*** (0.023)	-0.160*** (0.023)	-0.162*** (0.023)	-0.121*** (0.038)	-0.189*** (0.031)
Firm Size			-0.024 (0.018)		-0.005 (0.020)	-0.003 (0.020)	-0.003 (0.020)	0.065 (0.047)	-0.017 (0.025)
Debt Ratio			0.006 (0.035)		0.015 (0.038)	0.011 (0.038)	0.015 (0.038)	-0.213 (0.304)	0.023 (0.042)
Team Size			-0.130*** (0.023)		-0.134*** (0.025)	-0.134*** (0.025)	-0.123*** (0.026)	-0.125*** (0.037)	-0.131*** (0.038)
Av. Team Age			0.005 (0.005)		0.002 (0.005)	0.002 (0.005)	0.001 (0.005)	-0.005 (0.009)	0.002 (0.007)
Female			-0.083 (0.172)		-0.078 (0.174)	-0.077 (0.174)	-0.070 (0.175)	0.106 (0.270)	-0.319 (0.238)
Follow-on funding				-0.625*** (0.115)			-0.315** (0.132)	-0.312* (0.179)	-0.342* (0.203)
Success of 1 st ECF campaign						-0.127 (0.187)			
Observations	950	950	950	950	950	950	950	475	475
LR chi2	29.87	65.25	155.45	32	194.56	195.02	200.35	68.18	114.64
Pseudo-R2	0.0266	0.058	0.1382	0.0285	0.1730	0.1734	0.1781	0.1469	0.1837
Correctly predicted Values	71.47%	72.11%	76.95%	72.11%	77.37%	77.16%	77.26%	80.21%	73.47%

However, when we take into consideration all the variables of equation 2 (model 14), only the number of crowd investors (H4b), the presence of a large investor (H2b), the firm age, the team size, and the follow-on funding reduces the probability of firm failure. The target amount has a positive influence on firm failure. Thus, we do not find evidence for supporting hypotheses H1b and H3b, i.e., that equity retention and the use of a nominee shareholder structure in ECF campaigns significantly influence the failure rate of firms.

We then rerun the probit regression with all the variables but split the sample between firms with a successful first campaign (model 15) and firms with an unsuccessful first campaign (model 16). Our results suggest that the factors that influence the firm failure of firms with a successful first ECF campaign are quite similar to the full sample, but that conclusion is not valid for the group of firms with a first unsuccessful ECF campaign. Among the variables related to the characteristics and outcomes of ECF campaigns, only the presence of a nominee structure influences the failure rate of firms with a first unsuccessful ECF campaign. However, contrary to our expectations (H3b) the results suggest that the use of a nominee structure induces a higher probability of failure. The other variables become statistically not significant. Moreover, the marginal effects of age and the team size on failure are higher, suggesting that the variables related to the firm's and team's characteristics are more relevant for firms with unsuccessful campaigns. However, as for the other group of firms, the probability of survival increases when they obtain follow-on financing.

We also investigate the time until firm failure after the ECF campaign. For that we use the Cox Proportional Hazard Model, using as dependent variable the time to fail that represents the duration until firm failure after the first equity crowdfunding campaign. The results of these regressions are reported in **Table 30**.

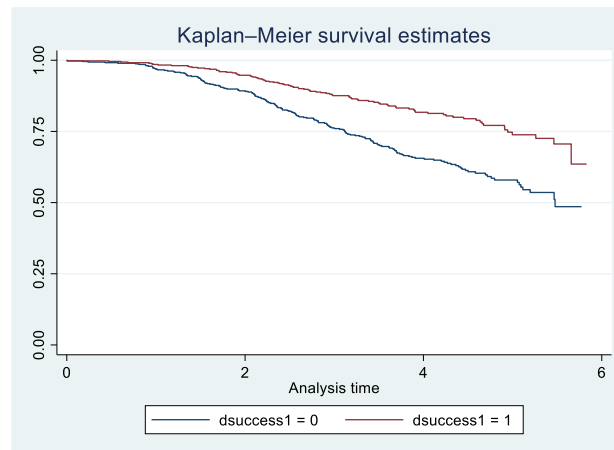
Table 30 - Duration Analysis of Failure

This table reports the result of the Cox Proportional Hazard Model. The dependent variable is the Time to fail-camp and it represents the duration until firm failure after the first ECF campaign. From Model 17 to Model 20 we include separately the explanatory variables related to ECF campaigns' characteristics (Model 17), ECF campaigns' outcomes (Model 18), firms' and team's characteristics (Model 19) and follow-on funding (Model 20). Model 21 includes all the variables related to the characteristics and outcomes of the campaign, the firm' characteristics, and the teams' characteristics. Model 22 adds, to the previous model, a dummy variable for the success of the first ECF campaign. Model 23 includes all the explanatory variables of equation 2. Then, we split the sample, between firms with a successful first ECF campaign (Model 24) and firms with an unsuccessful first ECF campaign (Model 25). All models control for industry group (not reported). Coefficients reported are hazard ratios. Standard errors are reported in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Definitions of variables are reported in **Table 19**.

VARIABLES	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
Equity Retention	0.136** (0.120)				2.789 (2.861)	2.595 (2.668)	2.879 (2.934)	36.936 (82.227)	0.786 (0.945)
Nominee Structure	1.300** (0.166)				1.091 (0.140)	1.108 (0.139)	1.107 (0.142)	1.047 (0.244)	1.103 (0.175)
Target	0.791*** (0.059)				1.410*** (0.141)	1.389*** (0.140)	1.427*** (0.143)	1.65** (0.344)	1.273** (0.153)
% Funded		0.86 (0.130)			0.913 (0.145)	1.046 (0.218)	0.943 (0.148)	1.179 (0.304)	0.829 (0.354)
# Investors		0.998*** (0.001)			0.999** (0.001)	0.999** (0.001)	0.999** (0.001)	0.998** (0.001)	1.001 (0.001)
Large Investor		0.758* (0.120)			0.815 (0.129)	0.839 (0.135)	0.826 (0.131)	0.671* (0.151)	1.011 (0.239)
Firm Age			0.630*** (0.028)		0.620*** (0.028)	0.621*** (0.028)	0.622*** (0.028)	0.640*** (0.051)	0.610*** (0.034)
Positive Sales			0.983 (0.020)		0.995 (0.022)	0.996 (0.022)	0.997 (0.022)	1.112 (0.074)	0.979 (0.024)
Firm Size			1.016 (0.041)		1.023 (0.042)	1.018 (0.042)	1.021 (0.042)	0.801 (0.349)	1.024 (0.042)
Team Size			0.826*** (0.030)		0.819*** (0.031)	0.819*** (0.031)	0.830*** (0.032)	0.784*** (0.052)	0.846*** (0.043)
Av. Team Age			1.006 (0.007)		1.001 (0.007)	1.001 (0.007)	1.001 (0.007)	0.989 (0.014)	1.004 (0.008)
Female			0.869 (0.188)		0.874 (0.190)	0.880 (0.192)	0.887 (0.193)	0.916 (0.344)	0.773 (0.212)
Follow-on funding				0.366*** (0.070)			0.604** (0.120)	0.600* (0.165)	0.600* (0.173)
Success of 1 st ECF campaign						0.777 (0.206)			
Observations	950	950	950	950	950	950	950	475	475
LR chi2	19.29	47.09	249.9	36.08	281.30	282.19	288.53	94.19	178.29
Pseudo-r2	0.0057	0.0138	0.0734	0.0106	0.0826	0.0829	0.0848	0.9060	0.0895

However, before analysing the regression results, let's look at survival functions. As we can see in **Figure 5**, the survival function of firms decreases considerably more for the subsample of firms with an unsuccessful first ECF campaign, suggesting that the success of ECF campaigns increases the probability of firm survival.

Figure 5 - Kaplan-Meier survival curves



The results of the Cox proportional hazard model are similar to the probit model. Considering all the variables (model 23), except for the target amount and the number of investors, we do not find evidence that campaign characteristics and their outcomes significantly influence the hazard rate of firm failure. Yet, a higher number of crowd investors is associated with a lower hazard of firm failure (confirming our hypothesis H4b). Each crowd investor reduces the hazard of firm failure by 0,1%⁵¹.

Among firms' and teams' characteristics, we find evidence that firm age and team size significantly influence the hazard rates of firm failure. Older firms and firms with larger teams are associated with a higher duration until the failure event (lower failure rates). The probability of failure is reduced by 37.8% for firms one year older and by 17% for firms with one more person in their teams.

⁵¹ A hazard ratio between 0 and 1 means that is less likely for the failure event to happen and a hazard ratio greater than 1 means that it is more likely for the event to happen. A hazard rate of 0.8 [(1.2) means that for one increase in the independent variable, the probability of the event happening decreases by 20% (increases by 20%).

Obtaining follow-on financing has also a strong impact on firm failure. We find that a firm with follow-on funding shows 39.6% lower probability of failure in comparison to a firm without follow-on funding.

Comparing the results of firms with a successful first ECF campaign (model 24) and firms with an unsuccessful first ECF campaign (model 25), we find that the results remain quite similar to the probit analysis. The failure rate of firms with a first successful ECF campaign is significantly influenced by the outcomes of the first ECF campaign (number of investors and the presence of a large investor), the firm and team's characteristics (firm age and team size) and follow-on financing. However, for firms with a first ECF campaign unsuccessful, only the target amount of the campaign, the firm age, the team size and getting follow-on funding have a relevant impact on firm failure.

Overall, these results suggest that characteristics and outcomes of ECF campaigns and follow-on financing are relevant to firm failure but, for firms that cannot obtain ECF funding, the factors that most influence their failure rate are the firm's and team's characteristics, as well as getting follow-on funding. This way, in terms of failure rate, we only find support for our second (presence of a large investor) and fourth (number of investors) hypotheses in the subsample of firms with a first successful campaign. The survival of firms with a first unsuccessful ECF campaign depends essentially on their firm and team's characteristics, as well as their ability to get follow-on funding.

4.6. Discussion and conclusions

This paper investigated the follow-on funding and failure of firms with ECF campaigns (successfully or not). So, using a unique database, we started by investigating the behaviour of firms in terms of multiple ECF campaigns in the two major ECF platforms in the United Kingdom.

We found that although most companies involved in ECF campaigns only carry out one ECF, some of them perform multiple campaigns. During the first campaign, around half of the campaigns were successful, but firms that decided to run subsequent campaigns have higher success rates. The second campaign for firms with a successful first one is used to

finance their growth, while firms that failed the first campaign use the following campaigns to adjust the offering, by reducing the target amount and the price of the shares offered (lowering the pre-money valuation). These results suggest that, as in venture capital, entrepreneurs in ECF prefer phasing the funding to mitigate moral hazard problems ([Dahiya & Ray, 2012](#)), and that the information obtained in the firsts rounds are used to adjust their financing strategy ([Bergemann & Hege, 1998](#)).

In our paper, we also investigated the outcomes of start-ups after the first ECF campaign, both in terms of their ability to obtain subsequent rounds of financing and in terms of firm survival.

In our sample, after the first ECF campaign, around 23% of firms got follow-on funding in the form of SECO, VC/BA, M&A, or IPO. However, this percentage is higher for firms that were successful in their first ECF compared to firms with a first ECF unsuccessful. According to multivariate analysis, the factors that influence the probability of firms obtaining follow-on funding depend on the outcome of the first ECF campaign. Considering the full sample, we found that the presence of a nominee structure (H3a), the percentage funded (H4a) and the target amount of the ECF campaign significantly influence the probability of firms obtaining follow-on financing. Similarly to by [Signori and Vismara \(2018\)](#), we do not found evidence that equity retention (H1a) is relevant to follow-on funding and, as [Hornuf et al. \(2018\)](#) and [Hornuf et al. \(2019\)](#), we also do not found evidence that the number of crowd investors and the presence of large investors influence the probability of getting subsequent rounds of funding.

Nevertheless, we found different results when we split the sample into two groups, the firms with a successful first ECF campaign and firms with an unsuccessful first ECF campaign. The empirical results for the subsample of firms with the first ECF campaign unsuccessful are quite similar to the full sample. However, for firms funded in the first ECF, the probability of subsequent financing is only positively influenced by debt ratio and team size. Other characteristics of the ECF campaign and its outcomes seem to be irrelevant for the probability of follow-on funding.

Finally, we also analysed the failure rate of firms involved in the ECF campaign. When we use the full sample, we found empirical evidence that the probability of firm failure is

influenced by the outcomes of the ECF campaign, namely by the presence of a large investor (H2b) and the number of crowd investors (H4b). However, the characteristics of the first ECF campaign (except for the target amount), seem to be irrelevant for firm failure. We found that the equity offered (H1b), the use of a nominee structure (H3b) and the percentage funded do not influence significantly neither the probability of failure rate (probit model) nor the duration until the firm failure (Cox proportional hazard model). These results are still valid when we restricted the sample to successful firms in the first ECF offering and they are aligned with previous research for crowd-funded firms. [Signori and Vismara \(2018\)](#) also do not find evidence that equity offered (1-equity retention) influences firm failure. Like us, also [Signori and Vismara \(2018\)](#) concluded that the presence of qualified investors in the ECF offering reduces significantly the probability of firm failure. However, the results of previous research on the effect of the number of crowd investors on firm failure are not so clear. While some do not find a significant influence of the number of crowd investors on firm failure ([Hornuf et al., 2019](#); [Hornuf et al., 2018](#); [Signori & Vismara, 2018](#)), others, like us (for full sample and for the subsample of firms with a first ECF campaign successful), found a negative influence ([Bouaïss et al., 2020](#)).

However, when we used a subsample of unsuccessful firms (those that do not get the funding in their first ECF campaign), the results are quite different. None of the variables related to the characteristics and outcomes of the ECF seems to influence the post-offering failure rate of firms (except for the target amount in the Cox proportional hazard model). For this group of firms, among the variables included in our models, only the firm age, team size and follow-on funding influence significantly their failure rate after the first ECF campaign.

Nevertheless, these results confirmed the relevance of including firms with unsuccessful ECF campaigns in the research samples and that the conclusions of the previous research about the effect of the ECF campaigns on follow-on funding and firm failure could not be valid for firms with unsuccessful ECF campaigns.

We also investigated the effect of follow-on funding on firm failure. As expected, getting subsequent funding significantly reduces the probability of firm failing. In our sample, firms with follow-on funding show a 40% lower probability of failure in comparison to a firm

without follow-on funding. This result is valid for the full sample, as well as for the group of firms with a successful first ECF campaign. Our results suggest that firms can still survive independently of their difficulties in getting finance in their first ECF campaign if they can get the funding from a second ECF campaign or from other sources (VC/BA, M&A, or IPO).

In our study, we demonstrated that the conclusions of previous ECF research about post-campaign outcomes could be biased by the fact that they only include firms with successful ECF campaigns. Despite the relevant findings, we recognize that our research is not without limitations. First, due to financial data limitations on start-ups and small firms, we only analysed the subsequent funding in terms of equity sources (we do not have information about debt financing) and even for those financing sources, we do not distinguish the different equity sources (SECO, VC/BA, M&A, and IPO). Another limitation of our study is related to the research period. Our observation period occurs after the firm's first ECF campaign (and the most recent campaigns in our sample ended in October 2018) and lasts until the firm's failure or the end of our study's period (right censoring on the first months of 2021). This way, for some firms our time window is just a little over two years.

Thus, future research may benefit from including variables related to debt and different sources of equity, using a longer time window, as well as investigating other post-campaign outcomes such as capital structure and other firm performance indicators (e.g., sales and employment growth).

5. CONCLUSION

This thesis focuses on Equity Crowdfunding (ECF), a new alternative to funding for start-ups, and it includes three essays on this topic. The first one is a systematic review of literature about ECF. The second paper explores the determinants of ECF campaigns' success, focusing on the role of competition in campaign success. Finally, in the last essay, we investigate the follow-on funding and survival of firms with ECF campaigns (successfully or not).

In line with the growth of the ECF industry, in recent years, we have observed a growing interest in crowdfunding research, evidenced by the exponential growth of the number of documents published on this topic. Although there are some (few) papers of literature review of ECF, they are outdated and usually focused on a specific topic. Thus, our first essay provides a comprehensive and up-to-date systematization of the existing ECF literature, identifying some inconsistencies and gaps and providing clues for further investigation.

We used the guidelines proposed by [Tranfield et al. \(2003\)](#) to define a research protocol for the systematic literature review, according to which we selected 139 papers on ECF. Then, given the wide range of topics discussed in ECF literature, we organized the literature review according to the investment process. We started with a brief characterization of ECF, highlighting the main differences between traditional investors in start-ups (VC/BA) and crowd investors. Then, we explored why and when entrepreneurs prefer ECF over other sources of entrepreneurial finance. We also described the platform models of ECF and analysed how the differences across ECF platforms can influence the success of the campaigns and post-campaign firm outcomes. The literature review continues with a summary of the empirical research on the most explored topic in ECF – the determinants of campaigns' success. On this topic, we discussed the drivers of fundraising success related to (i) the supply side of the ECF market (campaigns), such as the signals of the quality of projects and entrepreneurs, the information disclosure, the non-financial rewards, and the dynamics of the investment process; (ii) the crowd investors-related factors, namely the investors' heterogeneity, investors' biases, and the relevance of constructing trust relations and offering risk options to crowd investors; and (iii) the country-level characteristics on ECF market development and investment decisions. The last chapter of the literature review

was dedicated to the post-investment phase, where we analysed the post-campaign outcomes regarding failure rate, follow-on funding, and firm performance.

Given the broad scope of the literature review, we think this document can be very useful for academics, as it provides a structured and organized review of the main contributions of previous research on ECF and identifies possible topics for future research. It could be also very useful for all the players in the ECF market: entrepreneurs, investors, platforms, and regulators. By identifying the factors that can contribute to the success of campaigns, this document provides useful information for entrepreneurs who intend to use this type of funding, helping them to adjust their funding strategy and campaign design and, therefore, increase the probability of funding success. It also allows identifying the circumstances in which ECF may be preferable to more traditional sources of start-ups' funding (namely venture capital and business angels), and the platform model that best suits their interests. This paper can also be relevant for platforms that are interested in selecting the best projects for their websites, which allows them to increase their profitability, both in the short term (given that platform performance is often associated with the success of campaigns) and long-term (reputation effect). Investors are also interested in knowing what criteria they should use to identify the projects that best fit their risk profile and which projects may have the best long-term performance after the campaigns have ended. Finally, this paper is also relevant for regulators who are interested in identifying possible sources of fraud and other strategies used by entrepreneurs and platforms that may threaten the interests of investors. These issues are particularly relevant because crowd investors are usually non-professional and with lower resources than VC/BA to allocate for the selection and monitoring of projects.

Despite the advantages and relevance of this literature review, it also has some limitations. Although we tried to include a systematic and comprehensive set of topics related to ECF's economic and financial issues, excluding other dimensions of this phenomenon such as marketing and regulation. Then, given our option to only include papers already published in scientific journals, we may have excluded other works with relevant contributions that have not completed the peer review process. Finally, while we have sought to provide an up-to-date and comprehensive review of the ECF literature if ECF research continues to grow as it has in recent years, this document could become outdated or incomplete.

The second and third essays of the thesis are empirical research where we investigate the role of competition on the performance of equity crowdfunding campaigns and what happens to firms after the first ECF campaign in terms of follow-on funding and firm survival.

Since there are no databases about crowdfunding campaigns and equity crowdfunding platforms only provide the public information available on their websites (which includes only the information about active campaigns and historical information about some of the successful campaigns), to construct our sample for these two empirical research, we (daily) hand-collected information about all campaigns ran on Crowdcube and Seedrs, two UK platforms, for more than three years (from April 7, 2015, to October 13, 2018). This way, we constructed a unique hand-collected database of 1,487 ECF campaigns. Compared to previous literature on ECF, our sample is larger and covers a longer period of ECF activity (around three and a half years). Then, as we collected data about all the campaigns from both platforms during that period, our database avoids any selection or survivor biases. Moreover, we collected exhaustive information about the campaigns, the firms and project teams, which allowed us to carry out a very detailed characterization of equity crowdfunding in the UK, the most relevant equity crowdfunding market in Europe. This database is used in both empirical essays of this thesis.

Our second essay (chapter 3 of the thesis) extends competition research into fundraising, arguing that competition may influence the outcomes of equity crowdfunding campaigns as well. First, we explore the effect of competition on the outcome at the end of the campaign (funded or not funded). Then, we analyse the role of competition during the campaign. As in some of the previous papers on equity crowdfunding, we study the determinants of campaign success. However, to the best of our knowledge, this is the first paper focused on the role of competition in equity crowdfunding campaigns.

According to the literature review, we formulate two hypotheses. For the first one, we assumed that the availability of financial funding is limited and that the ECF market can be viewed as a zero-sum game. This way, if a campaign attracts more funding, the other projects may end up with less ([Lin et al., 2018](#)) and therefore, the higher the competitive intensity in equity crowdfunding platforms, the lower the probability of a campaign being successful.

For the second one, we take into consideration the effect of the presence of “Blockbuster Projects”, i.e., widely visible, and popular projects (with many backers). According to the empirical evidence of other crowdfunding models, these Blockbuster Projects” can steal potential backers from other projects ([J. Block et al., 2018](#)). However, considering that crowdfunding platforms operate as two-sided markets ([Thies et al., 2018](#)), we hypothesized that blockbuster projects exhibit positive spillover effects on projects in the same category (industry) but cannibalization effects on projects in other categories (other industries).

Although we do not find empirical evidence that clearly supports the hypothesis that the number of competing campaigns significantly influences the probability of a campaign being funded, it is relevant for the number of investors and the amount raised daily. Moreover, our results also suggest that the presence of blockbuster projects has a cannibalization effect on campaigns from other industries, stealing investors and reducing the likelihood that a campaign will be successful, following our second hypothesis.

This study confirms the relevance of the competitive environment for the financing strategy of investors, providing clues on how they can increase the probability of success of ECF campaigns, namely the best time to start or exit the ECF campaign and how to attract the attention of potential funders. However, we recognize that it has some limitations that can be suppressed in future research. Those limitations are related to the sample used and the scope of competition. Our sample only includes campaigns accepted for online publishing on Crowdcube and Seeds platforms. So, it excludes the ECF campaigns not selected by the platforms during the pre-selection phase or those that, after being launched in private mode, failed to attract the attention needed to be released online. Another limitation of our paper is related to the competition scope. Our research is limited to the equity crowdfunding market. However, those who invest in equity crowdfunding may also invest in venture capital or other capital markets. This way, future research can focus the analysis on the factors that influence the pre-selection of the campaigns by the platforms, and the competition before campaigns are released online and may use a broader definition of competition that includes other capital markets.

Our last essay, presented in chapter 4 of the thesis, explored the follow-on funding and survival of firms previously involved in ECF campaigns. This paper extended the previous

research on post-campaign outcomes in ECF by including for the first time, to our knowledge, firms that were not successful in their ECF campaigns (previous research relies only on successful equity crowdfunded firms), avoiding any selection bias related to the unsuccess of campaigns or crowdfunded firms that went to bankruptcy and subsequently suppressed from platforms databases. We also use a much larger dataset of ECF campaigns than previous studies.

Based on the literature review, we formulate four double hypotheses. We argue that the characteristics of ECF campaign, such as high equity retention (H1) and the presence of a large (institutional) investor in equity-crowdfunding campaigns (H2) are effective signals of the quality of firms, facilitating the obtention of follow-on funding (H1a and H2a), and could be associated with higher survival rates of firms (H1b and H2b). We also propose that in comparison to the direct shareholder model, the nominee structure can be more effective to deal with moral hazard issues, reducing the coordination costs associated with a high shareholder dispersion, and avoiding the free rider problems, related to the lower incentives of individual crowd investors to monitor the firms. This way, we argue that the use of a nominee shareholder model in the ECF campaign (in opposition to a direct model) increases the probability of the firm getting follow-on funding (H3a) and reduces the probability of firm failure (H3b). In our last hypothesis we argue that firms with positive outcomes of the ECF campaigns are associated with a higher probability of getting follow-on funding (H4a) and a lower rate of failure (longer time until failure) (H4b).

According to the descriptive analysis, we found that around 22.9% of firms in our sample got follow-on funding after the ECF campaign and that such percentage is higher for firms that were successful in their first ECF (32.7%) than for firms with a first ECF unsuccessful (13.1%). We also identified that, while the second campaign of firms with a successful first ECF campaign is used to finance the firm's growth, those that fail the first ECF campaign use the following campaigns to adjust the offering, by reducing the target amount and lowering the pre-money valuation. Moreover, at the time of our study, 67% of the firms in our sample are still active, while almost 30% have been dissolved, are in liquidation or have an insolvency proceeding open. We also found that even though the survival rate of firms with at least one successful campaign (80%) is significantly higher than the firms that failed

all the ECF campaigns (53%), 64% of firms with only unsuccessful campaigns are still active three years after the first campaign.

In the multivariate analysis we investigated the factors that influence the follow-on funding and the firm's survival. Using the full sample, our empirical results suggest that some of the characteristics and outcomes of the ECF campaign (the target amount, the nominee shareholder structure and the percentage funded) influence the ability of firms to get follow-on funding. However, when we split the sample between the firms that were successful in the first ECF campaign and those that were not, we found that the results are not the same for both subsamples. For the group of firms that were successful in their first ECF campaign, we found that the characteristics and outcomes of ECF campaigns do not significantly influence the probability of getting follow-on funding, which depends essentially on the firm's debt ratio and team size. However, we found that for the subsample of firms that failed the first ECF campaign, having a high target amount and a high percentage of funding raised significantly improved the probability of getting follow-on funding.

In this paper, we also analysed the failure rate of firms involved in ECF. We found empirical evidence that the firm failure is influenced by the number of crowd investors, the presence of a large investor in ECF campaigns, and by the ability to get subsequent funding. These results remained similar when we restricted the sample to firms with the first ECF campaign, which is aligned with previous research for crowdfunded firms. However, the empirical results are different when we restrict the analysis to the subsample of unsuccessful firms in the ECF campaign. Except for the shareholder structure, none of the other variables related to the characteristics and outcomes of the ECF seems to influence the post-offering failure rate of firms. For firms that couldn't get funding from the first ECF campaign only the firm age, team size and getting follow-on funding influence significantly their failure rate after the campaign.

In this study we confirmed the relevance of including in the sample firms with unsuccessful ECF campaigns and that the conclusions of the previous research about the effect of ECF on firm failure are not valid for firms with unsuccessful ECF campaigns.

Despite the relevant findings, our research has some limitations. First, given that our sample includes essentially start-ups and small companies, the financial data available is limited. For instance, we do not have information about debt financing, so we only analysed the subsequent funding in terms of equity sources, and even for those, we do not distinguish the different equity sources (SECO, VC/BA, M&A, and IPO). Second, for some firms, our time window is just a little over two years (between October 2018 – the date of the last ECF campaigns - and February 2021 – the date that we retrieved the data about firm failure). This way, we propose that future research could benefit from the inclusion of debt financing variables, the exploration of the effect of capital structure on follow-on funding and firm failure analyses, and the investigation of other firm performance indicators (e.g., sales and employment growth). Future research can also benefit from using a longer time window.

Overall, we expect that our thesis contributes to a better understanding of the ECF market, a recent alternative for start-ups' funding. Beyond an updated and extensive systematic review of literature about ECF, we provided two novel empirical contributions to ECF research. First, we explored the determinants of ECF campaigns' success focusing for the first time, to our knowledge, on the role of competition in the campaign's success. Second, we also investigated follow-on funding and the failure of firms with ECF campaigns. Contrary to previous research that only included firms with successful campaigns, our sample also included firms with unsuccessful ECF campaigns, which is relevant because the factors that influence the ability of firms to get follow-on funding and survival are not the same for the groups of firms. Despite the relevant contributions of our essays, we also identified some limitations and avenues for future research.

APPENDICES

Appendix 1 - Pairwise correlation matrix

Variables: (1) Funded; (2) #Camp_platf ; (3) #Camp_platf_ind; (4) #Camp_market; (5) #Camp_market_ind; (6) #BB_platf; (7) #BB_platf_ind; (8) #BB_platf_other ind; (9) #BB_market_ind; (10) #BB_market_ind; (11) #BB_market_other ind; (12) Equity retention; (13) Presence of a large investor; (14) Firm age; (15) Firm value; (16) Team size; (17) Qualifications/Experience; (18) Updates; (19) Q&A; (20) Tax reliefs; (21) Non-financial rewards; (22) Early investments. Number of observations in brackets. * p<0.1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	
(1)	1.00 1487																						
(2)	-0.0931* 1407	1.00 1407																					
(3)	-0.0659* 1374	0.3645* 1374	1.00 1374																				
(4)	-0.0380 1407	0.6858* 1407	0.2447* 1374	1.00 1407																			
(5)	-0.0531* 1374	0.2071* 1374	0.8888* 1374	0.2742* 1374	1.00 1374																		
(6)	-0.0273 1407	0.1367* 1407	0.0323 1374	0.1263* 1374	0.0224 1374	1.0000 1407																	
(7)	0.0538* 1374	-0.0908* 1374	-0.0331 1374	-0.1001 1374	-0.0355 1374	0.3161* 1374	1.00 1374																
(8)	-0.0528* 1374	0.1794* 1374	0.0482* 1374	0.1761* 1374	0.0389 1374	0.9112* 1374	-0.1028* 1374	1.00 1374															
(9)	-0.0146 1407	0.0999* 1407	0.0240 1374	0.1223* 1407	0.0145 1374	0.6043* 1407	0.1836* 1374	0.5556* 1407	1.00 1407														
(10)	0.0802* 1374	-0.0554* 1374	-0.0025 1374	-0.0547* 1374	-0.0276 1374	0.2347* 1374	0.7587* 1374	-0.0833* 1374	0.3024* 1374	1.00 1374													
(11)	-0.0524* 1374	0.1297* 1374	0.0261 1374	0.1527* 1374	0.0257 1374	0.5450* 1374	-0.0966* 1374	0.6134* 1374	0.9318* 1374	- 0.0641*	1.00 1374												
(12)	0.1917* 1487	0.0608* 1407	0.0013 1374	0.0004 1407	-0.0006 1374	0.0161 1407	0.0173 1374	0.0228 1374	-0.0168 1407	0.0162 1374	-0.0249 1374	1.0000 1487											
(13)	0.4528* 1254	-0.0289 1231	-0.0183 1206	-0.0148 1231	0.0170 1206	-0.0378 1231	-0.0402 1206	-0.0131 1206	-0.0584* 1231	- 0.0496*	-0.0410 1206	0.1706* 1254	1.00 1254										
(14)	-0.0030 1487	-0.0408 1407	-0.0515* 1374	0.0002 1407	-0.0543* 1374	0.0373 1407	0.0251 1374	0.0328 1374	0.1078* 1407	0.0398 1374	0.0964* 1374	0.1209* 1487	-0.0078 1254	1.00 1487									
(15)	0.1348* 1487	-0.0047 1407	-0.0869* 1374	-0.0063 1407	-0.0935* 1374	0.0296 1407	0.0454* 1374	0.0090 1374	0.0466* 1407	0.0508* 1374	0.0275 1374	0.3453* 1487	0.1015* 1254	0.1744* 1487	1.00 1487								

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(16)	0.1543*	-0.0251	-0.0240	0.0145	-0.0133	0.0763*	0.0433	0.0579*	-0.0410	-0.0161	-0.0416	0.1823*	0.1138*	0.0927*	0.2094*	1.00						
(17)	1445	1367	1338	1367	1338	1367	1338	1338	1367	1338	1338	1445	1221	1445	1445	1445						
(17)	-0.0435*	0.0237	0.0405	0.1088*	0.0513*	-0.1527*	-0.0926*	-0.1130*	0.2787*	0.0283	0.2882*	-0.0701*	-0.0576*	0.0453*	-0.0057	-0.1838*	1.00					
(18)	1454	1374	1343	1374	1343	1374	1343	1343	1374	1343	1343	1454	1223	1454	1454	1445	1454					
(18)	0.3029*	-0.1476*	-0.0818*	-0.0812*	-0.0540*	0.0533*	0.0418	0.0509*	0.2802*	0.0777*	0.2647*	0.0170	0.0830*	0.0846*	0.1198*	0.0847*	0.1966*	1.00				
(19)	1138	1138	1114	1138	1114	1138	1114	1114	1138	1114	1114	1138	1113	1138	1138	1136	1138	1138				
(19)	0.3523*	-0.0158	-0.0871*	-0.0894*	-0.1181*	-0.0004	0.1090*	-0.0458	0.0851*	0.0963*	0.0481	0.2045*	0.1225*	0.1150*	0.5667*	0.1782*	0.0388	0.3056*	1.00			
(20)	1139	1139	1115	1139	1115	1139	1115	1115	1139	1115	1115	1139	1111	1139	1137	1139	1133	1139				
(20)	0.0506*	-0.0915*	0.0232	0.0025	0.0623*	-0.1106*	-0.0072	-0.1045*	-0.0177	0.0210	-0.0286	-0.1128*	-0.0072	-0.0691*	-1766*	-0.0550*	0.0628*	0.0294	-0.0752*	1.00		
(21)	1487	1407	1374	1407	1374	1407	1374	1374	1407	1374	1374	1487	1254	1487	1487	1445	1454	1138	1139	1487		
(21)	0.0429	-0.1831*	-0.1276*	-0.0095	-0.0838*	-0.0827*	0.0062	-0.0858*	0.3037*	0.0833*	0.2876*	-0.0914*	-0.0683*	0.0954*	0.0294	-0.0144	0.3415*	0.3040*	0.1256*	0.0426	1.00	
(22)	1438	1360	1331	1360	1331	1360	1331	1331	1360	1331	1331	1438	1218	1438	1438	1436	1438	1134	1135	1438	1438	
(22)	0.4872*	-0.0301	-0.0508*	-0.0487*	-0.0490*	-0.1002*	0.0493*	-0.1263*	-0.0689*	0.0597*	-0.1061*	0.2057*	0.3198*	0.0451*	0.2177*	0.1259*	-0.0618*	0.0103	0.3218*	-0.0251	-0.0160	1.00
(22)	1487	1407	1374	1407	1374	1407	1374	1374	1407	1374	1374	1487	1254	1487	1487	1445	1454	1138	1139	1487	1438	1487

Appendix 2 - Frequency distribution of crowdfunding campaigns by firm country

Country	Frequency	Percent
United Kingdom	1,356	93.52
Spain	26	1.79
Portugal	17	1.17
Germany	12	0.83
Ireland	9	0.62
Netherlands	6	0.41
United States	6	0.41
France	2	0.14
Isle of Man	2	0.14
Norway	2	0.14
Sweden	2	0.14
Switzerland	2	0.14
Australia	1	0.07
Austria	1	0.07
Belgium	1	0.07
Czech Republic	1	0.07
Luxembourg	1	0.07
Malta	1	0.07
Malta, United Kingdom	1	0.07
United Arab Emirates	1	0.07
Total	1,450	100.00

Appendix 3 - Frequency distribution of crowdfunding campaigns by industry

Industry	Freq.	Percent
Information and communication	396	27.83
Wholesale and retail trade; repair of motor vehicles and motorcycles	241	16.94
Manufacturing	210	14.76
Administrative and support service activities	118	8.29
Professional, scientific, and technical activities	103	7.24
Accommodation and food service activities	83	5.83
Financial and insurance activities	52	3.65
Arts, entertainment, and recreation	50	3.51
Others	170	11.95
Total	1,423	100.00

Appendix 4 - The effect of competition on the number of investors in campaign i

Models (17) to (24) use the Negative Binomial Regression Model (NBRM)⁵² and the number of investors as dependent variables. Model (17) to (20) includes only the variables related to competition (number of competing campaigns, number of blockbuster projects), during the first week of the campaign, and they differ by the definition of the relevant market (all the campaigns on the same platform for models (17) and (21); campaigns on the same platform within the same industry for models (18) and (22); all the campaigns on both platform for models (19) and (23) and campaigns on both platform within the same industry for models (20) and (24)). Models (21) to (24) differ by the competition variables used and include the control variables (equity retention, presence of a large investor, firm age, firm value, team size, qualification/ experience of the team, updates, Q&A, tax reliefs, other non-financial rewards, early investments). All the variables are defined in Table 13. Standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	(17) N° investors	(18) N° investors	(19) N° investors	(20) N° investors	(21) N° investors	(22) N° investors	(23) N° investors	(24) N° investors
#Camp_platf	-0.019*** (0.003)				-0.012*** (0.002)			
#BB_platf	0.146*** (0.026)				0.040** (0.018)			
#Camp_platf_ind		-0.053*** (0.008)				-0.018*** (0.005)		
#BB_platf_ind		0.373*** (0.066)				0.189*** (0.042)		
#BB_platf_other ind		0.088*** (0.026)				-0.000 (0.018)		
#Camp_market			-0.011*** (0.003)				-0.004** (0.002)	
#BB_market			0.023 (0.022)				0.032** (0.014)	
#Camp_market_ind				-0.029*** (0.005)				-0.007** (0.003)
#BB_market_ind				0.229*** (0.048)				0.134*** (0.031)
#BB_market_other ind				-0.020 (0.022)				0.012 (0.014)
Equity retention					0.262 (0.299)	-0.024 (0.297)	0.085 (0.302)	-0.035 (0.298)
Large investor					0.136*** (0.039)	0.134*** (0.038)	0.140*** (0.039)	0.137*** (0.038)
Firm age					0.008 (0.005)	0.008 (0.005)	0.010* (0.006)	0.009 (0.005)
Firm value					0.000* (0.000)	0.000 (0.000)	0.000** (0.000)	0.000 (0.000)
Team size					0.046*** (0.008)	0.049*** (0.008)	0.048*** (0.008)	0.048*** (0.008)
Qualification/Experience					-0.064 (0.047)	-0.036 (0.047)	-0.039 (0.047)	-0.021 (0.046)
#Updates					0.032*** (0.003)	0.035*** (0.003)	0.035*** (0.003)	0.036*** (0.003)
#Q&A					0.042*** (0.002)	0.040*** (0.002)	0.041*** (0.002)	0.040*** (0.002)
Tax reliefs					0.102* (0.055)	0.065 (0.055)	0.123** (0.055)	0.076 (0.056)
Non-financial rewards					0.104** (0.042)	0.098** (0.041)	0.149*** (0.041)	0.117*** (0.041)
Early investments					0.822*** (0.052)	0.909*** (0.052)	0.834*** (0.052)	0.919*** (0.053)
Observations	1,407	1,374	1,407	1,374	1,103	1,081	1,103	1,081
Pseudo R ²	0.003	0.0046	0.001	0.004	0.0974	0.1007	0.0957	0.1002
Log-likelihood	-9,100.60	-8,890.28	-9,118.84	-8,895.84	-6,552.92	-6,406.27	-6,565.37	-6,410.13

⁵² In our sample, the Poisson model is not adequate because of the presence of overdispersion. The mean number of investors is 223 and its variance is 123,781, so the variance is 555 times higher than the mean.

Appendix 5 - The effect of competition on the percentage raised of the campaign i

Models (25) to (32) use the Ordinary Least Squares Model (OLS) and the percentage raised at the end of the campaign as dependent variables. Model (25) to (28) includes only the variables related to competition (number of competing campaigns, number of blockbuster projects), during the first week of the campaign, and they differ by the definition of the relevant market (all the campaigns on the same platform for models (25) and (29); campaigns on the same platform within the same industry for models (26) and (30); all the campaigns on both platform for models (27) and (31) and campaigns on both platform within the same industry for models (28) and (32)). Models (29) to (32) differ by the competition variables used and include the control variables (equity retention, presence of a large investor, firm age, firm value, team size, qualification/ experience of the team, updates, Q&A, tax reliefs, other non-financial rewards, early investments). All the variables are defined in **Table 13**. Standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	(25) Perc. Raised	(26) Perc. Raised	(27) Perc. Raised	(28) Perc. Raised	(29) Perc. Raised	(30) Perc. Raised	(31) Perc. Raised	(32) Perc. Raised
#Camp_platf	-0.007*** (0.003)				-0.002 (0.002)			
#BB_platf	-0.017 (0.020)				-0.013 (0.014)			
#Camp_platf_ind		-0.015*** (0.005)				-0.003 (0.004)		
#BB_platf_ind		0.144*** (0.050)				0.039 (0.032)		
#BB_platf_other ind		-0.043** (0.019)				-0.031** (0.014)		
#Camp_market			-0.004* (0.002)				0.002 (0.001)	
#BB_market			-0.043*** (0.016)				-0.009 (0.011)	
#Camp_market_ind				-0.007** (0.003)				-0.002 (0.002)
#BB_market_ind				0.073** (0.035)				0.021 (0.023)
#BB_market_other ind				-0.054*** (0.015)				-0.016 (0.011)
Equity retention					1.445*** (0.228)	1.485*** (0.228)	1.416*** (0.228)	1.489*** (0.228)
Large investor					0.257*** (0.029)	0.296*** (0.030)	0.257*** (0.029)	0.298*** (0.030)
Firm age					-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)
Firm value					-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Team size					0.002 (0.006)	0.005 (0.006)	0.002 (0.006)	0.005 (0.006)
Qualification/Experience					-0.010 (0.035)	-0.013 (0.035)	-0.031 (0.035)	-0.029 (0.035)
#Updates					0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.002)
#Q&A					0.013*** (0.001)	0.014*** (0.001)	0.014*** (0.001)	0.014*** (0.001)
Tax reliefs					0.000 (0.041)	0.029 (0.042)	0.005 (0.041)	0.031 (0.042)
Non-financial rewards					0.022 (0.032)	0.044 (0.031)	0.023 (0.031)	0.033 (0.031)
Early investments					1.074*** (0.027)	0.925*** (0.034)	1.074*** (0.027)	0.925*** (0.035)
Observations	1,407	1,374	1,407	1,374	1,103	1,081	1,103	1,103
R ²	0.007	0.016	0.008	0.017	0.733	0.657	0.733	0.656

Appendix 6 - The effect of competition on the success of equity crowdfunding campaign

This table reports logistic regressions for the effect of competition on fundraising success. The dependent variable assumes the value of 1 if the campaign is successful (funded) and 0, otherwise. Model (33) to (36) includes only the variables related to competition (HHI, number of blockbuster projects), during the first week of the campaign. Models (37) to (40) also control for other variables that, according to the literature review, influence fundraising success. The models also differ in terms of the definition of relevant competitive market: all the campaigns on the same platform for models (33) and (37); campaigns on the same platform within the same industry for models (34) and (38); all the campaigns on both platform for models (35) and (39) and campaigns on both platform within the same industry for models (36) and (40). All the variables are defined in **Table 13**. Standard errors are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	(33) Funded	(34) Funded	(35) Funded	(36) Funded	(37) Funded	(38) Funded	(39) Funded	(40) Funded
HHI_platf	-2.514** (1.146)				0.071 (2.428)			
#BB_platf	-0.027 (0.048)				-0.188** (0.092)			
HHI_platf_ind		0.158 (0.205)				0.418 (0.371)		
#BB_platf_ind		0.418*** (0.146)				0.345 (0.253)		
#BB_platf_other ind		-0.089* (0.051)				-0.262*** (0.097)		
HHI_market			-0.867 (0.858)				2.371 (1.765)	
#BB_market			-0.037 (0.039)				-0.104 (0.073)	
HHI_market_ind				0.047 (0.227)				0.347 (0.408)
#BB_market_ind				0.179* (0.099)				0.099 (0.168)
#BB_market_other ind				-0.074* (0.042)				-0.135* (0.078)
Equity retention					3.649** (1.589)	3.797** (1.604)	3.906** (1.597)	3.705** (1.594)
Large investor					1.251*** (0.196)	1.292*** (0.199)	1.275*** (0.199)	1.296*** (0.198)
Firm age					-0.059** (0.029)	-0.062** (0.029)	-0.059** (0.029)	-0.065** (0.029)
Firm value					-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Team size					0.035 (0.042)	0.039 (0.042)	0.039 (0.042)	0.045 (0.042)
Qualification/Experience					0.081 (0.239)	0.166 (0.243)	-0.030 (0.234)	-0.034 (0.235)
#Updates					0.099*** (0.016)	0.103*** (0.016)	0.095*** (0.015)	0.099*** (0.016)
#Q&A					0.073*** (0.013)	0.073*** (0.014)	0.075*** (0.013)	0.075*** (0.014)
Tax reliefs					0.225 (0.286)	0.243 (0.291)	0.235 (0.287)	0.241 (0.292)
Non-financial rewards					0.231 (0.218)	0.229 (0.221)	0.131 (0.213)	0.111 (0.214)
Early investments					6.110*** (0.530)	6.046*** (0.531)	6.099*** (0.529)	5.995*** (0.529)
Observations	1,407	1,374	1,407	1,374	1,103	1,081	1,103	1,081
Pseudo R ²	0.0027	0.0068	0.0011	0.0038	0.5108	0.5105	0.5103	0.5054
Log-likelihood	-970.74	-943.26	-972.32	-945.10	-365.86	-358.28	-366.22	-362.05

Appendix 7 - Comparison of descriptive statistics between the firms with successful and unsuccessful first campaign

This table compares firms successfully funded in their first ECF campaign (G1) with firms with unsuccessfully first ECF campaign (G2). The last column reports the t-tests on the differences between the two groups of firms. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. All variables are described in *Table 19*.

Variable	Firms successfully funded in their first ECF campaign (G1)		Firms with unsuccessfully first ECF campaign (G2)		Mean Diff (G1-G2)
	N	Mean	N	Mean	
Failure	659	0.47	666	0.20	0.27***
Time to fail -incorp	659	6.57	666	7.10	-0.53***
Time to fail-camp	659	3.16	666	3.72	-0.56***
Follow-on funding	659	0.13	666	0.33	-0.20***
Target	659	287	666	365	-78***
Equity Retention	659	0.87	666	0.89	-0.02***
Nominee structure (1/0)	651	0.45	661	0.40	0.05*
Firm Value	659	3,047	666	5,161	-2113***
Success (1/0)	659	0.00	666	1.00	-1.00
% Funded	659	0.33	666	1.52	-1.19***
# Investors	659	72	666	388	-316***
Large Investor (1/0)	659	0.2	666	0.67	-0.46***
Firm Age	659	6.69	666	7.17	-0.48***
Debt ratio	509	0.43	611	0.14	0.29
Firm Size	509	507	611	743	-236
Team Size	655	3.44	666	5.92	-2.49***
Av. Team Age	634	42.98	653	41.85	1.13**
Female	655	0.2	666	0.19	0.00

Appendix 8 - Pairwise correlation matrix

This table reports the pairwise correlation matrix. * denotes statistical significance at the 1% level. All variables are described in **Table 19**.

	Failure (1/0)	Time to Fail _incorp	Time to Fail _camp	Target	Equity Retention	Nominee Structure (1/0)	% Funded	# Investors	Large Investor (1/0)	Firm Age	Firm Size	Debt ratio	Team Size	Av. Team Age	Female	Follow-on funding
Failure (1/0)	1															
Time to Fail-incorp	-0.3549*	1														
Time to Fail-camp	-0.6057*	0.3785*	1													
Target	-0.1293*	0.2757*	-0.0231	1												
Equity Retention	-0.1089*	0.1385*	0.0206	-0.0316	1											
Nominee Struct. (1/0)	0.0647*	-0.0838*	-0.0010	-0.1144*	0.1166*	1										
% Funded	-0.2611*	0.1263*	0.1526*	0.0933*	0.2469*	-0.0594*	1									
# Investors	-0.2136*	0.2167*	0.0461*	0.4492*	0.1925*	-0.1054*	0.5619*	1								
Large Investor (1/0)	-0.1847*	0.0666*	0.0784*	0.0660*	0.1257*	-0.0211	0.4609*	0.1385*	1							
Firm Age	-0.3136*	0.9901*	0.3385*	0.2825*	0.1415*	-0.0865*	0.1196*	0.2092*	0.0535*	1						
Firm Size	-0.2461*	0.3541*	0.1053*	0.4538*	0.2216*	-0.0825*	0.3397*	0.3593*	0.1896*	0.3666*	1					
Debt ratio	-0.0154*	0.0248*	-0.0320	0.0409	0.0504*	0.0273	0.0020	-0.0013	-0.0139	0.0244	-0.0012	1				
Team Size	-0.2329*	0.2900*	0.1778*	0.4136*	0.1673*	-0.0195	0.2591*	0.3953*	0.1402*	0.2823*	0.3661*	0.0438	1			
Av. Team Age	-0.0620*	0.2544*	0.0125	0.2383*	0.0306	-0.0435	-0.0206	0.0706*	0.0059	0.2587*	0.2140*	0.0454	0.1480*	1		
Female	-0.0262	0.0752*	0.0201	-0.0420	-0.0051	-0.0575*	-0.0053	-0.024	0.0010	0.0716*	0.0173	-0.0071	0.0407	-0.0277	1	
Follow-on funding	-0.2121*	0.0854*	0.1852*	0.1922*	0.0625*	0.0275	0.2470*	0.2399*	0.1195*	0.0784*	0.1953*	-0.0185	0.2462*	-0.0201	0.015	1

Appendix 9 - Collinearity Diagnostics

This table reports the collinearity statistics. All variables are described in **Table 19**.

Variable	VIF	SQRT VIF	Tolerance	R-Squared
Target (ln)	1.87	1.37	0.54	0.46
Equity Retention (%)	1.16	1.08	0.86	0.14
Nominee structure (1/0)	1.08	1.04	0.93	0.07
% Funded	2.17	1.47	0.46	0.54
# Investors (number)	2.11	1.45	0.47	0.53
Large Investor (1/0)	1.33	1.15	0.75	0.25
Firm Age (years)	1.27	1.13	0.79	0.21
Firm Size (ln assets)	1.65	1.28	0.61	0.39
Debt ratio (%)	1.01	1.00	0.99	0.01
Team Size (number)	1.53	1.24	0.65	0.35
Av. Team Age (years)	1.13	1.06	0.89	0.11
Female (%)	1.02	1.01	0.98	0.02
Follow-on Funding (1/0)	1.14	1.07	0.88	0.12
Industry	1.06	1.03	0.94	0.06
Mean VIF	1.39			

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