

Sustainability in Equity Crowdfunding

Silvio Vismara *

University of Bergamo, Italy;

viale Marconi 5, 24044 Dalmine (BG), Italy.

Ph. +39.035.2052352.

Email: silvio.vismara@unibg.it

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ABSTRACT

Existing studies on the relationship between sustainability and crowdfunding are focused on campaigns that provide rewards for backers. Equity crowdfunding is substantially different in terms of motivations to invest as well as in size, horizon, and expectations of the investment. For the first time – using a sample of 345 initial equity offerings in United Kingdom platforms Crowdcube and Seedrs in the period 2014-2015 – this study provides evidence of the attractiveness of sustainability-oriented ventures in equity crowdfunding. Results show that, although sustainability orientation does not increase the chances of success or of engaging professional investors, it attracts a higher number of restricted investors. This evidence is interpreted considering institutional logic, whereas professionals follow a market logic, and restricted investors consider also a community logic.

Key words: Crowdfunding, Equity Crowdfunding, Sustainability, Crowdcube, Seedrs, Entrepreneurial finance.

1. INTRODUCTION

Sustainability-oriented companies are a key element of a sustainable global society. These type of companies do not rely on the private exploitation of public resources such as the environment, or the health and dignity of individuals. While this attribute can attract ethical investors, it might not be perceived positively by other types of investors. As a consequence, sustainability-oriented companies have traditionally found it difficult to raise external capital (Ortas et al., 2013). Fortunately, the emergence of new financial instruments and markets might foster sustainability by easing the financial challenges faced by such ventures.

Methods of financing sustainability-oriented firms is of growing interest to both policy-makers and researchers in a number of academic fields, including environmental studies, management, finance, and business ethics. One of the main changes is the emergence of crowdfunding as a relevant source of capital, especially for small business activities (Block et al., 2017). Crowdfunding is an umbrella term used to describe diverse forms of fundraising – typically via the Internet – whereby groups of people pool money to support a particular goal (Ahlers et al., 2015). There are four main types of crowdfunding namely reward-based, donation-based, lending-based, and equity-based crowdfunding.

First, in reward-based crowdfunding projects, proponents, which are either individuals or companies, look for financial contributions from a crowd of backers. The reward is the delivery of a (sometimes customized) product or service. This type of crowdfunding is therefore of interest especially for marketing and consumer studies. The largest reward-based crowdfunding platforms are Kickstarter (over \$ 3.5 billion raised by over 14 million backers, up to February 2018) and Indiegogo (800,000 ideas funded by over 9 million backers). Second, in donation-based crowdfunding, individuals or non-governmental organizations raise money for a cause, without a

material delivery to donors. Gogetfunding and Giveforward, for example, host campaigns to raise money online for personal causes, such as for helping friends and family in times of need. Experiment, instead, is a donation-based platform for funding and sharing scientific discoveries of universities and research institutions. Third, in lending-based crowdfunding lenders receive fixed interest rates for their loans. This type of crowdfunding can take a variety of different forms, ranging from peer-to-peer lending (the platform Kiva has already raised over \$1 billion in loans from over 1.7 million lenders worldwide) to invoice crowdfunding (the volume of invoices funded in MarketInvoice is approximately £2 million). Lastly, and central to entrepreneurial finance, is the fourth type of crowdfunding, equity-based crowdfunding. Equity crowdfunding, on which we will focus on in this study, is a form of financing in which entrepreneurs make an open call to sell a specific amount of equity in his/her company on the Internet. Cumming and Zhang (2016) and Rossi and Vismara (2016) provide a list of equity crowdfunding platforms in America and in Europe and document the services they provide.

For several reasons, equity crowdfunding is of particular interest when studying how to finance sustainability-oriented companies. The first reason addresses motivation to invest. Backers in crowdfunding consider not only tangible rewards, but also societal ones. As highlighted by Cumming et al. (2017), crowdfunding is able to finance companies that produce goods that have non-rival and non-excludable properties, such as those that are sustainability-oriented. A second motivation to study sustainability in crowdfunding is related to the amount of a single investment in crowdfunding being smaller than in traditional entrepreneurial financial markets. Market participants are indeed typically less risk-averse for low levels of investments, but more risk-averse for higher amounts (Pahlke et al., 2015). The small “capital at stake” required to invest in crowdfunding makes the risk of negative outcomes more tolerable. Third, while traditional private

deals are limited to a relatively small group of private investors, crowdfunding allows issuers to solicit and advertise their securities broadly to the public, thereby increasing the diversity of investors. Hence, equity crowdfunding campaigns attract small and professional investors alike. As these two types of investors have been found to have different investment preferences (Signori and Vismara, 2017), their attitude towards sustainability is likely to be different. This creates the opportunity to disentangle different perceptions of sustainability among of investors.

Recent studies have investigated how sustainability-oriented or green ventures perform in reward-based crowdfunding (e.g. Calic and Mosakowski, 2016; Horish, 2015), but this is the first study to address the question in equity-based crowdfunding. The study is based on a dataset that consists of the full population of 345 initial equity offerings listed in the period 2014-2105 on two of the world's largest equity crowdfunding platforms, Crowdcube and Seedrs. This delivers a large sample that allows us to fully exploit the heterogeneity of investors in equity crowdfunding, and to investigate different predispositions toward sustainability. Professional investors mainly invest in crowdfunding with the aim to actualize a monetary return (Vismara, 2016). We find that a sustainability orientation of the campaigns does not attract their investments. On the contrary, sustainability results in higher number of restricted investors. We posit that while professional investors follow a market logic, restricted investors also consider a community logic.

The study is organized as follows: Section 2 provides a literature review that encompasses the difference between the types of crowdfunding, as well as socially responsible investing. We elaborate the research hypotheses in Section 3, which is grounded in institutional logic. To this extent, we first differentiate equity crowdfunding from other types of crowdfunding, and then rely on signaling and identity mechanisms to differentiate the orientation toward sustainability between restricted and professional investors. Section 4 presents the data, variables, and methodology used

in the study. In Section 5, we report the results, and the implications are then discussed in Section 6. Section 7 concludes this study.

2. LITERATURE REVIEW

The motivation of this study on the sustainability in equity crowdfunding is that sustainability-oriented entrepreneurs find it difficult to match investors' preferences. The task to communicate to providers of finance the prospects of a sustainable-oriented firm is indeed not trivial. This is particularly relevant if we consider the heterogeneous nature of the concept of sustainability, which include the creation of new products or services that are a more sustainable alternative to traditional offerings in the marketplace (e.g. hemp clothing, which is more sustainable to grow and harvest, and is also durable and odor-resistant, which requires less laundering) as well as the delivery of products or services that themselves seek to address a social or environmental issue (e.g. the creation of large floating rings that can collect ocean plastic).

In this regard, crowdfunding may overcome some of the difficulties in communicating with conventional financiers. Importantly, as explained in the introduction, equity crowdfunding attract an unprecedented diversity of investors. Accredited investors, with millions of dollars under management, bid together with small investors. The set of motivations to invest in equity crowdfunding is consistently heterogeneous. Some investors are short-term oriented, while some others are interested in contributing to a sustainable world while simultaneously delivering competitive rates of returns. The latter relates to growing interest in socially responsible investing.

Socially responsible investing integrates personal values and societal concerns into investment decision-making (Schueth, 2003). The distinctive trait of this community of investors lies in their investment selection process, which embraces criteria other than solely the monetary

return on investment. Their portfolios for instance include companies with sound environmental practices, or companies that express respect for human rights worldwide. As such, socially responsible investing is an important catalyst to developing sustainable businesses. This is true for entrepreneurial finance in particular. Seed investors act as gatekeepers to the emergence of new businesses, because of their role in selecting venture ideas (Bocken et al., 2015). In turn, entrepreneurs are increasingly confronted with investors' demand for companies to meet a triple-bottom line of economic, environmental, and social value creation (Elkington, 1997). Despite the interplay between sustainability and finance, sustainability research in entrepreneurial finance is still emerging.

Only few studies have investigated the sustainability orientation and effects of traditional providers in seed financing, such as venture capitalists (VCs) and business angels. Among these studies, Bürer and Wüstenhagen (2009) investigated policy preferences of cleantech VCs. They used qualitative interview data to identify which policies are perceived to be more effective at stimulating investment interest in innovative clean energy technology companies. Cumming et al. (2016) find consistent evidence of a pronounced role for oil prices in driving cleantech venture capital deals, which is more important than other economic, legal or institutional variables. Cumming et al. (2017) provided an empirical analysis of crowdfunding in the cleantech or alternative energy sector. They examined over 20,000 different projects on the reward-based platform Indiegogo, and found that cleantech entrepreneurs who use soft mechanisms to mitigate information problems are more likely to have a successful fundraising campaign.

Some recent studies have investigated how sustainability-oriented or green ventures perform in crowdfunding. Calic and Mosakowski (2016) found that a sustainability orientation increases funding success in technology and film/video projects on the leading reward-based

crowdfunding platform Kickstarter. The direct effect of a sustainability orientation on funding success is partially mediated by the creativity of crowdfunding projects, but the mediating effect for project legitimacy is only found in the technology sample. Other studies have investigated the environmental orientation of crowdfunding campaigns, with mixed results. Using a sample of 585 campaigns in Indiegogo, Horish (2015) found no connection between environmental orientation and crowdfunding success. Bonzanini et al. (2015) claim instead that crowdfunding is an interesting source of capital for green initiatives, as it combines the opportunity to generate a profit with the desire to contribute to climate action initiatives.

Equity-based crowdfunding is intrinsically different from donation- and reward-based crowdfunding, upon which the above-mentioned studies are performed.

First, types of crowdfunding differ in the funders' primary motivation for participating. While the motivation to donate may be philanthropic, a marked characteristic of equity crowdfunding is the possibility of financial returns. Research on donation-based crowdfunding communities draws from the extensive literature on charitable giving and public goods, examining principles that are unlikely to apply to investors in financial markets such as equity crowdfunding. In reward-based crowdfunding, backers evaluate a proponent's ability to deliver the pre-purchased product. Backers may be offered "ego-boosting" symbolic rewards such as a name plaque or "community-belonging" rewards such as invitations to social events (e.g. the launch party of the project). These experiential rewards often have intrinsic, but non-tradable value. Even when the reward has economic value, the decision to bid might be substantially different from those of investors in equity crowdfunding. Indeed, in a multi-platform study of equity crowdfunding campaigns, Vismara (2016) found that offering rewards to investors does not increase the probability of success.

Second, the problems of information asymmetry and moral hazard are higher in equity crowdfunding than in other types of crowdfunding. In equity crowdfunding, the information asymmetry concerning the start-up's ability to generate future cash flows influences the crowdfunder's decision to become a shareholder. As equity crowdfunders consider becoming a minority shareholder, governance concerns arise from the separation between ownership and control. Like in other financial markets, the related agency costs impact equity crowdfunding. These considerations do not apply to reward-based crowdfunding, where backers expect to receive a reward and are not necessarily interested in the long-term potential of the company.

Third, equity crowdfunding also differs from other types of crowdfunding in the nature of its proponents and in the size of the deals. The average size of campaigns in United Kingdom platforms Crowdcube and Seedrs is about 250 thousand pounds (Vismara, 2016) and the campaign is, by definition, launched by a company. The proponents in reward-based campaigns are launched mostly by individuals. In Kickstarter, the average target is less than \$15,000 (e.g. Kim and Viswanathan, 2014). The size of investment is likely to affect the investment decision. For smaller investments, like those in reward-based crowdfunding, the fraction of investors with more sustainability concerns are expected to be larger, due to lower risk aversion.

To sum up, since sustainable entrepreneurship has traditionally found narrow financing opportunities, crowdfunding is expected to increase such opportunities. These expectations rely on the assumption that the motivations of crowdfunding participants are different from those of traditional financial investors. However, crowdfunding is a multifaceted industry with many different types. In this paper, we focus on equity crowdfunding, thereby taking the perspective of equity investors, central to entrepreneurial finance.

3. THEORY AND HYPOTHESES

“For the first time,” proclaimed President Obama when he signed the JOBS Act, “ordinary Americans will be able to go online and invest in entrepreneurs that they believe in.”¹ This statement highlights how a premise of crowdfunding is that investors would rely, at least in part, on the collective “wisdom of the crowd” to make better informed investment decisions. In equity crowdfunding, professional investors coexist with restricted investors.² While the latter are what we generally refer to when thinking about crowdfunding, the former are an equally important constituent. Angel investors are frequently found to operate in all United Kingdom equity crowdfunding platforms (Enterprise Research Centre, 2014). Nesta (2014) reports that institutional investors embracing alternative finance is becoming a feature of the United Kingdom market. In some platforms, such as SyndicateRoom or AngelList, professional investors – such as VCs or business angels– are mandatorily required to invest in each offering. In the case of Crowdcube, they are responsible for a large part of the investments. Indeed, although most of the “crowd” is made of restricted investors, professional investors tend to invest substantial amounts of money. For instance, the crowdfunding offering of Sugru, creator of the world’s first moldable glue, received one million pounds in a single investment.

Restricted investors (i.e., the “crowd”) presumably bear high information-processing costs. They are reported to lack the experience and the capability to evaluate different investment opportunities (Ahlers et al., 2015). Additionally, they might not have the incentive to devote substantial resources to the due diligence process, because they have invested meager amounts,

¹ This quotation is from the White House Press Release, accessed at <https://www.whitehouse.gov/the-press-office/2012/04/05/remarks-president-jobs-act-bill-signing>. The Jumpstart Our Business Startups (JOBS) Act authorizes equity crowdfunding. In October 2015, the Securities and Exchange Commission (SEC) adopted final rules, set to become effective 180 days after publication in the Federal Register.

² Corporate finance literature defines small investors as those who (1) invest relatively small amounts of money, and (2) receive a relatively small stake of a company in return. This definition is in line with that of restricted investors used in crowdfunding (see next Section).

making due diligence economically inefficient. This is not the case for professional investors, who are more likely to possess more accurate information that allows them to select high-quality offerings.

There are therefore reasons to expect different behavior from restricted and professional investors with reference to sustainability. Recently, management studies are focusing on how different receivers treat the same signal (Bergh et al., 2014; Connelly et al., 2011). Whether investors - and which type of investors - care about sustainability when considering bidding in equity crowdfunding can be studied through these lenses. The effectiveness of an attribute, or the effects of a signal, depends not only on the sender of the signal, but also on the characteristics of the receiver. For instance, the signaling process will not work if the receiver is not looking for the signal or does not know what to look for. Moreover, some receivers interpret signals differently than others (Perkins and Hendry, 2005; Srivastava, 2001).

Different audiences have different norms, beliefs, rules, and procedures for assessing a venture. As synthesized by Suchman (1995), assessments are audience dependent. Identity mechanisms apply when a venture aligns with an audience's values and beliefs. We use the theoretical lenses provided by institutional logic to identify the differences between restricted and professional investors. The term institutional logic was introduced by Alford and Friedland (1991), who identified in capitalism, state bureaucracy, and political democracy three competing institutional logics that shape individuals' actions. The individual behavior, therefore, must be investigated in an institutional context, which influences the way a particular social world works (Jackall, 1988). By this approach, a market is not only an allocative mechanism, but also an institutionally specific cultural system, where participation is not only an expression of what one wants, but also of who one is (Friedland and Alford, 1991). Consequently, the formation of

individual preferences is not purely rational and independent from that of others. As preferences are socially constructed, collective identities emerge out of social interactions and communications between members of a social group (White, 1992).

3.1 The market logic of professional investors

A recent study by Fisher et al. (2017) hypothesized that the investment decisions of different types of investors are dominated by different logics. For instance, grant administrators of governmental agencies adhere to state logic, while managers of corporate VC funds adhere to corporate logic. These arguments can be applied to sustainability in crowdfunding, by differentiating sensibility to the topic between professional and restricted investors.

There is no doubt that professional investors invest in crowdfunding, like in anything else, to realize a monetary return. Their role is to select promising startups with the goal of generating high economic returns (Cumming, 2008), and their financial and professional wealth depends on their investment decisions. With such goals, self-interest is likely to determine the investment process (Thornton et al., 2012). Community level considerations are often not of primary importance to professional investors, if we consider that it has happened that local communities object to VCs' request to relocate promising companies, or to outsource jobs to other locations.

In line with these arguments, previous literature has identified that personal capitalism is the dominant economic paradigm of professional investors such as VCs and business angels (Pahnke et al., 2015). As capital is committed to generate market returns through the private appropriation of value, it is the market logic that dominates the context in which professional investors decide. Therefore, professional investors will make their decisions based on expected rates of returns. Considering their short investment horizons, they strive for short-term returns (Shane, 2012). Moreover, the high-risk profile of their investments induces professional investors

to only look for ventures with high scalability and a disruptive potential. Sustainability is arguably neither short-term nor high-growth oriented.

Under such market logic, investors' identity stems from their reputation in the market, which is gained and sustained through their investment track record. Most professional investors have extensive and successful business experience. Beside monetary returns, other motivations for professional investors – if there are – involve psychological traits, such as the desire to succeed, social status, and adventure (Van Osnabrugge and Robinson, 2000). Considering the importance of achieving confidence in partner co-operation within the investor-entrepreneur relationship (Shephard and Zacharakis, 2001), this reflects in the human capital and the personality traits of the entrepreneurs that they seek. In terms of expertise, professional investors look for venture leaders that can bridge the technological and market domains, and who are able to identify customers' demand to create a market (Powell and Sandholtz, 2012) and rapid business growth (Muzyka et al., 1996). These short-term investment horizons are at odds with sustainability. We therefore expect sustainability orientation to not be attractive for professional investors. Based on these observations, we present hypothesis 1:

Hypothesis 1: Equity crowdfunding campaigns with a sustainability orientation are less likely to attract professional investors.

3.2 The community logic of restricted investors

Restricted investors receive a relatively small stake in a company in return for their investment. As reported by Vismara (2017), the average equity stake offered in Crowdcube is 13.8%, whereas the average number of restricted investors in successful campaigns is 152.5. The

average restricted investor, therefore, acquires less than 0.1% of the company's equity. This small share of ownership clearly does not entitle restricted investors to effectively control rights over the companies (Cumming et al., 2018). Moreover, as better described in the next section, crowdfunding investments by restricted investors cannot exceed 10% of their net assets overall. Their investment decisions are therefore different from those of pure financial investors interested in the market for corporate control and financial gain.

We argue, in institutional logic terms, that the economic standpoint of restricted investors is ascribed to cooperative capitalism. Although every investor pays attention to financial metrics, not all criteria receive the same attention. In the perspective of restricted investors, the interest in crowdfunding is likely to be blended with non-market values, so to include goals beyond pure financial returns. This is related to their motivations, but also to the funding mechanisms. Cumming et al. (2018), for instance, find that the provision of voting rights attract accredited investors in equity crowdfunding offerings. On the contrary, the implementation of a threshold for the attribution of voting rights does not impact the demand of shares by restricted investors.

For the reasons above, we argue that restricted investors adhere more to a community logic, which involves cooperative capitalism as the pervasive lens, a commitment to community values, and belief in trust and reciprocity (Thornton and Ocasio 1999, 2008). Recent crowdfunding research highlights the importance of entrepreneurs' social engagement within the crowdfunding community as a key aspect for success on a crowdfunding platform (Vismara, 2016). Coherently, entrepreneurs and investors often stay connected through a sense of group membership (Block et al., 2018). This communitarian predisposition is likely associated with a sustainability orientation.

These considerations lead to our second hypothesis:

Hypothesis 2: Equity crowdfunding campaigns with a sustainability orientation are more likely to attract a higher number of restricted investors.

4. RESEARCH DESIGN

4.1 Equity crowdfunding in the United Kingdom

Being the largest market for equity crowdfunding, the United Kingdom provides the best opportunity to investigate how crowdfunding investors consider the sustainability orientation of ventures. The two largest equity crowdfunding platforms in the United Kingdom are Crowdcube and Seedrs. Established in 2011, Crowdcube is, as of February 2017, the world's largest platform, with £340 million successfully raised from 430,000 investors from over 100 countries. Each project's business plan is vetted before listing (according to Crowdcube statistics, the due diligence team, on average, verifies 28 entrepreneur claims for each admitted project), which means that no ongoing reporting is required for the company. Established in 2012, Seedrs is the main competing platform for equity crowdfunding in the United Kingdom. Both platforms work in an "all-or-nothing" fashion, which means that if the target amount is reached, the campaign is successful, and investors become direct shareholders in the company. If the target is not reached, the money is given back at no monetary cost for bidders.

4.2 Regulatory framework and types of investors

The regulation of equity crowdfunding is currently defined in the United Kingdom by Policy Statement PS14/4 of the Financial Conduct Authority (FCA). This statement delegates to the FCA the task of "mitigating the liquidity risk investors face when investing in the equity or debt securities of small and medium enterprises, which are difficult to price and for which there is no –

or only a limited – secondary market”. Both professional and restricted investors may trade on crowdfunding platforms. Professional investors include high net-worth investors and certified sophisticated investors. High net-worth investors are defined under pre-existing rules as those with an annual income of at least £100,000, or net assets of at least £250,000. Certified sophisticated investors are defined as such if a qualified company assesses the investor’s capability to understand the risks associated with engaging in non-readily realizable investments. Additionally, they can be defined as such if they have a “Self-Certified Professional Investor” statement, in which the investor declares to be a member of a network of business angels, to have worked in the business finance sector over the previous two years, or to have served as a director of a company with at least £1 million in revenues.³ Professional investors (i.e. both high net-worth and certified sophisticated investors) are not subject to any specific restriction when investing in crowdfunding. The list of professional investors that invested in Crowdcube campaigns includes the British Business Bank, Octopus Investments, and the United Kingdom government’s London Co-Investment Fund.

If (and only if) an investor is neither high net-worth nor sophisticated, he is a restricted investor, in accordance with Code of Business Sourcebook (COBS). Chapter 4.7.10. For restricted investors, the portion of money invested in non-readily realizable investments, including crowdfunded securities, cannot exceed 10% of his or her net assets. Restricted investors are required to certify that they understand investment opportunities and risks, or that they have received independent advice. Furthermore, COBS 4.7.7 restricts direct offer financial promotions to restricted investor clients, while they can be freely communicated to any professional client.

4.3 Sample

³ The definition of the types of investors in equity crowdfunding in the UK is available on crowdfunding websites. For instance, in Crowdcube is available here: www.crowdcube.com/pg/investor-categories-1554.

The sample comprises of the full population of 345 initial equity offerings listed on Crowdcube and Seedrs in the period from January 2014 to December 2015. We exclude mini-bond offerings, offerings of convertibles bonds, and equity offerings by companies that have previously raised capital through equity crowdfunding. Data from Seedrs were provided by the data scientist of the platform, while data from Crowdcube were automatically collected daily using a web crawling algorithm.

To identify sustainability-oriented equity offerings, we performed a text analysis by searching for the following words in the project description: Sustainability, Sustainable, Ecological, Eco-innovation, Eco-efficient, Eco-effective, Eco-design, Ecology (Adams et al., 2016; Pujari et al., 2003), Environmental, Green, Renewable, Dematerialization (Maxwell and Van De Vorst, 2003), Cradle to cradle (McDonough and Braungart, 2002), Backcasting (Natrass and Altomare, 1999), Biomimicry (Benyus, 1997), Jugaad innovation (Radjou et al., 2012), Circular economy, and Closed-loop production (Abdallah et al. 2011). This method yielded a sample of 124 campaigns. This selection of course included campaigns that are not sustainability-oriented, since the keywords used to identify sustainability have alternative meanings (e.g. “Green”). Therefore, this initial selection was scrutinized by using traditional human coding. Two coders were recruited from the undergraduate program at the author’s university. The coders did not communicate with each other, and the author met with each to explain the constructs and to answer any questions. They were asked to read the “idea” and the “market” sections⁴ of the 124 campaigns to identify the sustainable-oriented. To identify a company’s sustainability orientation, they were referred to Shepherd and Patzelt’s (2011, p. 137) definition of ventures that “focus on the preservation of nature, life support, and community in the pursuit of perceived opportunities

⁴ The “idea” section of the average equity offering is 893 words long, while the “market” section counts on average 876 words.

to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society”.

The analyses by the two coders lead to the identification of 59 ventures as sustainability-oriented.

Examples of sustainability-oriented companies in the sample are; “The Cheeky Panda 100%”, who commercializes ultra-sustainable, low-carbon, bamboo tissue products; “Sustainable Accelerator”, whose mission it is to empower the next generation of businesses redefining the way we consume energy, manage waste, clean air, and apply smart resource technology; “Mishergas Energy Recovery”, which declares to develop sustainable answers to environmental hazards whilst creating profitable business models; “Fishy Filaments”, which aims to make the United Kingdom fishing industry more sustainable by transforming used fishing nets into 3D printer filament; and “Mercato Metropolitan”, which is a sustainable and inclusive food hub with the allure of a farmers’ market. More detailed examples of sustainability-oriented campaigns are provided in the Appendix.

4.4 Variables

The analyses are performed with reference to two types of outcome variables. First, we define a count variable *No_Investors* as the number of investors at the end of the campaigns (Vismara, 2016). Second, we define *Professional_Investors* a dummy variable equal to 1 if a professional investor (i.e. a high net-worth or a certified sophisticated investor) has participated in the campaign. The distinction between professional and restricted investors is done by the platforms, according to COBS Chapter 3 (Client categorization). Third, as a robustness check, we run a regression with the *Success* dummy as dependent variable.

Table 1 provides the list and the definitions of independent variables, which are defined in line with previous studies on equity crowdfunding (e.g. Ahlers et al., 2015; Vismara, 2017).

Regarding structure of the offer, the target amount of capital to be raised (*Target_Capital*) and the relative percentage of equity offered to investors (*Equity_Offered*) in each offering are measured as by Ahlers et al. (2015). We use the number of board members to broadly capture the amount of human capital. This is measured as the size of the top management team (*TMT_Size*) by counting the number of team members in entrepreneurial ventures as reported on the “Team” page of each project. As defined by Cumming et al. (2018), *Founder_Experience* is measured by the founder’s number of previous projects. Signori and Vismara (2017) find that one third of the companies that successfully raised capital in Crowdcube raised further capital in seasoned equity offerings. We identify seasoned campaigns with a dummy variable *Serial*. Projects can qualify for tax incentives according to the United Kingdom Seed Enterprise Investment Scheme SEIS, which is designed to encourage seed investment in early-stage companies with up to £150,000 capital raised (*Tax_Incentives*). Finally, we control for industry starting from Crowdcube classification. We control for the platform by including the *Seedrs* dummy. Time dummies, that identify the month in which the offering is listed on the platform, are also included in the regressions.

Insert Table 1 Here

4.5 Descriptive statistics

Table 2 reports the descriptive statistics of the samples in this study. Approximately 50% of the offerings in the sample successfully reach their target. This percentage is higher than in previous studies on United Kingdom equity crowdfunding based only on the Crowdcube platform. Vismara (2017), for instance, found a success fraction of 41%. The evidence of the present study is due to the larger proportion of successful offerings in Seedrs. The average offering in the sample

raised capital from 83 investors. This number is in line with previous studies in United Kingdom equity crowdfunding, but higher than the average reported by Ahlers et al. (2015) for the Australian crowdfunding ASSOBS (7 investors). The fraction of offerings that include professional investors is 19%, which is slightly higher than found by Signori and Vismara (2017). Again, this is due to the inclusion of offerings in Seedrs in the present study.

As mentioned in the Sample section, 59 out of 345 campaigns are sustainability-oriented (17%). About one third of the sample offerings are listed in Seedrs (116 out of 345). The number of TMT members (*TMT_Size*) ranges from 1 to 15, with an average of 4.5, which is larger than the 3.6 figure reported for ASSOBS projects (Ahlers et al. 2015). The average equity offered at listing is 12.55%, and the average target capital is £251,030. These figures are similar to those reported in previous studies on equity crowdfunding platforms in the United Kingdom (Vismara, 2016; Vismara, 2017). Considering the high average number of investors, we can see that equity crowdfunding in the United Kingdom is more truly characterized by the presence of small investors, relative to other platforms more similar to networks of BAs. The average investment in the sample of this study is about £3,000 (£251,030 from 83 investors). Finally, 41% of the offerings in the sample are eligible for tax incentives under SEIS.

With a univariate analysis, we explore whether and how sustainability-oriented projects differ from the rest of the sample in terms of the described attributes. We find that sustainability-oriented companies are launched by founders with higher experience ($p < 0.05$). In terms of outcome, we find no difference between sustainability-oriented and non-sustainability oriented projects regarding the probability of success. However, sustainability-oriented companies attract, on average, a larger number of investors ($p < 0.10$), while non-sustainability oriented campaigns are preferred by professional investors ($p < 0.10$).

Insert Table 2 Here

4.6 Methodology

Although the univariate analysis did not show substantial differences in the characteristics of sustainability-oriented and non-sustainability oriented campaigns, we use a propensity score matching to ensure balance in baseline characteristics between the two types. Because of the small number of sustainability-oriented campaigns, the commonly used “nearest-neighbor matching” poses the risk of bad matches (Bonardo et al., 2011). Therefore, we adopt a radius approach, which imposes a tolerance level on the maximum propensity score distance (caliper). Larger differences will not result in matches, while all units whose differences lie within the caliper’s radius will be chosen. As in Cumming et al. (2015), we match projects based on goal, category, and campaign start date. Thereby, the sample is reduced from the original 345 campaigns to 294. This sample is used in the subsequent econometric analysis.

There are two outcome variables. To test Hypothesis 1, we run a negative binomial regression on the number of investors at the end of the campaign. To test Hypothesis 2, we run a probit regression on the binary variable identifying the presence of professional investors. Both these dependent variables are measured after the definition of the text of the online campaigns, on which the sustainability orientation is assessed. However, the temporal condition is not enough to determine causality, which requires that no other causes should eliminate the relation between the variables. We address this issue by conducting a Durbin-Wu-Hausman endogeneity test, using a mimicking variable as the instrumental variable. A good instrumental variable should be highly correlated with the potentially endogenous variable (sustainability orientation, in this context) but

not directly correlated with the dependent variable (number of investors and presence of professional investors). Mimicking variables are defined as the reference variable (i.e. sustainability) and measured for each company as the average of all equity offerings in the same industry in the previous year. Mimicking is a common behavior to achieve legitimacy (Deepphouse and Carter, 2005), and is used in finance studies in initial public offerings (Bertoni et al., 2014) as well as crowdfunding (Cumming et al., 2018). Mimicking variables are, by definition, fully exogenous. In this case, the mimicking variable of sustainability orientation is also likely to be excludable, given that investment decisions in an offering are unlikely, based on the sustainability orientation of previous campaigns. Therefore, the frequency of sustainability-oriented campaigns preceding each campaign is a suitable instrumental variable in this study. The Durbin-Wu-Hausman test (Hausman, 1978) failed to refute the null hypothesis, indicating that endogeneity should not be a concern in this study.

A correlation matrix among all the independent variables is shown in the Table 3. The variance inflation factors (VIFs) associated with each model specification all fall well below the acceptable threshold of 10, indicating multicollinearity is not a concern.

Insert Table 3 Here

5. RESULTS

In Table 4, we report the results from the regressions. In Model 1, the dependent variable is the *Success* dummy; in Model 2, the dependent variable is the number of investors at the end of the campaign (*No_Investors*); and in Model 3, the dependent variable is a dummy that identified the

presence of professional investors (*Professional_Investors*). While the coefficient on *Sustainability_Oriented* in Model 1 is not significant, it is positive and significant ($p < 0.05$) in Model 2, thus providing support for Hypothesis 2. Therefore, we do not find evidence of a positive link between sustainability association and the success of equity offerings. However, sustainability-oriented campaigns do attract a higher number of investors. An explanation for these contrasting results comes from Model 3, where results show that the *Sustainability_Oriented* is not a determinant of the presence of professional investors. Therefore, although sustainability attracts a higher number of small investors, it does not increase the chances of success of the campaign. Thereby, Hypothesis 1 is not supported.

Concerning control variables, the results of this study are mostly in line with evidence provided by Ahlers et al. (2015) and Vismara (2016). The number of TMT members (*TMT_Size*) is positively related to the outcome of the campaigns in terms of probability of success ($p < 0.05$) and number of investors ($p < 0.01$). This suggests that the size of the management team is perceived by outside investors as an indication of the company's ability to cope with the uncertainty of the market. According to survey participants in Nesta (2014), when selecting investments, the number of TMT members is a more important consideration than the characteristics of the project itself. Larger campaigns are associated with a higher number of investors ($p < 0.01$) and with the presence of professional investors ($p < 0.01$). This can be intuitively explained by the need of more investors and big investors to achieve higher targets. It seems like the target size has no significant impact on the probability of success.

In line with previous studies (e.g. Vismara, 2016), the coefficient of *Equity_Offered* is negative and significant in all models. As modelled by Leland and Pyle (1977), entrepreneurs who are optimistic about a venture's potential retain as much equity as possible. Those who are not as

confident that the company can generate positive cash flow in the future, tend to raise money by selling large portions of equity to investors. Similar to studies on initial public offerings (IPOs), a large proportion of equity offered to outside investors in crowdfunding is considered a negative signal. Tax incentives do not impact the probability of success of the offerings, but they do attract professional investors. The coefficient of *Tax_Incentives* is negative and significant only in Model 2 ($p < 0.05$). Finally, the dummy variable *Seedrs* is positive and significant in predicting a higher chance of success ($p < 0.01$, in Model 1), and the presence of professional investors ($p < 0.01$, in Model 3).

Insert Table 4 Here

6. DISCUSSION

The introduction through equity crowdfunding of investors without prior experience, and who are likely to have different decision-making patterns than professional investors, permits researchers to study funding decisions in greater detail (Cumming and Johan, 2013). In this paper, crowdfunding investment decisions are considered in relation to sustainability, thereby combining two themes of great relevance. Existing studies on sustainability in crowdfunding are typically based on reward-based crowdfunding. Equity crowdfunding differs from other types of crowdfunding in several ways. First, the motivation to invest and become a shareholder of a company is likely to be different from that of becoming a customer. While there are several motivations that may move backers to bid for a reward, monetary return is one of the main motivations for investors in equity securities. The time-horizon and the size of the investment are

also higher for equity investors. To them, information asymmetries and moral hazard concerns matter in order to realize an exit from the investment, which typically requires an IPO or an M&A.

The parallelism with traditional primary equity markets, such as IPOs, provides further motivations of interest in the study. In IPOs, institutional investors are being allocated the largest fraction of the shares (Aggarwal et al., 2002). Moreover, over the last two decades, three quarters of the IPOs took place in secondary markets such as London's Alternative Investment Market (AIM). Most of these IPOs were offered exclusively to institutional investors (Vismara et al., 2012). Comparatively, equity crowdfunding appears to be a highly distinctive, relational form of entrepreneurial finance, filling an important funding gap for certain ventures, but also providing investment opportunities to a diverse set of investors (Cosh et al., 2009).

The transparency of the crowdfunding market, along with the concurrent participation of professional and restricted investors, offers the opportunity of a detailed analysis of investment decisions. It is well understood that information cues associated with an investment opportunity generally impact one's willingness to participate, but less is known about the preferences of different types of investors. This study shows that restricted investors, absent in other entrepreneurial finance markets, value the sustainability-orientation of companies. Entrepreneurs find in crowdfunding an audience in agreement with their sustainability orientation, while investors find in crowdfunding opportunities to invest their money in line with their values. This is an important contribution to the inclusivity and democratization of financial markets in terms of both supply and demand of capital.

Sustainability is found to be differentially appreciated by restricted and professional investors. Such distinction – which is a novel contribution to the understanding of the interplay between entrepreneurial finance and sustainability – is interpreted considering institutional logic.

Specifically, we argue that investment decisions are taken by professional investors with a market logic, in which expected high monetary returns are the main logic for support. Their economic perspective is therefore that of personal capitalism. Conversely, cooperative capitalism better describes the economic perspective of restricted investors, which also consider a community logic. Their investment decisions are likely to consider projects' non-monetary aspects, such as the attention to community advancement and the potential of "bettering the world." This distinction between restricted and professional investors also has long-term implications. A recent study by Signori and Vismara (2017) found that none of the sample companies initially backed by professional investors subsequently failed. Therefore, although we find that sustainability orientation does not impact the chances of success of a crowdfunding campaign (as it attracts restricted investors), its chances of long-term success are an important topic for future research.

A theoretical argument of this study is that investment decisions regarding sustainability can be interpreted through the lens of institutional logic. Investors that are identified as more embedded in a community logic are more likely to appreciate the sustainability-orientation of new ventures. Our results are however based on the information disclosed in crowdfunding campaigns, meaning that we did not directly observe the behavior of the proponents. Accordingly, research on framing might be an interesting approach to further investigate sustainability in crowdfunding. Framing refers to changes in the presentation of a subject to produce changes in its assessment (Chong and Druckman, 2007). Discursive opportunity structures, for instance, refer to the opportunity provided by salient discourses that are alive and have momentum at a particular point in time (Cornelissen and Werner, 2014). These effects – which have been proven to significantly affect collective decision-making (Tversky and Kahneman, 1981) – could be relevant in crowdfunding, where a large number of restricted investors make decisions based mainly on the

presentation of campaigns, but with limited incentives to pursue due diligence or monitor and interact with the entrepreneurs.

7. CONCLUSIONS

This study fills a void in the literature by investigating how sustainability-oriented offerings perform in equity crowdfunding. We find that, although sustainability *per se* does not increase the chances of success of equity offerings, it does attract more restricted investors. This can be explained by looking at the nature of the audience. While professional investors, who do not invest more in sustainability-oriented projects, follow a market logic in which they value the private appropriation of value, small investors are more sensitive to a community logic.

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Table 1

Variables Definition

This table reports the descriptive statistics for the sample of 345 equity offerings.

Variable	Definition
Success	Dummy=1 if funding amount is greater than or equal to the target capital; 0 otherwise
No_Investors	Number of investors at the end of the campaign
Professional_Investors	Dummy=1 if at least one professional investor invested in the campaign; 0 otherwise
Sustainability_Oriented	Dummy=1 if the campaign is sustainable-oriented; 0 otherwise
Seedrs	Dummy=1 if the campaign is listed in Seedrs; 0 if in Crowdcube
TMT_Size	Number of the firm's TMT members
Founder_Experience	Number of founder's previous work experiences
Target_Capital	Target capital to be raised (in £1,000s)
Equity_Offered	Percentage of equity offered
Serial	Dummy=1 if the campaign is launched by a company that previously raised funds in equity crowdfunding; 0 otherwise
Tax_Incentives	Dummy=1 if the Seed Enterprise Investment Scheme (SEIS) tax relief is available for investors; 0 otherwise

Table 2

Univariate analysis

This table reports the descriptive statistics for the sample of 345 equity offerings. The tests compare sustainability-oriented and non sustainability-oriented firms. The significance levels are based on t-statistics (mean), the Mann-Whitney U-test (rank), or a Z-test of equal proportions as required. Statistical significance levels are at 1% (***), 5% (**), or 10% (*).

Variable	Sample		Sustainability-oriented		Non Sustainability-oriented	
	Mean	Median	Mean	Median	Mean	Median
Success	0.51	1	0.47	0	0.52	1
No_Investors (No.)	82.67	26	94.69*	39	80.19	21
Professional_Investors	0.19	0	0.12*	0	0.21	0
Sustainability_Oriented	0.17	0	1***	1***	0	0
Seedrs	0.34	0	0.31	0	0.34	0
TMT_Size (No.)	4.52	4	4.57	4	4.51	4
Founder_Experience	3.22	3	3.08**	3	3.54	4
Target_Capital (in £1,000s)	251.03	150.00	283.17	150.00	244.40	150.00
Equity_Offered (%)	12.55	10.30	11.36	10.00	12.79	10.68
Serial	0.18	0	0.22	0	0.17	0
Tax_Incentives	0.41	0	0.37*	0	0.42	0

Table 3

Correlation matrix

***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively for the difference from zero of the correlation coefficients. A star indicates a significance level at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Sustainability_oriented	1										
(2) Seedrs	-0.05	1									
(3) TMT_Size	0.03	0.16	1								
(4) Founder_Experience	-0.12	0.04	0.27*	1							
(5) Target capital	0.01	0.34*	0.24*	0.18	1						
(6) Equity offered	-0.06	-0.12	-0.10	-0.10	0.15	1					
(7) Serial	0.09	-0.11	0.35*	0.17	0.15	0.11	1				
(8) Tax_Incentives	-0.11	-0.37*	-0.13*	0.09	-0.42*	0.07	-0.03	1			
(9) No_Investors	0.03	0.27*	0.27*	0.09	0.63*	0.13	-0.22	-0.26*	1		
(10) Success	-0.07	-0.12	-0.05	0.08	-0.05	0.09	0.12	0.12	-0.07	1	
(11) Professional_Investor	-0.08	0.21*	0.25*	0.11	0.21	0.14	-0.17	-0.17	0.17	-0.09	1

Table 4

Determinants of the Success of a Campaign

This table reports the results of regressions using a sample of 294 equity crowdfunding offerings listed on Crowdcube and Seedrs in 2015 and 2016. The dependent variable in Model 1 is the success dummy; in Model 2, the number of investors at the end of the campaign; in Model 3, the dummy variable identifying the presence of professional investors. The variable definitions are in Table 1. Each regression controls for industry and time effects. Robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Sustainability_Oriented	0.070 (0.135)	2.462** (1.141)	-0.175 (0.155)
Seedrs	0.485*** (0.020)	0.140 (0.353)	0.548*** (0.204)
TMT_Size	0.175** (0.070)	0.153*** (0.018)	-0.060 (0.188)
Founder_Experience	0.026 (0.053)	0.026 (0.053)	0.198* (0.103)
Ln(Target_Capital)	0.009 (0.313)	0.258*** (0.025)	0.320*** (0.125)
Equity_Offered	-0.175** (0.071)	-0.185*** (0.010)	-0.415** (0.211)
Serial	0.451 (0.422)	0.419 (0.423)	0.080* (0.043)
Tax_Incentives	0.284 (0.452)	0.038 (0.145)	-0.518** (0.242)
Constant	0.135 (0.205)	-1.487*** (0.220)	-0.414 (0.462)
Pseudo R ²	0.141	0.103	0.112

Appendix.

Excerpts from sustainability-oriented campaigns.

Company	The Cheeky Panda	Mishergas Energy Recovery	Sustainable Accelerator empowers	Fishy Filaments
Website	thecheekypanda.co.uk	mishergas.co.uk	sustainableaccelerator.co.uk	fishyfilaments.com
One-line description	100% Ultra Sustainable, Low Carbon, Bamboo Tissue Products	Waste is only unrealised potential	The UK's best SEIS & EIS sustainability startups	With the aim to make the UK fishery more sustainable
First sentence of the campaign's webpage	We believe companies and consumers want high quality but sustainable green products at affordable prices	We strive to develop sustainable answers to environmental hazards whilst creating profitable business models	Sustainable Accelerator, led by the Sustainable Ventures management team, supports the UK's best SEIS & EIS sustainability startups	Based in Cornwall, Fishy Filaments aims to help make UK fishery more sustainable through better waste management and more efficient net recycling
Mission	To inspire other entrepreneurs it's possible to create profitable businesses around sustainable, low carbon, high quality, affordable green products	To develop sustainable answers to environmental hazards whilst creating profitable business models	To empower the next generation of businesses redefining the way we consume energy, manage waste, clean air, and apply smart resource technology	To make the UK fishery more sustainable, by transforming used fishing nets into 3D printer filament
Product or service	We have created a range of Bamboo Tissue Products that are, high quality, sustainable and low carbon [...] as a solution to people looking for organic, natural and sustainable alternatives for every day products	We aim to transform the liability of waste tyres into saleable commodities, using a specially formulated process that is designed to clean up this potential threat in an environmentally responsible way	[We] developed a successful portfolio of sustainability businesses, championing innovative solutions and attracting significant later stage funding	[We] take used fishing nets and transforms them into 3D printer filament. The raw materials can normally be acquired at zero cost where fishers currently have to dispose of the nets
Target market	Almost everyone uses this product every day, the demand for tissue is increasing globally and we believe there is a lack of eco alternatives in the market [...] We have targeted eco conscious marketplaces in the UK to get a bridgehead for our products. This community is quite vocal and proactive in supporting innovation	In the UK alone, there are around 50 million tyres that are discarded, every year. These are a huge potential hazard to both the environment and human health [...] Our target market for achieving financial close will be from renewable funds, hedge funds and financial institutions with a green ethos	The Sustainable Accelerator Fund will invest into around 10 high potential sustainability businesses [...] leverage grant and tax advantages for the sustainability sector [...] governmental body London Waste and Recycling Board (LWARB) is investing £300k alongside the crowd into the Sustainable Accelerator Fund	When not recycled, fishers can pay £350/t or more to have old nets buried in landfill [...] We intend to support product sales with an ISO14044 compliant Life Cycle Assessment to ease use within carbon accounting systems, allow offsetting and/or for CSR reporting