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INVESTMENT CROWDFUNDING HAS LITTLE FAITH IN SUSTAINABILITY! AT LEAST FOR THE MOMENT

Carmen Mendoza^a

Isabel Parra^b

Álvaro Rezola^c

Nuria Suárez^d

Abstract:

We analyze the influence of sustainability on the probability of achieving successful investment crowdfunding offerings. We use a sample of 1,741 investment crowdfunding offerings launched by 1,569 firms in the US during the period May 2016-September 2019 under the Form-C requirements of the JOBS Act. After accounting for potential endogeneity concerns affecting the degree of sustainability of each offering, results show that sustainability-related factors do not boost the chances of successful investment crowdfunding offerings. This result is not homogeneous across firms, operations, or financial environments. We obtain evidence on the influence of firm characteristics and on how offering affects the extent to which sustainability impacts success. Moreover, alternative funding sources and the market structure for funding portals also shape the influence of sustainability on offering success. Results are robust to considering both firm- and offering-level factors traditionally linked with success, as well as to different specifications of the econometric model, and to additional robustness tests.

Keywords: investment crowdfunding; sustainability; success; firm, offering and market characteristics.

JEL Codes: G32; D26; D53

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^a C. Mendoza. Universidad Autónoma de Madrid. Department of Finance and Marketing. Francisco Tomás y Valiente, 5. 28049. Madrid. E-mail: carmen.mendoza@uam.es. Phone: +34 914 97 76 80. ORCID: <https://orcid.org/0000-0002-3180-2722>

^b I. Parra. Universidad Autónoma de Madrid. Department of Finance and Marketing. Francisco Tomás y Valiente, 5. 28049. Madrid. E-mail: isabel.parra@uam.es. Phone: +34 914 97 35 41. ORCID: <https://orcid.org/0000-0003-4980-6999>

^c Á. Rezola. Collisio Technologies and Universidad Autónoma de Madrid. Department of Finance and Marketing. School of Economics and Business. Francisco Tomás y Valiente, 5. 28049. Madrid. E-mail: alvarearezola@collis.io. ORCID: <https://orcid.org/0000-0003-4868-3093>

^d N. Suárez. Universidad Autónoma de Madrid. Department of Finance and Marketing. Francisco Tomás y Valiente, 5. 28049. Madrid. E-mail: nuria.suarez@uam.es. Phone: +34 914 97 57 44. ORCID: <https://orcid.org/0000-0003-0832-9778>

1. INTRODUCTION

When addressing global environmental and social problems, it is crucial for society, business, and governments to join forces in order to achieve sustainable future development. In response to this situation, the United Nations approved the Sustainable Development Goals at its 2015 Assembly - set within the 2030 Agenda (United Nations, 2020). As a result of the COVID-19 pandemic, this initiative has become even more important.

Entrepreneurs are one of the main drivers in the change towards sustainable development. For this reason, Shepherd and Patzelt (2011) defined sustainable entrepreneurs as those who are *“focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities 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”*. Likewise, sustainable entrepreneurship can be defined as *“all kinds of ventures that have a social or environmental mission as their primal goal, which aim to be financially and legally independent and strive to become self-sustainable by means of the market”* (Lehner, 2013). Sustainable entrepreneurship thus simultaneously links the economic, environmental, and social dimensions of sustainability. Whereas the environmental dimension attaches importance to aspects related to the biosphere, the conservation of nature and the development of the natural landscape, the social dimension looks at human living conditions, cultures, traditions, and the well-being of different groups (Pawłowski, 2008). The economic dimension focuses on the economic viability of projects (Laurell *et al.*, 2019).

However, given the risk involved in this kind of sustainable-oriented investments, entrepreneurs often have trouble in raising funds. Hence, crowdfunding is perceived as a new financing method that could close this funding gap for all types of entrepreneurial projects and, in particular, for those contributing to sustainable development (Lehner, 2013; Calic and Mosakowski, 2016; Hörisch and Tenner, 2020).

Crowdfunding is a method of financing that allows firms or individual entrepreneurs to raise funds for their ventures through relatively small contributions made by a large number of individuals via the internet. In addition, it does not require financial intermediaries, unlike capital or loan market activities (Mollick, 2014). Crowdfunding can be used as a source of funding in the start-up and early stages of a project, which in turn can be supplemented by public funds, business angels and bank loans (Mollick, 2014; Schwienbacher and Larralde, 2012). It is a method that can also be used by established companies to finance their expansion and growth opportunities (Lehner, 2013).

Three different types of crowdfunding can be identified. Firstly, donation-based crowdfunding, in which financial supporters do not receive any returns and contribute merely for the sake of supporting the campaign, with no expected (material) compensation. This form of crowdfunding is mainly used by non-profit and non-governmental organizations (Hörisch, 2015; Lehner, 2013). Secondly, in reward-based crowdfunding - a quite frequent type of crowdfunding (Böckel *et al.*, 2021)-, supporters receive material rewards on their investments (such as products or services). Thirdly, investment-based crowdfunding can be defined as a way to source money for a firm by asking a large number of backers (the crowd) to invest a relatively small amount. In this type of crowdfunding, investors will receive financial returns. In this category, a distinction can be drawn between equity-based crowdfunding and lending-based crowdfunding. In the case of equity-based crowdfunding, investors receive financial returns (a share of the profits) on their investment, as long as the venture proves profitable (Mochkabadi and Volkmann, 2020). For its part, lending-based crowdfunding is similar to a bank loan, in that supporters are lenders who receive a pre-defined interest rate.

Investment-based crowdfunding differs from donation and reward-based crowdfunding in several ways. First, funders' motivation to participate in crowdfunding campaigns is different. Whereas in donation-based crowdfunding the motivation may be philanthropic, in investment-

based crowdfunding the main motivation is the possibility of obtaining financial returns. In reward-based crowdfunding, backers may receive material rewards, such as products, and/or experiential rewards, such as invitations to social events. Although rewards may have a certain economic value, the investment motivation in reward-based crowdfunding and investment-based crowdfunding may differ. The popular perception is that investors support reward-based crowdfunding campaigns because they 'like' and 'enjoy' a project and want to back it, whereas investment-based crowdfunding campaigns attract people who are interested in backing projects for a return on their investment (Cholakova and Clarysse, 2015). In fact, Vismara (2016) confirmed that the probability of success of equity crowdfunding campaigns is not affected by the provision of rewards.

Second, the problems of information asymmetry and moral hazard are higher in investment crowdfunding than in other types of crowdfunding. Whereas in reward crowdfunding backers expect a delivery of goods or services that involve low marginal productivity costs (e.g., clothing, a piece of art or a handmade gadget), in investment crowdfunding investors have a claim on the venture's profit which requires significant entrepreneurial effort (e.g., attracting specialized talent, approved patents or closing partnerships) (Chod, et al. 2021). Therefore, in investment-based crowdfunding a greater degree of information asymmetries arises when assessing the ability of the start-up vis-à-vis to execute complex strategies and generate future cash flows, which influences the investor's decision to join the company as a shareholder or lender. Other concerns affecting investment-based crowdfunding are of the governance type and are related to the separation between ownership and control, as well as agency costs. In contrast, reward-based crowdfunding evidences no such difficulties, as backers only expect to receive their reward and need not be interested in the long-term operation of the company.

Third, as stated by Vismara (2019), investment crowdfunding also differs from other types of crowdfunding in the campaign proponents and in the size of the deals involved. The size of the

campaign target capital is generally larger in investment-based than in reward-based campaigns. Moreover, in crowd investing, offerings are usually launched by companies, whereas in reward-based crowdfunding they are mostly launched by individuals. Furthermore, market participants are usually more risk-averse when it comes to funding large amounts of money than when small amounts are involved (Pahlke *et al.*, 2015). For smaller investments, such as those in reward-based crowdfunding, more investors are therefore likely to consider the added value of contributing to a social cause, due to lower risk aversion (Cumming *et al.*, 2021).

These distinctive features suggest that the determinants of success in investment-based crowdfunding offerings may differ from those in reward-based or donation-based crowdfunding. By extension, the sustainability orientation of a project may affect differently the probability of success of these types of crowdfunding (Vismara, 2019). Likewise, even though investment-based crowdfunding accounts for most of the transactions in the market, it has been studied to a lesser extent than other types of crowdfunding (Böckel *et al.*, 2021). Providing deeper insights into this type of crowdfunding is thus considered to be of interest.

Most crowdfunding research focuses on the pre-funding phase - specifically, analyzing the determinants of success in crowdfunding offerings. Considering sustainability as a factor in the success of crowdfunding campaigns, most theoretical studies would assume a positive influence of sustainability orientation on the likelihood of crowdfunding offerings proving to be successful. This is based on the idea that crowdfunding investor motivations differ from those of traditional investors. According to SRI¹ theory, investors make sustainability-oriented investments because they are aware of the social impact of their decisions and because these investments are in line with their personal values (Hornuf *et al.*, 2021). Specifically, in crowdfunding, some investors may be interested in participating in causes that make them feel they are contributing to the well-being

¹ Socially responsible investment consists of integrating personal values and social concerns into investment decisions (Berry and Junkus, 2013).

of society and the environment, but without forgoing financial reward. These are social and psychological aspects that could be as important as the financial rewards (Lehner, 2013). Likewise, Vismara (2019) showed how sustainable investors might follow a community logic. This means that in their investment selection process they take into account criteria other than purely economic ones, such that their investments may include environmental or social projects. Empirically, Hornuf *et al.*, (2021) analyzed whether the investment behavior of sustainability-oriented crowd investors differed from ordinary crowd investors in equity crowdfunding platforms in Austria and Germany. They found that sustainable-oriented investors pledge larger amounts of money and invest in more offerings than non-sustainable oriented crowd investors.

From an empirical perspective, the results to emerge from the relationship between sustainability and the success of investment crowdfunding offerings remain inconclusive. Some papers show a positive effect of sustainability on success, while others document a negative or a non-existent influence. Calic and Mosakowski (2016) found that social-oriented offerings lead to higher success rates in technology and film/video projects within a reward-based crowdfunding context. Likewise, the creativity of crowdfunding projects and their legitimacy appeared as mediators of this relationship in film/video projects, although only legitimacy emerged as a mediator for technological projects. Bonzanini *et al.* (2016) also considered crowdfunding as an interesting source of funding for environmentally oriented projects and explored the determinants that positively affect the probability of success in ‘green’ projects, such as expected profits or promoter activism on the Web, among others. Bento *et al.* (2019) showed that the sustainable mission of ventures positively influences the campaign outcome in reward-based crowdfunding. Nevertheless, when analyzing 585 crowdfunding campaigns in Indiegogo, Hörisch (2015) reported no positive connection between environmental orientation and success in reward and non-profit crowdfunding. Similarly, Cumming *et al.* (2017) demonstrated that being a *cleantech* project - that is, an environmentally-oriented project - does not affect the offering outcome in reward-based crowdfunding. Lagazio and Querci (2018) also confirmed that social-oriented campaigns do not

have a higher probability of success in reward-based crowdfunding. In fact, the chance of obtaining funding decreased when considering social impact activities. Testa *et al.* (2020) considered that it is more interesting to focus on investigating what characteristics the products or services in sustainable-oriented campaigns require in order to achieve success, rather than analyzing whether crowdfunding is beneficial to sustainable-oriented initiatives. Their research suggests that the emphasis on products with attributes centered on egoism or self, rather than those of a social or altruistic nature, facilitates the success of sustainable-oriented projects in reward crowdfunding.

As regards investment-based crowdfunding, Vismara (2019) stated that a sustainability orientation in equity crowdfunding can lead to more restricted investors, but not to increased funding success. Hörisch and Tenner (2020) investigated how different degrees of the social and environmental orientation of ventures can influence success in investment-based crowdfunding, with their research being based on projects in the US and Germany. The results showed that higher levels of environmental orientation increase the success of crowdfunding, while no relationship between success and social orientation was observed. They also demonstrated the mediating effect of the number of funders on this relationship, with these results proving stronger in the US.

As can be seen, research on crowdfunding and sustainability is still at an early stage. More research is needed to ascertain whether the sustainability of a project is a key factor in the likelihood of an offering's success and whether this influence is positive, as claimed by theory. Exploring which firm and offering characteristics moderate this relationship, as well as what impact other external factors might have, also merits enquiry.

This paper thus seeks to empirically analyze the influence of sustainability on the probability of success of investment crowdfunding offerings and to examine how this influence varies depending on firm- and offering characteristics. We also aim to consider the features of the financing environment. For this purpose, we use a sample of 1,741 investment crowdfunding offerings launched by 1,569 firms in the US over the period May 2016-September 2019 under

Form-C exemption. This exemption for Emerging Growth Companies (EGCs) allows both retail and accredited investors to participate through registered funding portals², following the SEC promulgation of Regulation Crowdfunding pursuant to Title III of the JOBS Act (2012).

The JOBS Act, also known as the CROWDFUND Act, streamlined and considerably reduced the reporting and disclosure requirements of companies issuing securities to retail investors compared to going public through an IPO. While accredited investors have no limitation on how much they can invest through funding portals, retail investors have a limit on these transactions during any 12-month period that depends on their net worth or annual income³. On their side, companies filing under Form-C have to meet certain disclosure requirements and can raise up to five million dollars in any 12-month period⁴.

This paper contributes to the existent literature on sustainability-oriented crowdfunding in different ways. First, we use a unique dataset on investment-based crowdfunding in the US from May 2016 to September 2019. This dataset included 1,741 offerings from 51 funding portals, thereby providing a far larger sample than previously used to analyze the influence of sustainability on success (Hörisch, 2015; Lagazio & Querci, 2018; Vismara, 2019; Hörisch & Tenner, 2020).

Second, after controlling for potential endogeneity concerns affecting the sustainable orientation of investment crowdfunding offerings, we demonstrate that sustainability is a factor that negatively affects the probability of an offering's success. Moreover, the influence of sustainability on success varies across firms and offerings, depending on their specific characteristics. This finding contradicts previous studies (Vismara, 2019; Hörisch and Tenner, 2020), and also reveals that the motivation of crowdfunding investors may not differ from that of

²Funding portals are crowdfunding intermediaries that must register with the SEC. For a complete list see: <https://www.finra.org/about/firms-we-regulate/funding-portals-we-regulate>

³For a definition of accredited investor and the limitations of retail investors see: https://www.sec.gov/oiea/investor-alerts-bulletins/ib_crowdfunding.html

⁴The maximum offering amount under Form C was increased from \$1.07 million to \$5 million in March 2021.

traditional investors, who focus on economic viability rather than on social or environmental aspects. Said finding may also show a lack of investor trust in projects that are defined as sustainable.

Third, we consider the existence of alternative funding sources, such as the banking sector and venture capitalists, and the level of concentration in the market of funding portals as potential moderating factors in the success of sustainable-oriented investment crowdfunding offerings. Results show that these offerings are more likely to be successful if the platform market is more concentrated and venture capitalists are relevant. However, the probability of success is lower if the banking sector is highly profitable. This confirms that crowdfunding is an alternative funding source to traditional ones and that it is complementary to venture capital funding.

Finally, we aim to control for potential asymmetry problems that might affect the success of sustainability-oriented offerings through the characteristics of the firm's corporate governance mechanisms, such as team characteristics, the firm's experience in raising funding, or the cost structure charged by the funding portal. Once all these factors are controlled, the influence of sustainability on the probability of an offering's success remains negative.

The remainder of the paper is organized as follows. In Section 2, the methodology, data, and variables used in the empirical analysis are described. Section 3 presents the empirical results and the robustness tests. Finally, in section 4, the main conclusions are set out.

2. EMPIRICAL METHOD

2.1. Data

We collected data from the *Electronic Data Gathering, Analysis and Retrieval* (EDGAR) system for indexing information from firms that are required by law to file forms with the SEC in the US. Under the JOBS Act regulatory environment - the securities offerings exemptions to the Securities Act of 1933 - EDGAR includes documentation for each of the investment-based crowdfunding

offerings under the *Form C* exemption. We completed the construction of our dataset by including additional information about the characteristics of the financial sector per state and year. Specifically, we included additional information from the Federal Deposit Insurance Corporation (FDIC) and the National Venture Capital Association (NVCA) on the size and activity of the banking sector and venture capitalists in each US state per year.

Initially, we gathered data on all the investment crowdfunding operations available for funding on 51 different funding portals registered in EDGAR. From its inception in May 2016 until September 2019, 1,853 investment crowdfunding campaigns under the *Form C* exemption were launched. In accordance with the collection and construction of the main variables of interest, we finally considered 1,741 investment crowdfunding operations with a deadline in September 2019 or before, issued by 1,569 firms over the period May 2016-September 2019.

[INSERT TABLE 1 ABOUT HERE]

2.2. Econometric model

In order to correctly explain how the sustainability orientation of offerings influences the probability of success, it is necessary to account for the fact that the issuance of sustainable-oriented investment crowdfunding offerings is likely to be endogenously determined. Indeed, the probability of a firm issuing sustainable-oriented offerings cannot be deemed fully exogenous, but might be partly driven by the probability of success of the offering in question. In such a setting - where observations cannot be randomly assigned to different groups - basic pool regressions may not provide consistent estimates. Although in all the cases we lag the firm-level explanatory variables in order to alleviate the influence of endogeneity, we aim to increase the sophistication of our empirical analysis as regards this specific econometric concern. To this end, we apply an instrumental variables (IV) method, which enables us to focus on what impact the exogenous component of the sustainable orientation of investment crowdfunding offerings might have on success rates.

Specifically, we model the decision on issuing sustainable-oriented investment crowdfunding offerings as a dichotomous variable. We run a first-stage probit regression, where the dependent variable is the dummy variable identifying the issuance of sustainable-oriented offerings (*Sustainable*). As explanatory variables, we consider the whole set of variables explaining the probability of offering success in the second stage, plus additional variables that act as exogenous variables to identify the issuance decision. Alternatively, we consider two instruments. First, we use a variable that captures the occurrence of a natural disaster in the country during the year prior to the investment crowdfunding offering (*Natural Disasters*)⁵. Second, we consider the amount of funding injected by public authorities to restore normality after the disaster (*Cost of Natural Disasters*).

The expected sign of the coefficient of these variables is *a priori* unclear. Firstly, the occurrence of a natural disaster could foster sustainable-oriented investment crowdfunding campaigns. From the *stakeholder theory* point of view, and according to Marto *et al.* (2018), it could be argued that investing in resilient (i.e., sustainable) infrastructures may prove useful. This kind of investment could be viewed as complementary to standard infrastructures because they raise the marginal product of private capital, crowding in private investment, while helping to withstand the impact of the natural disaster. Hence, after a natural disaster, firms may be more prone to raise capital through investment crowdfunding offerings in order to finance more sustainable-oriented projects.

Secondly, the occurrence of natural disasters might, on average, increase the level of risk associated to the post-disaster projects of firms located in affected areas. Moreover, and according to the *agency theory*, a negative impact of sustainable investments on financial performance could be argued. Baron (2009) contends that managers may extract rents through more sustainable and socially responsible company practices at the expense of shareholders, while enhancing their

⁵This variable was collected from EM-DAT - The International Disasters Database (<https://www.emdat.be>).

prestige by spending cash. Hence, managers are likely to anticipate investor reaction and decide not to raise new capital in the investment crowdfunding market for sustainable-oriented projects after the occurrence of natural disasters.

Given that we could argue both a positive and a negative effect of natural disasters as well as of the amount of public funding committed when a natural disaster occurs on the probability of launching sustainable-oriented offerings, we deal with this question from an empirical point of view. In addition to selecting the instruments based on economic arguments, we require them to pass relevance statistical tests (correlation with the endogenous variable). We ensure that the first-stage Wald test for the instrument is statistically significant, thereby indicating that they are relevant.

The IV approach allows us to separate the various effects of the sustainable orientation of the investment crowdfunding offering in the equation explaining success. In the second stage, the first-stage fitted values of the sustainable dummy are used as the independent variable to estimate model (1). Therefore, the coefficient β_1 of equation (1) would capture the extent to which the exogenous component of sustainable-oriented offerings influences success. The baseline regression could therefore be written as follows:

$$\begin{aligned}
 \text{SUCCESSFUL}_{ijklt} &= \beta_0 + \beta_1 \text{SUSTAINABLE_predicted}_{ijklt} + \beta_2 \text{FIRM}_{jkl t-1} \\
 &+ \beta_3 \text{OFFERING}_{ijklt} + \theta_k + \delta_l + \lambda_t + \varepsilon_{ijklt}
 \end{aligned}
 \tag{1}$$

where i, j, k, l, t refer to the offering, firm, industry, state, and year, respectively. As the dependent variable (*SUCCESSFUL*), we use *SUCCESS* or *QUICK75*, alternatively. *SUSTAINABLE_predicted* is the proxy variable for the sustainable orientation of investment crowdfunding offerings. We include additional variables that could potentially affect success rates and which are related to the firm ($\text{FIRM}_{jkl t-1}$) and the offering (OFFERING_{ijklt}). In all the estimates, we control for industry fixed-effects (θ_k), as well as for state- and year-level fixed effects

(δ_l and λ_t), respectively. ε_{ijklt} is the error term. Lastly, in order to prevent potential heteroscedasticity and/or autocorrelation problems in the residuals, all the equations are estimated considering robust standard errors.

2.3. Variables

2.3.1. Key variables: success and sustainability orientation

We define three main variables in an effort to capture success in investment crowdfunding operations. First, following Hornuf and Schwienbacher (2018), Vismara (2019) or Andrés *et al.* (2021), among others, we define *SUCCESS* as a dummy variable that takes the value 1 if the amount of money raised is equal to or greater than the target capital, and 0 otherwise. Second, we consider a more stringent interpretation of success and define a dummy variable equaling 1 if the firm raises the target capital during the first 75% of all the days available, and computed from the beginning of the offering until the deadline (*QUICK75*). Panel A of Table 2 shows that 35.15% of the offerings have, on average, been successful when considering the *SUCCESS* variable. In terms of *QUICK75*, 2.64% of investment crowdfunding operations were successful.⁶

As regards the variable that seeks to identify the sustainable orientation of investment crowdfunding operations, we considered the 17 Sustainable Development Goals (SDGs) focused on the end poverty and hunger, ensuring healthy and education as well as well-being, achieving gender equality, ensuring water as well as sanitation and sustainable energy, promoting decent employment, building resilient infrastructure, reducing inequality, ensuring sustainable consumption, combating climate change, conserving oceans, seas, and marine resources, protecting ecosystems, promoting peaceful societies, and strengthening global partnership (UN, 2015). Following Testa *et al.* (2020)'s methodology, the selection of sustainability-oriented offerings was done by a content analysis using traditional human coding. A content analysis is a

⁶ In further robustness, we define *QUICK25* as a dummy that identifies offerings that have raised capital during the first 25% of the total time available (0.4% of percentage of success in our sample), and 0 otherwise. The results hold completely and are available upon request.

formal system that allows to draw conclusions from the content observation of a document and/or web info (Duriau et al., 2007). For this purpose, the coders read the description of the crowdfunding campaigns focusing on the destination of the funds and the products or services offered, reviewed the companies' website, if available, looking at their mission statement and, based on that information, they indicated if the investment objective meets any of the SDGs. Hence, the dummy variable *Sustainable* is defined and it takes the value 1 if an investment crowdfunding offering is consistent with at least one of these goals, and 0 otherwise. As shown in Table 1, 15.27% of the investment crowdfunding offerings in our sample are classified as sustainable. Moreover, 37.96% of the sustainable-oriented investment crowdfunding offerings were successful, whereas the success rate of non-sustainable investment crowdfunding offerings was 34.64%. In terms of *QUICK75*, the mean values are very similar for the two groups of offerings. As can be seen, the mean differences test for the main dependent variables are statistically significant at conventional levels.

2.3.2. Control variables

In order to complete the set of independent variables, we refer to previous studies examining the determinants of success in equity-based crowdfunding, such as Hornuf and Schwienbacher (2018) or Signori and Vismara (2018). Specifically, we consider the natural logarithm of the amount of total assets reported in the balance sheet as a proxy of firm size (*Size*). We also control for the most recent number of employees (*Employees*) and for a variable capturing a firm's age when the offering is launched. In particular, we define this by referring to the incorporation date of the company (*Age*). In order to alleviate potential endogeneity problems, we consider the values of all these variables before the start date of the campaign. The descriptive statistics presented in Table 1 show that, on average, firms have a mean value of total assets in the balance sheet of \$335,793.6, employ an average of 5.4 workers, and are 6.1 years old on average. We also control for specific characteristics of the investment crowdfunding offering. Following

previous studies, in all our estimates we include a dummy variable which captures whether the issued asset is equity or not (*Equity*)⁷ and the amount of target capital (*Target*). Table 1 shows how 26.88% of offerings issued equity⁸, and that the average money target was \$70,587.

3. RESULTS

First, we study how the sustainable orientation of the investment crowdfunding offerings may affect the probability of offering success. To do this, we first apply Propensity Score Matching (PSM). Second, we run an instrumental variables (IV) estimator in order to control for endogeneity that might affect the sustainability decision of the crowdfunding offering. Third, we examine further the relationship between sustainability and the success of investment crowdfunding offerings by testing whether and to what extent this relationship may be shaped by the relevance of firm- and offering-level characteristics. Fourth, we also consider that state-level features, in terms of the characteristics of the banking market, venture capitalists and funding portals, may ultimately influence the extent to which sustainable-oriented offerings foster success. Finally, we present a set of robustness tests.

3.1. Univariate analyses: Propensity Score Matching (PSM)

The descriptive statistics shown in Table 1 allow us to initially compare the characteristics of both non-sustainable and sustainable offerings. Our sample is composed of a relatively low number of sustainable crowdfunding investment offerings (267) compared to non-sustainable offerings (1,476). As can be seen, there are no statistically significant differences in terms of the success variables when comparing the non-matched sample of non-sustainable and sustainable offerings. In terms of the variables that refer to offering characteristics, it can be stated that

⁷ EDGAR filings report specific information about the type of security issued in each offering. Specifically, we identify offerings that have issued equity, debt, convertible, or other kinds of assets. We leave for further robustness tests the distinction between equity security type and the common version of convertible securities in investment crowdfunding: The Simple Agreements for Future Equity (SAFE).

⁸ Annex 1 summarizes the variables used in our empirical analysis and offers a brief description and their sources.

sustainable offerings tend to be launched by more established and experienced companies. Likewise, sustainable offerings are more often funded through equity (31.57%) than non-sustainable offerings (26.03%). These are the basic statistics prior to matching.

As reported in columns (8) to (10) of Table 1, on average, sustainable-oriented investment crowdfunding offerings seem to be older and to issue a higher percentage of equity when compared to non-sustainable-oriented offerings. Moreover, it also emerges that in the subsample of sustainable-oriented offerings, there is a lower presence of traditional banking businesses. As can be seen, both the number of bank branches and the NIM-to-assets ratio are lower in the subsample of offerings. All these differences are statistically significant.

We now run different sample matching approaches that allow us to define a matched sample of investment crowdfunding issues in the matched control group. Offerings in the control group are ex-ante since they are likely to be affected by a potential sustainable orientation of their projects as the offerings in the treatment group. This then allows potential endogeneity concerns to be reduced. Hence, the objective is to match every treated offering (sustainable-oriented) to a control offering (non-sustainable-oriented), matching them by year and closest propensity score.

The first step is to identify similar characteristics between sustainable and non-sustainable offerings in order to create the matched sample. We run two probit regressions from which we select those variables that are explanatory of sustainability orientation and success, and those that only explain success significantly. In particular, these covariates are: *Size*, *Employees*, and *Target Capital*. These variables are used in the matching estimator. We compute three different matching methods: Caliper, Nearest Neighbor and nn-VBC matching. In Panels A and B of Table 2, we report the means of the covariates and the success variables of both the pre- and post-matching sample, respectively. As can be seen in Panel A, there are no significant differences between sustainable and non-sustainable offerings in terms of success variables and covariates. Our aim is to find out whether these differences remain non-significant or whether there is a significant

change in the matched sample. Considering Panel B, which presents the mean differences during post-matching, we see no significant differences between the two groups.

Results in Table 3 show that sustainable offerings display, on average, higher success rates than non-sustainable offerings, whereas for the *SUCCESS* variable, non-sustainable offerings exhibit higher values than sustainable ones. However, none of the success variables for the different matching methods can be seen to have significant coefficients, given that 95% of the confidence intervals include zero. The sustainable orientation of investment crowdfunding offerings does not therefore seem to affect offerings' success. Likewise, the ATET results obtained by the nearest neighbor method are similar to those obtained by nn-VBC method.

[INSERT TABLES 2 AND 3 ABOUT HERE]

3.2. Sustainability and success

Although the results provided above seem to suggest that the probability of success is higher in the case of sustainable-oriented offerings, this difference is not statistically significant at conventional levels. In order to explore further this relationship, a multivariate analysis is needed to better understand whether - and to what extent - the sustainable orientation of investment crowdfunding offerings may affect success rates. This will allow us to include additional state- and industry-level explanatory variables simultaneously. Moreover, one key methodological concern in our empirical approach is that sustainable-oriented offerings are likely to be endogenously determined.

Hence, in this section, we present the baseline results of the IV approach in order to explore further the relationship between the sustainability orientation of investment crowdfunding offerings and their probability of success. The results obtained are shown in Table 4. In columns (1) and (2), we present alternative specifications of the first-stage regression. Specifically, in column (1) we consider the dummy *Natural Disasters* as the exogenous instrument for explaining the probability of an offering being sustainable-oriented. In column (2), we use the amount of public

funding involved in restoring normality after the disaster (*Cost of Disasters*). As can be seen, in both cases we obtain a negative and statistically significant coefficient for the variable that acts as the instrument in the first-stage regression. In particular, this would indicate that both the occurrence of a disaster and the amount of funds injected in order to restore normality in the affected areas, have a negative influence on the sustainable orientation of investment crowdfunding offerings.

Columns (3) to (6) show the second-stage regressions corresponding to each of the first-stage results and using the three different measures of success. In columns (3) and (5), the *SUCCESS* dummy is the dependent variable. *QUICK75* is the dependent variables in columns (4) and (6). In all the estimates, we obtain a negative coefficient for the predicted value of the dummy that captures the sustainable orientation of the investment crowdfunding offerings. This suggests that, on average, sustainable-oriented investment crowdfunding operations are less likely to succeed. This result concurs to some degree with Vismara (2019) and suggests that the average investor does not value the sustainable orientation of investment crowdfunding offerings positively. As stated by Vismara (2019), the effectiveness of a particular feature, or the effects of a signal, not only depends on who owns that feature or on who sends the signal, but also on the characteristics of the recipient. Hence, our results seem to be driven by professional investors in the market who are frequently characterized by their selecting promising projects that generate high returns (Cumming, 2008). Therefore, sustainable and/or social considerations are often not of primary importance to professional investors.

In terms of the effect of firm- and offering-level control variables, we find a positive and statistically significant coefficient for *Age*, indicating that relatively old firms have a higher probability of success when launching investment crowdfunding offerings. The result is only significant, however, when the dependent variable is *SUCCESS*. The variable *Employees* shows a negative and statistically significant coefficient when the dependent variable is *QUICK75*. As for the offering control variables, we obtain a negative and significant coefficient for the *Target Capital*

variable in columns (3) and (5), indicating that the probability of success is lower if the amount of target capital is large. We do not obtain any statistically significant coefficient for the *Equity* variable.

[INSERT TABLE 4 ABOUT HERE]

3.3. Sustainability and success: the role of firm- and offering-level characteristics

After having examined the relationship between sustainability and the probability of success in investment crowdfunding offerings, we now analyze whether potential differences among firms and offerings may shape the influence of the sustainable orientation on success rates. In particular, our aim is to explore further the sustainability-success linkage and to provide additional evidence regarding whether and to what extent the abovementioned relationship varies in the cross-section, depending on the characteristics of the issuing firm and those of the specific offering. As discussed above, the influence of firm- and offering-specific characteristics on success may justify examining whether sustainable-oriented investment crowdfunding offerings may behave heterogeneously vis-à-vis success due to differences at the firm- and offering-level.

We extend our basic model [eq. 1] in order to examine whether firm- and offering-level characteristics shape the influence of sustainability on offering success. In particular, extended model [eq. 2] includes the firm- and offering-level variables considered in the baseline results and the interactions of these variables with the variable accounting for the sustainable orientation of the investment crowdfunding offering. The coefficient of the firm-level variables (β_2) and the coefficient of the offering-level controls (β_3) would reveal whether these characteristics determine the probability of success. The coefficients of the interaction terms (β_4, β_5) would show whether the impact of sustainability on the probability of success is higher (or lower) depending on the features of the firm and the offering. The premise is that although sustainable-oriented offerings have been shown to negatively affect success rates in general terms, specific features of the firm

and the offering may influence success and modulate the relationship between sustainability and success. Hence, the extended model is defined as follows:

$$\begin{aligned}
& \text{SUCCESSFUL}_{ijklt} \\
&= \beta_0 + \beta_1 \text{SUSTAINABLE_predicted}_{ijklt} + \beta_2 \text{FIRM}_{jkl t-1} \\
&+ \beta_3 \text{OFFERING}_{ijklt} + \beta_4 \text{SUSTAINABLE_predicted}_{ijklt} * \text{FIRM}_{jkl t-1} \\
&+ \beta_5 \text{SUSTAINABLE_predicted}_{ijklt} * \text{OFFERING}_{ijklt} + \theta_k + \delta_l + \lambda_t \\
&+ \varepsilon_{ijklt}
\end{aligned}
\tag{2}$$

Table 5 reports the results of the regressions of the extended model [eq. 2].⁹ As can be seen, in almost all the estimates, the coefficient of the predicted value of the sustainable orientation of the investment crowdfunding offering is negative and statistically significant (β_1). This is consistent with the fact that the overall negative effect of sustainability on offering success remains invariant, regardless of the characteristics of the firm and the offering and their moderating role in the relationship between sustainability and success.

We also obtain significant effects for the coefficients of the interaction terms of each firm- and offering-level characteristic and the predicted value of the sustainable orientation (β_4, β_5). Results indicate that the influence of sustainability on success varies across firms and offerings, depending on their specific characteristics. In particular, the interaction term between *SUSTAINABLE_predicted*_{ijklt} and *Age* has a positive coefficient. Although there is, on average, a negative effect of sustainability on success, the effect seems to be reduced if the firm is relatively old. Hence, and as mentioned above, while sustainable-oriented offerings are associated with lower success rates, it seems that this effect is less negative if the firm is perceived to be more experienced. This may in part be due to the relevance of firm age acting as a signal of offering

⁹ It should be noted that the results are presented using the dummy *SUCCESS*, the key dependent variable in our analysis. The results hold when using the *QUICK75* dummy. This set of results is available upon request.

quality, based on experience, as a mitigating factor of the adverse selection problem that traditionally affects sustainable projects.

Our results also show a positive and statistically significant coefficient for the interaction between the predicted value of the sustainable orientation of the offerings and the dummy that captures the type of security issued (*Equity*). This would indicate that sustainable-oriented offerings in which equity instruments are issued reduce the negative impact of sustainability on success. In other words, sustainable equity crowdfunding offerings lead to a significantly higher probability of success.

[INSERT TABLE 5 ABOUT HERE]

3.4. Sustainability and success: the role of the financing environment

Another question of interest is whether the characteristics of each state in terms of alternative funding sources and the market of funding portals for investment crowdfunding may also moderate or magnify the strength of the relationship between sustainability and success. Possible geographical differences in terms of the relevance of alternative sources of financing, such as bank funding or venture capital, or platform market structure, may affect the success rate and how sustainability influences the probability of success.

For a closer examination of this issue, we consider a set of state- and time-variant proxies for the relevance of banking sector and venture capital activity as well as a proxy for platform market structure. Specifically, we consider *Bank branches*, *Bank Net Income to Total Assets*, *VC Fundraising* and *Number of Offerings per Platform*. These variables are taken from the Federal Deposit Insurance Corporation (FDIC), from the National Venture Capital Association (NVCA)¹⁰, and EDGAR. They measure the number of bank branches, the value of the bank net interest income-to-total assets ratio, the value of the total amount of funding raised by venture capitalists per year

¹⁰ Yearbook Data Pack (data provided by PitchBook).

and state in the US, and the annual number of investment crowdfunding offerings managed by each funding portal, respectively.

We extend our baseline model [eq. 1] by including these variables that account for the relative importance of alternative funding sources and platform market structure (β_4) and by interacting these variables with the predicted value of the sustainable orientation of each offering (β_5). This extended model is defined as follows:

$$\begin{aligned}
SUCCESSFUL_{ijklt} &= \beta_0 + \beta_1 SUSTAINABLE_predicted_{ijklt} + \beta_2 FIRM_{jkl,t-1} \\
&+ \beta_3 OFFERING_{ijklt} + \beta_4 MARKET_{lt-1} \\
&+ \beta_5 SUSTAINABLE_predicted_{ijklt} * MARKET_{lt-1} + \theta_k + \delta_l + \lambda_t + \varepsilon_{ijklt}
\end{aligned}
\tag{3}$$

$MARKET_{lt-1}$ refers to each of the variables related to the role of alternative funding sources as well as for the platform market structure. In Table 6, we present the results obtained. The coefficient for the predicted value of the sustainable orientation of the investment crowdfunding offerings (β_1) is negative and statistically significant. This result suggests that, even when accounting for alternative funding sources as well as for the structure of the platform market, sustainable-oriented offerings have a lower probability of success.

As regards the interaction terms, we obtain a negative and statistically significant coefficient for the interaction term between the predicted value of sustainability and the bank net income-to-total assets ratio. This result provides evidence that the effect of sustainability on the probability of success is less negative if the banking sector is less profitable. In other words, in states characterized by highly profitable banking sectors, the probability of success of a sustainable-oriented investment crowdfunding offering is lower. This finding suggests the existence of a substitute effect between the banking sector and investment crowdfunding as a means of securing funding. In a more profitable banking sector, banks are more capable of correctly screening projects and could be more prone to invest in acquiring *soft information* about the issuer, thereby

reducing information asymmetry concerns: hence, the likelihood of a company obtaining financing from a bank for their sustainable projects is higher.

We find a positive and statistically significant coefficient for the interaction term between the sustainability variable and the variable that captures the relevance of venture capitalists, suggesting the existence of a complementary effect between this type of financing and investment crowdfunding. To some extent, this would be consistent with Nesta (2016) and Estrin *et al.* (2018) who posit that investment crowdfunding does not represent a deviation of flows from more traditional channels of entrepreneurial finance, but rather a new channel of early-stage entrepreneurial finance. Hence, it seems logical that sustainable-oriented investment crowdfunding offerings should find it easier to obtain funds if the market for entrepreneurial finance is more developed.

As for the interaction term with the variable that proxies for platform market structure, our results show a positive and statistically significant coefficient, indicating that sustainable-oriented investment crowdfunding offerings are more likely to be successful if the platform market is more concentrated. Taking sustainable projects as more affected by asymmetric information than on-average non-sustainable projects, market concentration may give platforms more of an incentive to invest in acquiring *soft information* by establishing close relationships with issuing firms and facilitating the screening of good and bad projects. This could therefore enhance the chances of success for this type of project.

[INSERT TABLE 6 ABOUT HERE]

3.5. Robustness tests

3.5.1. Sample selection bias

In order to control further for potential sample selection bias and endogeneity problems between the sustainable orientation of an investment crowdfunding offering and its likelihood of success, we perform a two-stage Heckman (1979) regression analysis. As in the IV analysis, we

model the probability of an offering being classified as sustainable as a dichotomous variable. In particular, we run a first-stage probit regression where the dependent variable is the dummy variable identifying the sustainable-oriented offerings. This allows us to estimate λ , the inverse Mill's ratio of the decision concerning whether or not to issue sustainable-oriented investment crowdfunding offerings. As explanatory variables, we consider the whole set of variables explaining success in the second stage, plus an additional variable acting as exogenous variables to identify the sustainability decision¹¹.

The results of the two-stage Heckman selection model are presented in column (1) of Table 7. As can be seen, the inverse Mill's ratio (λ) enters the regression with a non-statistically significant coefficient. This empirical finding suggests that unobserved factors which make sustainable investment crowdfunding offerings more likely are not significantly associated with success. We can therefore state that our empirical analysis is not affected by potential sample selection problems.

3.5.2. *Information asymmetry reduction-mechanisms*

We now examine whether the results hold after controlling for a set of firm- and offering-level characteristics that might affect the probability of success of investment crowdfunding offerings through its influence on the degree of information asymmetry perceived by investors. Controlling for these aspects is necessary in order to rule out the possibility that effects attributed to the sustainable orientation of the investment crowdfunding offerings are not caused by alternative firm- and offering-level characteristics that could affect information asymmetry.

First, we include variables related to the characteristics of the funder-managerial team of the issuing firm, since these might be related to the severity of information asymmetry associated to each investment crowdfunding offering. We therefore control for the variables *Female* and *Team*

¹¹ As in the IV analysis, we use the occurrence of natural disasters as an instrument. The results are robust if the amount of capital injected by public authorities after a natural disaster is considered.

size. *Female* is a dummy variable that captures the presence of women in the team. *Team size* proxies the size of the company's funder-managerial team, measured through the number of signatures related to the offering. Both variables have traditionally been considered as proxies of a good corporate governance strategy developed by the company (see, for instance, Coles *et al.*, 2008 or Kang *et al.*, 2010).

We report the results in column (2) of Table 7. As can be seen, the negative and statistically significant coefficient obtained for the sustainability variable holds completely. Moreover, we obtain a positive coefficient for *Female* that is statistically significant at conventional levels. We can thus state that the presence of women on the team positively influences the likelihood of investment crowdfunding offerings being successful. This finding could be to some extent related to papers which have found that women may help to establish better stakeholder communication and form better links between the firm and external stakeholders (Hillman *et al.*, 2007). Moreover, female presence on teams may also improve transparency and disclosure, as women provide greater insight and closer monitoring (Abad *et al.*, 2017). Hechavarria *et al.* (2012) also show that women are more likely to engage in social and environmental entrepreneurship activities than men. In a more recent paper, Benjamin *et al.*, (2020) show that board gender composition is positively associated with sustainability and, in particular, with sustainable supply chain responsibility.

In terms of team size, we also obtain a positive coefficient, suggesting that investment crowdfunding offerings have a greater chance of success if the team is larger. This result could be in line with Wang (2012), who finds that companies with smaller teams take lower leverage but more risky investments. Moreover, the author also shows that, after controlling for the effects of financial decisions on overall firm risk, companies with smaller teams are associated with higher future risk.

Second, another relevant aspect that might affect the chances of a successful investment crowdfunding offering is the firm's experience of raising funds, as this could be seen as an additional signal aimed at reducing information asymmetry and, thereby, a mechanism through which the probability of success could be affected. Following Shafi and Colombo (2020) or Andrés *et al.*, (2021), we include two dummy variables - *Form C* and *Form D* - that capture whether the issuer launched a previous Form C (investment crowdfunding offering) or a Form D (private equity targeting accredited investors) prior to the current offering. In columns (3) and (4) of Table 7, we observe that the individual coefficient of the sustainable variable remains negative and significant. Moreover, we obtain a statistically significant coefficient for both dummy variables *Form D* and *Form C*, indicating that the funding history of the company does play a role in terms of explaining the current investment crowdfunding offering's chances of success. Consistent with Andrés *et al.* (2021), we report a positive effect associated with past private issues (*Form D*), whereas the dummy *Form C* shows a negative coefficient, indicating that experience in raising capital through investment crowdfunding offerings does not foster success in the current operation. We also define the variable *Previous Form D_C* that captures whether the company has raised new capital through either a Form D or a Form C offering. Although positive, its coefficient is not significant at conventional levels (column (5)).

Finally, we also consider the extent to which information asymmetry could be reduced through the role played by the funding portal when defining the cost structure charged to the issuing firm. According to Andrés *et al.*, (2021), when the fee charged combines a gross fee and financial securities, this acts as a signal sent by the funding portal regarding the quality of the offering as a mitigating factor of the adverse selection problem, thereby positively influencing the probability of success. We therefore define the dummy variable *Cost Structure*, which equals 1 when the funding portal charges the issuer a gross fee and a share of the securities issued, and 0 otherwise. Column (6) reports the results obtained. As in the previous cases, the negative and statistically significant coefficient of the sustainable variable remains unchanged, indicating that

regardless of the cost structure defined by the funding portal, there is still a negative relationship between the sustainable orientation of the investment crowdfunding offering and its likelihood of success. Consistent with Andrés *et al.* (2021), the variable *Cost Structure* shows a positive coefficient, although it is not significant at conventional levels.

[INSERT TABLE 7 ABOUT HERE]

4. CONCLUSIONS

This paper examines the relationship between the sustainability orientation of investment crowdfunding offerings and the probability of success. In light of the greater information asymmetries traditionally associated to more sustainable and socially oriented projects, our basic result is that the probability of success is lower in the case of sustainable-oriented investment crowdfunding offerings. This relation is empirically robust to considering different dependent variables proxying for success, to the inclusion of additional firm- and offering-level characteristics, and to potential endogeneity concerns.

Our empirical findings also show that the basic relationship is not homogenous across firms, as it has been shown to be stronger in the case of younger firms. Moreover, offerings that issue equity and have a low target amount of capital are more likely to be successful. The relationship between sustainability and success also holds after controlling for the relevance of alternative funding sources, such as the banking sector or venture capital funding, and the structure of the platform market. Moreover, banking financing emerges as a substitute mechanism to sustainability for promoting success in investment crowdfunding operations. Venture capital financing and platform market concentration seem to positively influence the relationship between sustainability and success rates.

As a clear direct implication, our empirical analysis sheds light on the role played by firm and offering characteristics, as well as other features of the financial system in which the firm operates, in terms of fostering the success of sustainable-oriented investment crowdfunding

offerings. However, the negative influence of sustainability on the likelihood of success remains. Yet this should not overshadow the role played by firm- and offering-level features as well as by alternative funding sources as effective mechanisms for increasing the likelihood of success.

Overall, while evidencing the role of investment crowdfunding as a way to solve the existing gap in early-stage financing for entrepreneurs, we show the role played not only by firm- and offering-level characteristics but also by a particular offering characteristic, such as its sustainable orientation, in terms of affecting successful investment crowdfunding offerings.

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Annex 1: Description of variables and sources

This table describes the variables used in the analysis and the corresponding sources.

Variable	Description	Source
<i>SUCCESS</i>	Dummy variable that takes the value 1 if the raised-to-target ratio is equal to or greater than 1, and 0 otherwise.	Own elaboration with EDGAR data
<i>QUICK75</i>	Dummy variable that takes the value 1 if the firm raises the target capital within 75% of the target time, taking the offering deadline as the main reference, and 0 otherwise.	Own elaboration with EDGAR data
<i>Sustainable</i>	Dummy variable that equals 1 if an investment crowdfunding offering is consistent with at least one of the 17 SDG defined by the UN, and 0 otherwise.	Own elaboration
<i>Natural Disasters</i>	Dummy variable that equals 1 if a natural disaster occurred in the state during the year prior to the investment crowdfunding offering, and 0 otherwise.	EM-DAT The International Disasters Database (https://www.emdat.be).
<i>Cost of Natural Disasters</i>	Natural logarithm of the amount of funds injected by public authorities after the occurrence of a natural disaster.	EM-DAT The International Disasters Database (https://www.emdat.be).
<i>Age</i>	Natural logarithm of the number of days from the incorporation date of the firm to the start date of the offering.	EDGAR
<i>Employees</i>	Natural logarithm of the number of employees before the offering was launched.	EDGAR
<i>Size</i>	Natural logarithm of total assets in the balance sheet of the firm before the offering was launched.	EDGAR
<i>Target Capital</i>	Target capital of the offering.	EDGAR
<i>Equity</i>	Dummy variable that equals 1 if the firm issues equity in the offering, and 0 otherwise.	EDGAR
<i>Bank branches</i>	Natural logarithm of the number of bank branches per state and year.	Federal Deposit Insurance Corporation (FDIC)
<i>Bank Net Income to Total Assets</i>	Value of the ratio net income-to-total assets in the banking sector per state and year.	Federal Deposit Insurance Corporation (FDIC)
<i>VC Fundraising</i>	Natural logarithm of the total amount of funds raised by venture capital per state and year.	National Venture Capital Association (NVCA)
<i>Number Offerings per Platform</i>	Natural logarithm of the annual number of investment crowdfunding offerings managed by each funding portal.	Own elaboration with EDGAR data
<i>Female</i>	Dummy variable that equals 1 if there are women on the team of directors.	Own elaboration with EDGAR data
<i>Team size</i>	The natural logarithm of the number of people that sign each offering.	Own elaboration with EDGAR data
<i>Form D</i>	Dummy variable that equals 1 if the issuer launched a previous Form D, and 0 otherwise.	Own elaboration with EDGAR data
<i>Form C</i>	Dummy variable that equals 1 if the issuer launched a previous Form C, and 0 otherwise.	Own elaboration with EDGAR data
<i>Previous Form D_C</i>	Dummy variable that equals 1 if the issuer launched either a previous Form C or a previous Form D, and 0 otherwise.	Own elaboration with EDGAR data
<i>Cost structure</i>	Dummy variable that equals 1 when the funding portal charges the issuer a gross fee and a share of the securities issued, and 0 otherwise.	Own elaboration with EDGAR data

Table 1: Descriptive statistics

This table shows the descriptive statistics – mean, standard deviation, 25th percentile, median, 75th percentile – of the main variables of interest (columns (1) to (7)). Columns (8) to (10) show the mean values of the main variables across the two subsamples of offerings and the T-statistic for the mean differences. The T-statistics reported are obtained for the differences between the means across groups of offerings. All the variables are defined in Annex 1. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Variable	#Obs.	#Firms	Mean	St. Dev.	25%	Median	75%	Non-Sustainable Offering	Sustainable Offering	T-statistic
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>SUCCESS</i>	1,741	1,569	0.3515	0.4775	0	0	1	0.3464	0.3796	-1.0455
<i>QUICK75</i>	1,741	1,569	0.0264	0.1604	0	0	0	0.0271	0.0225	0.4268
<i>Sustainable</i>	1,741	1,569	0.1527	0.3598	0	0	0	-	-	-
<i>Size</i>	1,741	1,569	335,793.6	1,774.292	0	26,369	200,940	328,540.1	376,015	0.6880
<i>Employees</i>	1,741	1,569	5.3946	10.3752	1	3	6	5.5254	4.6691	0.2155
<i>Age</i>	1,741	1,569	6.1067	1.4553	5.3082	6.3456	7.1467	6.0721	6.2981	-2.3342**
<i>Equity</i>	1,741	1,569	0.2688	0.4434	0	0	1	0.2603	0.3157	-1.8784*
<i>Target Capital</i>	1,741	1,569	70,587.32	118,077.3	10,000	25,000	86,257	70,269.75	72,348.23	-0.2642
<i>Bank branches</i>	1,741	1,569	3,956.5	2,357.26	1,473	4,260	6,728	4,032.37	3,536.17	3.1682***
<i>Bank Net Income to Total Assets</i>	1,741	1,569	1.0351	0.5622	0.8187	0.8857	1.0894	138.87	108.02	3.6855***
<i>VC Fundraising</i>	1,741	1,569	7,793.8	10,775.84	56.36	574.02	20,763.1	7,851.09	7,476.15	0.5222
<i>Number Offerings per Platform</i>	1,741	1,569	67.1068	65.4805	8	36	109	67.1898	66.6466	0.1245

Table 2: Propensity Score Matching

This table shows the mean values of the main variables across the two subsamples of offerings and the t-statistics obtained for the differences between the means across groups of offerings, before matching and after matching using caliper, nearest 1-to-1 and nn-VBC methods. ***, ** and * indicate statistical significance at 1, 5, and 10%, respectively.

	Sustainable Offering	Non-sustainable Offering	Difference	t-Test
Panel A: Before matching				
<i>SUCCESS</i>	0.3782	0.3468	0.03139	0.99
<i>QUICK75</i>	0.0224	0.0277	-0.0053	-0.49
<i>Size</i>	8.2165	8.0003	0.2161	0.6093
<i>Employees</i>	1.3781	1.4395	-0.0613	-1.0948
<i>Target Capital</i>	10.323	10.435	-0.1113	-1.4562
Panel B: After matching				
Matching method: Caliper 1-to-1				
<i>SUCCESS</i>	0.3782	0.3932	-0.0149	-0.35
<i>QUICK75</i>	0.0224	0.0412	-0.0187	-1.23
<i>Size</i>	8.2165	8.2207	-0.0042	-0.0093
<i>Employees</i>	1.3781	1.4154	-0.0372	-0.5421
<i>Target Capital</i>	10.323	10.268	0.0553	0.5572
Matching method: Nearest 1-to-1				
<i>SUCCESS</i>	0.3782	0.3633	0.0149	0.36
<i>QUICK75</i>	0.0224	0.0449	-0.0224	-1.44
<i>Size</i>	8.2165	8.6911	-0.4745	-0.9960
<i>Employees</i>	1.3781	1.4587	-0.0805	-1.0979
<i>Target Capital</i>	10.323	10.312	0.0110	0.1025
Matching method: nn-VBC				
<i>SUCCESS</i>	0.3782	0.3633	0.0149	0.36
<i>QUICK75</i>	0.0224	0.0449	-0.0224	-1.44
<i>Size</i>	8.2165	7.9722	0.2443	0.54
<i>Employees</i>	1.3781	1.4155	-0.0373	-0.54
<i>Target Capital</i>	10.323	10.225	0.099	0.99

Table 3: Average Treatment Effect on the Treated (ATET)

This table shows the average treatment effect on the treated individuals (ATET) for each method: caliper, nearest 1-to-1 and nn-VBC methods. ***, ** and * indicate statistical significance at 1, 5, and 10%, respectively.

ATET	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Matching method: caliper 1-to-1						
SUCCESS	0.0078171	0.0411681	0.19	0.849	-0.0728708	0.0885051
QUICK75	-0.0093782	0.0124897	-0.75	0.453	-0.0338574	0.0151011
Matching method: nearest 1-to-1						
SUCCESS	0.0524489	0.0391569	1.34	0.18	-0.0242972	0.129195
QUICK75	-0.0061322	0.011753	-0.52	0.602	-0.0291678	0.0169033
Matching method: nn-VBC						
SUCCESS	0.0526014	0.039146	1.34	0.179	-0.0241234	0.1293262
QUICK75	-0.0059641	0.0117613	-0.51	0.612	-0.0290159	0.0170877

Table 4: Sustainability and success

This table presents IV results examining the effect of the sustainable orientation of investment crowdfunding offerings on the probability of success. The dependent variable in columns (1) and (2) is the dummy that identifies sustainable offerings (*Sustainable*). The dependent variable in columns (3) and (5) is *SUCCESS*. *QUICK75* is the dependent variables in columns (4) and (6). Variables definitions are reported in Annex 1. Year, industry-year and state-year fixed effects are included but not reported. T-statistics are in parentheses. ***, ** and * indicate statistical significance at 1, 5, and 10%, respectively.

	First-Stage Dependent Variable: <i>Sustainable</i>	First-Stage Dependent Variable: <i>Sustainable</i>	Second-Stage Dependent Variable: <i>SUCCESS</i>	Second-Stage Dependent Variable: <i>QUICK75</i>	Second-Stage Dependent Variable: <i>SUCCESS</i>	Second-Stage Dependent Variable: <i>QUICK75</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Natural Disasters</i>	-0.2840*** (-2.95)					
<i>Cost of Natural Disasters</i>		-0.0196*** (-2.68)				
<i>Sustainable</i>			-2.5453** (-2.32)	-1.6164 (-0.80)	-2.2683* (-1.87)	-3.3002* (-1.66)
<i>Size</i>	-0.0050 (-0.55)	-0.0052 (-0.57)	-0.0039 (-0.49)	0.0032 (0.22)	-0.0038 (-0.47)	0.0020 (0.13)
<i>Employees</i>	-0.1120** (-2.64)	-0.1100** (-2.30)	0.0639 (1.27)	-0.2926** (-2.38)	0.0708 (1.38)	-0.3356*** (-2.71)
<i>Age</i>	0.0850*** (2.63)	0.0863*** (2.67)	0.0969*** (2.81)	-0.0116 (-0.18)	0.0924*** (2.60)	0.0192 (0.29)
<i>Equity</i>	0.1723* (1.96)	0.1697* (1.94)	-0.1173 (-1.32)	-0.0816 (-0.41)	-0.1296 (-1.43)	-0.0098 (-0.05)
<i>Target Capital</i>	-0.0403 (-1.10)	-0.0440 (-1.20)	-0.2916*** (-9.09)	-0.0070 (-0.11)	-0.2897*** (-8.84)	-0.0261 (-0.40)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
State-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Log pseudolikelihood	-709.81	-710.59	-1,042.99	-203.53	-1,043.90	-203.10
Wald Chi2 (Prob)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	1,741	1,741	1,741	1,741	1,741	1,741
Number of firms	1,569	1,569	1,569	1,569	1,569	1,569

Table 5: Sustainability and success: the role of firm- and offering-level characteristics

This table presents results examining the effect of firm- and offering-level characteristics on the relationship between the sustainable orientation of investment crowdfunding offerings and the probability of success. The dependent variable is *SUCCESS*. Variables definitions are reported in Annex 1. Year, industry-year and state-year fixed effects are included but not reported. T-statistics are in parentheses. *** and ** indicate statistical significance at 1 and 5 percent, respectively.

	(1)	(2)	(3)	(4)	(5)
<i>Sustainable</i>	-2.7822** (-1.97)	-3.2873** (-2.37)	-6.2773*** (-2.67)	-3.2807** (-2.44)	6.6618 (1.52)
<i>Sustainable * Size</i>	0.0586 (0.68)				
<i>Sustainable * Employees</i>		0.8112 (1.49)			
<i>Sustainable * Age</i>			0.5765** (1.96)		
<i>Sustainable * Equity</i>				2.0831** (2.08)	
<i>Sustainable * Target Capital</i>					-0.9169** (-2.07)
<i>Size</i>	-0.0126 (-0.81)	-0.0035 (-0.43)	-0.0055 (-0.68)	-0.0040 (-0.50)	-0.0042 (-0.52)
<i>Employees</i>	0.0715 (1.39)	-0.0473 (-0.50)	0.0651 (1.26)	0.0614 (1.18)	0.0608 (1.16)
<i>Age</i>	0.0925*** (2.60)	0.0909** (2.55)	0.0196 (0.38)	0.0986*** (2.75)	0.1023*** (2.81)
<i>Equity</i>	-0.1266 (-1.40)	-0.1377 (-1.52)	-0.1141 (-1.26)	-0.4754** (-2.53)	-0.1277 (-1.40)
<i>Target Capital</i>	-0.2904*** (-8.89)	-0.2896*** (-8.86)	-0.2946*** (-8.99)	-0.2926*** (-8.85)	-0.1574** (-2.30)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry-Year Dummies	Yes	Yes	Yes	Yes	Yes
State-Year Dummies	Yes	Yes	Yes	Yes	Yes
Log pseudolikelihood	-1,043.67	-1,042.79	-1,042.20	-1,041.77	-1,041.77
Wald Chi2 (Prob)	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	1,741	1,741	1,741	1,741	1,741
Number of firms	1,569	1,569	1,569	1,569	1,569

Table 6: Sustainability and success: the role of the financing environment

This table presents results examining the effect of the characteristics of the financing environment on the relationship between the sustainable orientation of investment crowdfunding offerings and the probability of success. The dependent variable is *SUCCESS*. Variables definitions are reported in Annex 1. Firm and offering control variables, year, industry-year and state-year fixed effects are included but not reported. T-statistics are in parentheses. ***, ** and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	(1)	(2)	(3)	(4)
<i>Sustainable</i>	-1.9664* (-1.71)	-2.1628* (1.65)	-2.2787* (-1.65)	-5.4828*** (-2.96)
<i>Sustainable * Bank Branches</i>	-0.0002 (-1.05)			
<i>Sustainable * Bank Net Income to Total Assets</i>		-0.0132*** (-2.92)		
<i>Sustainable * VC Fundraising</i>			0.2632** (1.98)	
<i>Sustainable * Number Offerings per Platform</i>				0.8338** (2.45)
<i>Bank Branches</i>	0.0000 (0.84)			
<i>Bank Net Income to Total Assets</i>		0.0011** (2.32)		
<i>VC Fundraising</i>			-0.0225 (-1.00)	
<i>Number Offerings per Platform</i>				-0.1580*** (-2.81)
Controls	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry-Year Dummies	Yes	Yes	Yes	Yes
State-Year Dummies	Yes	Yes	Yes	Yes
Log pseudolikelihood	-1,042.50	-1,038.94	-1,042.25	-1,038.64
Wald Chi2 (Prob)	0.0000	0.0000	0.0000	0.0000
Observations	1,741	1,741	1,741	1,741
Number of firms	1,569	1,569	1,569	1,569

Table 7: Sustainability and success: robustness tests

This table presents a set of robustness tests for the relationship between the sustainable orientation of investment crowdfunding offerings and the probability of success. In column (1), we report the results for the second-stage regression for the Heckman (1979) method. In column (2), we find that the results do not vary when controlling for the characteristics of the team in terms of gender and size. In columns (3) to (5), we control for the funding history of the company. In column (6), we control for the cost structure defined by the funding portal. The dependent variable is *SUCCESS*. Variables definitions are reported in Annex 1. Firm and offering control variables, year, industry-year and state-year fixed effects are included but not reported. T-statistics are in parentheses. ***, ** and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Inverse Mills Ratio</i>	0.5578 (0.86)					
<i>Sustainable</i>		-2.2347* (-1.83)	-2.4078** (-2.00)	-2.3410* (-1.95)	-2.3569** (-1.96)	-2.0313* (-1.68)
<i>Female</i>		0.1534* (1.80)				
<i>Team size</i>		0.3268*** (3.11)				
<i>Previous Form D</i>			0.3174*** (3.28)			
<i>Previous Form C</i>				-0.2104* (-1.79)		
<i>Previous Form D_C</i>					0.1334 (1.56)	
<i>Cost Structure</i>						0.0847 (1.14)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
State-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Log pseudolikelihood	-861.72	-1,038.94	-1,035.12	-1,043.24	-1,040.39	-1,042.87
Wald Chi2 (Prob)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	1,741	1,741	1,741	1,741	1,741	1,741
Number of firms	1,569	1,569	1,569	1,569	1,569	1,569