Sustainability-Oriented Institutions and the Success of Green Reward-Based Crowdfunding Campaigns

Vincenzo Butticè, Politecnico di Milano

Massimo G. Colombo, Politecnico di Milano

Carlotta Orsenigo, Politecnico di Milano

This manuscript has been accepted for publication in *Entrepreneurship Theory and Practice*. Please cite the published article as:

Butticè, V., Colombo, M. G., & Orsenigo, C. (2026). *Sustainability-Oriented Institutions and the Success of Green Reward-Based Crowdfunding Campaigns*. Entrepreneurship Theory and Practice. https://doi.org/10.1177/10422587261415928

The final publisher version is available at: https://doi.org/10.1177/10422587261415928

Sustainability-oriented institutions and the success of green reward-based crowdfunding campaigns

Abstract: Previous research has produced mixed evidence on the success of green crowdfunding campaigns. We investigate whether country-level environmental institutions help explain these inconsistencies by moderating backers' responses. While such institutions may enhance campaign legitimacy, they can also reduce the perceived urgency to contribute by offering alternative support channels. Analyzing a large Kickstarter dataset with machine learning, we find that green campaigns are less likely to succeed, particularly in countries with stronger environmental institutions. Post-hoc analyses point to a crowding-out effect of institutional support, which dampens individual backing, and suggest that omitted variable bias may partly account for prior conflicting results.

Keywords: Crowdfunding, green ventures, institutions, random forest, Kickstarter.

1. Introduction

Today, an increasing number of individuals prioritize environmental considerations in their economic choices, aiming to preserve environmental resources (Panda et al., 2020), with some identifying this as a primary motivation (Shao & Ünal, 2019). This shift has also influenced entrepreneurship. New ventures are increasingly centred on environmental preservation and widely recognized as vital to advancing the environmental transition (Dean & McMullen, 2007; Howard-Grenville et al., 2014; Mazzucato, 2015).

Nonetheless, green ventures face significant challenges in securing early-stage financing due to the complexity and novelty of green technologies (Barbieri et al., 2020), as well as their exposure to regulatory and political risks and uncertain market prospects (Veugelers, 2012; Polzin et al., 2015). These factors increase the uncertainty of green ventures' long-term returns, making them less attractive to professional investors, such as traditional venture capital (VC) investors[1] (Criscuolo & Menon; 2015; Gaddy et al., 2017; Mrkajic et al., 2019; Croce et al., 2024).

Reward-based crowdfunding has often been portrayed as a promising funding channel for green entrepreneurial projects. Many prospective backers are motivated not only by

[1] Throughout the paper, our references to venture capital pertain solely to traditional private VC investors, and do not include impact or mission-driven VC funds.

tangible rewards but also by environmental concerns (Allison et al., 2015; Calic & Mosakowski, 2016). Despite these premises, empirical studies investigating the success of green crowdfunding campaigns have yielded mixed results (see Böckel et al., 2021; Wehnert & Beckman, 2021 for recent reviews). As we will illustrate in the next section, some findings (e.g., Calic & Mosakowski, 2016; Barone, 2025) suggest that sustainability enhances crowdfunding outcomes, while others reveal neutral (e.g., Hörisch, 2015; Cumming et al., 2017) or even negative (Roma et al., 2023) effects. These mixed findings may originate from differences across studies in the composition of sampled campaigns, the platforms and countries considered, the representativeness of the target populations, the classification methods used to identify green campaigns, and the econometric specifications adopted. This heterogeneity underscores the need for a more context-sensitive understanding of when and why green campaigns are more or less successful than others.

We argue that one important and so far overlooked explanation for these mixed findings lies in the characteristics of the institutions of the countries from which campaigns are launched, as reflected in formal regulations, policies, and informal norms (North, 1990; Scott, 2005; Meek et al., 2010). Specifically, the degree to which institutions are oriented toward environmental sustainability affects how prospective backers evaluate green campaigns and their likelihood of success. On the one hand, stronger institutional support can increase the legitimacy and perceived viability of green projects, indicating that they operate in a supportive and credible ecosystem where they can leverage a significant stock of relevant innovative knowledge. On the other hand, in countries with extensive institutional support for green initiatives, prospective backers may perceive that their personal contributions are less needed, reducing the urgency to act. Indeed, in these countries, green projects can tap other (public and private) funding sources. In sum, it is not evident whether country-level institutional support ultimately enhances or hinders the success of green crowdfunding campaigns. Examining this institutional dimension can deepen our understanding of the mechanisms at play and help explain the conflicting findings in the empirical literature on this topic (Böckel et al., 2021; Wehnert & Beckman, 2021).

In this research brief, we examine how the environmental orientation of country-level institutions moderates the relationship between campaign greenness and crowdfunding success. We rely on the Environmental Performance Index (EPI) as a proxy for institutional support for sustainability (Thomakos & Alexopoulos, 2016), and apply a machine learning approach (specifically, a Random Forest algorithm; Breiman, 2001) to classify campaigns as green or non-green. Our empirical setting consists of 8,912 Kickstarter campaigns launched in 2016–2017 from European countries. These countries exhibit substantial variation in the orientation of their institutions toward environmental sustainability, while having a comparable economic context. In an additional analysis, we considered U.S. campaigns and also tested our hypotheses on the campaigns launched in the same period across different U.S. states that exhibit various levels of institutional support for green projects.

Our analysis yields three main insights. First, green campaigns are less likely to reach their funding goal than comparable non-green ones, confirming the funding challenges faced by environmentally oriented ventures (Ghosh & Nanda, 2010; Mrkajic et al., 2019). Second, this negative association is stronger in countries with higher EPI scores. Third, a post-hoc analysis suggests two opposing mechanisms behind this pattern: green campaigns in high-EPI countries benefit from a richer green knowledge base (e.g., green patents), but face reduced support due to the greater availability of alternative funding sources (e.g., green VC). As a result, environmentally supportive institutional contexts may hinder crowdfunding success for green campaigns. Our findings contribute to the literature in two main ways. First, we address the empirical puzzle in prior work about the success of green crowdfunding campaigns and suggest that the lack of consideration for the institutional heterogeneity across countries (and

U.S. states) may partially explain the divergent results of previous studies. We also point to a possible omitted variable bias in some of those studies. Indeed, our additional mediation analysis shows that campaigns' greenness has a negative direct association with campaign success and a positive indirect one mediated by the amount of information campaign proponents convey to prospective backers. Second, we contribute to the literature on the role of institutions in entrepreneurial finance by highlighting an unintended detrimental consequence of strong institutional support for green ventures. While such support typically benefits green innovation and investment (Criscuolo & Menon, 2015; Aghion et al., 2016), it may crowd out crowdfunding support, reducing its effectiveness for green entrepreneurship.

2. Background and hypotheses

2.1. The crowdfunding of green entrepreneurial initiatives

Despite increasing attention to sustainable finance (Dong et al., 2021; Maiti, 2022; Dhayal et al., 2023), green ventures still face substantial difficulties in securing early-stage funding from traditional professional investors. Venture capitalists have historically been reluctant to invest in green ventures due to the high uncertainty surrounding their technologies, business models, and market prospects (Demirel & Parris, 2015; Petkova et al., 2014). Their dependence on volatile environmental regulations and policy support schemes adds another layer of risk (Bürer & Wüstenhagen, 2009; Kesidou & Demirel, 2012; Veugelers, 2012; Migendt et al., 2017). These factors amplify information asymmetries between entrepreneurs and investors, making green ventures especially unattractive for traditional VC investors (Mrkajic et al., 2019). Moral hazard further undermines post-investment alignment, as green entrepreneurs may prioritize environmental impact over financial returns, diverging from investors' objectives (O'Reilly et al., 2025). Combined with structural risks, this makes green ventures poorly aligned with traditional VC models and limits their access to early-stage external equity capital (Ghosh & Nanda, 2010; Hargadon & Kenney, 2012).

In this context, reward-based crowdfunding has emerged as a promising alternative financing channel for green initiatives. Unlike traditional investors, many backers are driven by prosocial and environmental motivations (Gerber et al., 2012; Calic & Mosakowski, 2016; Dai & Zhang, 2019), making them more receptive to the mission-driven nature of green campaigns. Crowdfunding thus serves not only as a funding mechanism but also as a participatory platform connecting environmentally oriented ventures with supportive communities (Vasileiadou et al., 2016). Despite these premises, empirical research on the performance of green campaigns in reward-based crowdfunding remains fragmented (Böckel et al., 2021; Wehnert & Beckman, 2021). Table 1 summarizes previous studies investigating the relationship between the greenness of campaigns and their success.

//Table 1 about here//

These studies relied on different platforms, used samples of varying size and representativeness, examined campaigns from diverse countries and time periods, applied different criteria to identify green campaigns, and adopted distinct econometric specifications with varying sets of controls. As a result, their findings diverged.

For instance, Calic and Mosakowski (2016) focused on a rather small sample of Kickstarter campaigns in the technology and film/video categories. They found that in the technological category, campaigns' green orientation increases success, and this effect is partially mediated by project creativity and third-party endorsement. However, these results did not generalize to the film/video category. Barone (2025) also examined a sample of Kickstarter campaigns, used a machine learning algorithm to determine the category to which a focal campaign was assigned, and found that campaigns assigned to the "environmental and social sustainability" category were more likely to be successful and raised larger amounts. In contrast, Hörisch (2015) found that green campaigns on Indiegogo were equally likely to reach their funding goals as other campaigns, but raised smaller amounts. Similarly, Cumming et al.

(2017) observed no significant difference in the success rates of a large sample of green and non-green Indiegogo campaigns from 81 countries. These contrasting findings underscore the need to better understand when and why campaigns' greenness enhances crowdfunding outcomes, and under which conditions it does not. A possible explanation for these divergent findings lies in the institutional context in which campaigns are launched. As it is evident from the Table 1, prior studies have either focused on single-country settings or, when adopting cross-country samples, have largely overlooked institutional heterogeneity. Yet, institutional environments shape both the financing landscape for early-stage ventures and the entrepreneurial capacity to develop and scale green innovations after funding. Hence, variations in environmental regulations and norms, policy schemes, and financial infrastructure may crucially affect the behavior of prospective backers of green crowdfunding campaigns and ultimately their success (Cheng et al., 2025). Recognizing and accounting for differences in the sustainability orientation of institutions is thus essential to advance theory and inform policy on green crowdfunding.

2.2. Sustainability-oriented institutions and the success of green campaigns

We argue that the success of green crowdfunding campaigns depends on the institutional environment in which they are launched. Specifically, the degree to which a country's institutions are oriented toward environmental sustainability influences how prospective backers evaluate the legitimacy, viability, and urgency of green initiatives. Institutions encompass formal rules (laws, regulations, and policies) and informal norms (shared values and cultural expectations) that define acceptable behavior within a society (North, 1990; Scott, 1995). These institutional arrangements shape the entrepreneurial landscape by affecting both the availability of resources and the legitimacy of ventures (Aldrich & Fiol, 1994; Ahlstrom & Bruton, 2002; Zott & Huy, 2007).

In countries where institutions are more environmentally friendly, green ventures are embedded in a supportive ecosystem that promotes the creation and dissemination of sustainability-related knowledge (Fagerberg, 2018; Audretsch, 2023). These ecosystems benefit from environmentally friendly regulations, green standards, and subsidies for green R&D projects and other supporting policy schemes (Veugelers, 2012; Polzin et al., 2015). Empirical research showed that such institutions are positively associated with the emergence and development of green innovations (Demirel & Kesidou, 2011; Kesidou & Demirel, 2012; Aghion et al., 2016; Fabrizi et al., 2018). Prospective backers likely perceive green crowdfunding campaigns launched from these countries as more credible and attractive, due to the innovative knowledge base they can leverage and the institutional legitimacy that surrounds them. This should increase their chances of success.

However, institutional support may also generate unintended detrimental effects on green campaigns. In countries with extensive public and private backing for green initiatives, such as green bonds, VC, and government subsidies, prospective backers may perceive that their individual crowdfunding contributions are less necessary. In other words, strong institutional support may crowd out bottom-up participation, as individuals anticipate that other actors will step in to support worthy projects (Criscuolo & Menon, 2015; Croce et al., 2024). Moreover, in institutional environments with widespread public and private support for green ventures, the most promising initiatives may secure funding from established channels, without resorting to crowdfunding. As a result, crowdfunding may disproportionately attract lower-quality or less investment-ready projects that were unable to obtain financing from those channels. This adverse selection dynamic (Belleflamme et al., 2014) makes it harder for prospective backers to identify truly deserving campaigns, potentially reducing their willingness to contribute.

Taken together, these arguments suggest that the orientation of institutions toward environmental sustainability may have competing effects. On the one hand, it may boost green ventures' perceived legitimacy and viability. On the other hand, it may reduce prospective backers' motivation to engage. The net effect on crowdfunding success is, therefore, theoretically ambiguous and requires an empirical investigation, that is the core of this research brief.

3. Methodology

3.1. Context of the study

We collected data from Kickstarter, the largest reward-based crowdfunding platform. As of August 2025, 281.178 campaigns reached their funding goals, raising $8.9 billion. Like other reward-based platforms, Kickstarter prohibits equity or monetary returns, and instead offers non-monetary rewards. It adopts an all-or-nothing model: funds are transferred only if the campaign meets its target. This feature provides a clear measure of success, making Kickstarter a widely used platform in prior academic research (Mollick et al., 2014; Courtney et al., 2017; Parhankangas & Renko, 2017; McKenny et al., 2024). Its scale and the diversity of institutional contexts represented in its user base make it particularly suitable for our replication study, which focuses on institutional-level differences. We focus on campaigns launched in European countries between 2016 and 2017. This time window aligns with the availability of additional campaign-level data provided by Kickstarter, including the top 10 countries and cities of contributors[2]. Furthermore, in 2016-2017, 65% of all Kickstarter campaigns were based in the U.S.; limiting our main analysis to European countries avoids imbalances in the sample composition. However, we complement the main analysis with robustness checks using U.S.-based campaigns, which we describe in the additional analyses section.

3.2. Identifying green campaigns

Prior studies have often classified green crowdfunding campaigns either using platform-provided labels (Hörisch, 2015) or through manual coding (Calic & Mosakowski, 2016). Both approaches have limitations: manual coding is time-intensive and unscalable, while platform

[2] We use this information in a mediation analysis to assess whether domestic backers drive our findings

labels risk omitting non-obvious green projects, particularly in non-technical categories (Butticè et al., 2019). More recently, some studies have used machine learning approaches to classify campaigns based on their textual descriptions (e.g. Cumming et al., 2017; Barone, 2025). Following this methodology, we built a Random Forest classifier (Breiman, 2001) using a training set of 10,000 campaigns manually labelled by two independent coders according to Lehner's (2013, p. 2) definition of green initiatives, i.e. as those "that have an environmental mission as their primal goal". According to this definition, a campaign about an innovative product that reduces water consumption in agriculture and a campaign to sustain the production of a documentary that raises awareness about climate change are both considered green. The tags assigned by two research assistants were then compared to identify inconsistencies in classification. In such cases, one of the authors manually tagged the campaign descriptions. These cases were then discussed by this author and the research assistants and assigned to one class or another. Intuitively, the random forest algorithm generates a set of independent classification trees built on different subsets of data randomly selected from the training set. The algorithm assigns a class to a campaign outside the training sample by combining the predictions of all classification trees generated based on the principle of majority voting. We provided a detailed description of the classification procedure in Appendix A1. In our study, the algorithm achieved a highly satisfactory classification performance, as explained in the same appendix. An advantage of this classification approach is that it enables scalable and fully replicable identification of green campaigns across large datasets, eliminating subjectivity and ensuring consistency across subsamples (Goh et al., 2020; Divya Venkatesh et al., 2024). The algorithm was applied to classify both the 8,912 campaigns launched in European countries, used in the main analysis, and the 46,756 U.S.-based campaigns included in our additional analyses.

3.3. Variables

Following prior studies on crowdfunding success, our dependent variable is *Success*, coded as 1 if the campaign met or exceeded its funding goal, and 0 otherwise. We used alternative outcomes as robustness checks: total amount raised (*amount_collected*) and number of backers (*backers*). Our key independent variable is *Green*, a dummy identifying campaigns classified as green via the machine learning algorithm described above. To test our moderation hypotheses, we use the Environmental Performance Index (*EPI*) as a proxy for the environmental sustainability orientation of country-level institutions. The EPI ranks 180 countries based on environmental outcomes across multiple areas, including social, technological, and economic dimensions (Thomakos & Alexopoulos, 2016). This index is widely used in both crowdfunding studies (e.g., Butticè et al., 2019) and other fields (e.g., Zou et al., 2022). It provides a reliable aggregate measure of the institutional attention toward sustainability.

We included control variables commonly associated with crowdfunding success and relevant to our framework. To account for the amount and quality of campaign information, we used *ln_visual* (number of images/videos) and *text_length*, as both enhance campaign performance (Yang et al., 2020; Moy et al., 2018). We controlled for *target_capital*, as it has been negatively linked to success (Giudici et al., 2017), and *campaign_duration*, which tends to have a positive association (Saladin et al., 2019). We included *d_disabled_communication*, as campaigns with limited interaction tend to have lower success rates (Clauss et al., 2018) and *d_staff_pick*, indicating endorsement by Kickstarter, shown to increase success likelihood (Kunz et al., 2017). Social capital was captured through *internal social capital*, measured by the number of comments the creator had posted on other campaigns (Butticè et al., 2017). We also controlled for whether the creator had launched successful campaigns in the past (*d_serial*), as previous experience with crowdfunding has been linked to higher success rates

(Sewaid et al., 2021). To account for high-quality green campaigns selection into specialized platforms rather than Kickstarter, we included *green_platform*, measuring the number of country-level platforms focused on green projects. We also added fixed effects for year, category, and country, and included *GDP* to control for national economic size.

To explore the mechanisms underlying our moderation analysis, we introduced in a post-hoc analysis two additional variables. The first is *green_VC_to_GDP*, which captures the level of institutional support for green ventures through the ratio of green VC investments to national GDP. To construct this measure, we used the VICO 5.0 database (e.g., Colombo et al., 2019), which provides longitudinal data on European firms that received VC funding between 1998 and 2018. We focused on firms funded between 2013 and 2015, prior to our crowdfunding observation window, and retrieved their business descriptions from Orbis-Bureau van Dijk. Similar to our method for classifying green campaigns, we identified green VC-backed ventures using a machine learning technique. Results showed that 8.29% of VC-backed ventures in this period were classified as green, representing 8.44% of VC investments (Bianchini & Croce, 2021). We computed *green_VC_to_GDP* by dividing the total green VC investment by the country's GDP, to adjust for differences in economic size and ensure cross-country comparability. Second, we use *ln_green_patents*, the log of the ratio of green patents to GDP (based on OECD taxonomy), as a proxy for a country's green knowledge base. Patent data are drawn from the European Patent Office, covering filings by national applicants between 2013–2015. We identified green patents using the OECD's green innovation taxonomy (Haščič & Migotto, 2015), and we computed the ratio of green patents to GDP to adjust for country size. Due to the skewness of this variable, we applied a logarithmic transformation (*ln_green_patents*) in our analyses.

Table 2 reports descriptive statistics and the correlation matrix for the variables included in our models. Green campaigns represent 31.4% of the total sample. They are associated with higher levels of visual content, greater internal social capital of their proponents, greater target capital, and greater duration. They also exhibit longer text length and are more likely to be launched by serial campaign proponents. Most correlations are low, with a few notable exceptions, such as between *green_platform* and *gdp* and between *internal_social_capital* and both *ln_visual* and *serial*. Overall, the correlation structure suggests limited multicollinearity concerns among regressors. The average VIF is equal to 1.72.

//Table 2 about here//

In Table 3 we report descriptive statistics for the quartile values of EPI. The ratio of green campaigns over the total number of campaigns decreases with higher values of the EPI index. Campaigns' success rates, instead, are lower in countries with a value of the EPI index between the first and second quartile. The table also reports the distribution of crowdfunding campaigns across countries. The five countries with the highest number of campaigns are Germany (1,691), Italy (1,395), France (1,267), Spain (1,125), and the Netherlands (673). Overall these countries account for over 65% of the sample.

//Table 3a and Table 3b about here//

4. Results

4.1. Main model

Table 4 presents the results of our Logit estimates on the determinants of crowdfunding campaign success.

//Table 4 about here//

Model 1, which includes only control variables, suggests that success decreases with campaign duration and target capital ($p<0.001$), while it increases with internal social capital, visual content, text length, and staff pick status ($p<0.001$). Disabling comments ($p<0.001$) and being a serial founder ($p<0.001$) reduce the likelihood of success. Model 2 adds the *green* variable. Holding all other variables constant, green campaigns are significantly less likely to succeed

($p<0.001$), with an average marginal effect (AME) of -7.1 percentage points. This translates into a 34.2% reduction in success probability when moving from a non-green to a green campaign. Model 3 introduces an interaction term between green and the EPI. The interaction is negative and significant ($p<0.001$), indicating that the lower success probability of green campaigns is more pronounced in countries with stronger institutional support for environmental sustainability. As shown in Figure 1, at the 10th percentile of the standardized EPI (-1.0), green campaigns are 3.9 percentage points less likely to succeed; this gap increases to 9.0 percentage points at the 90th percentile (1.7).

//Figure 1 about here//

4.2. Mechanisms behind the moderating role of institution

We now explore the mechanisms underlying the stronger negative association between green campaigns and success in countries with higher institutional sustainability orientation. Specifically, we considered two variables: the stock of green patents (*ln_green_patent*), capturing a country's green innovation capacity, and the ratio of green VC investments to GDP (*green_VC_to_GDP*), capturing the availability of other funding sources for green ventures. Both variables are positively correlated with EPI (0.27 and 0.32, respectively).

//Table 5 about here//

Table 5 reports Logit models replacing EPI with these two variables. Model I shows a positive moderation of *ln_green_patent* on green campaigns' likelihood of success. The negative AME of *green* decreases with a higher number of green patents: from -3.5 percentage points at the 10th percentile (equal to 8.3) to -2.6 points at the 90th percentile (12.3). In Model II, *green_VC_to_GDP* strengthens the negative association between green campaigns and success: the AME of *green* drops from -1.8 points at the 10th percentile (0.021) to -6.7 points at the 90th percentile (0.089). Model III includes both moderators simultaneously; results remain consistent. In Model IV, we reintroduce the EPI interaction, which remains significant but smaller in magnitude, suggesting partial mediation. A KHB decomposition confirms that 10.7% of EPI's moderation is mediated by the two variables. Overall, these results provide empirical support for the dual mechanism proposed in our theoretical framework. A stronger green knowledge base (proxied by green patents) positively moderates the association between green campaigns and success, partially offsetting the general disadvantage of green campaigns. In contrast, the greater availability of alternative green financing sources (proxied by green VC investments) negatively moderates this association. This result suggests that the availability of traditional financing sources for green ventures in countries where institutions are more oriented towards environmental sustainability discourages prospective backers from supporting green crowdfunding campaigns. Our empirical results suggest that this latter mechanism prevails.

4.3. Robustness checks

We run multiple checks to ensure the robustness of our results.

//Table 6 about here//

National institutional factors unrelated to sustainability orientation, such as common versus civil law, may influence the success of green crowdfunding campaigns. To test this, we introduced a robustness check using a dummy variable indicating whether a campaign was located in a common-law country. Given our focus on Europe, this dummy was equal to 1 only in the UK and Ireland, while was set to zero in all the other countries. Results remained consistent with our main findings even after controlling for this variable (model I). One related concern is the choice of focusing on European campaigns. Our sample includes only these campaigns to capture variation in country-level orientation towards environmental sustainability, as measured by the EPI index, which is available at the national level. While this approach excluded U.S.-based campaigns (which constitute the majority of Kickstarter campaigns), this was necessary to avoid potential biases from an unbalanced distribution of

EPI values (i.e., having the majority of observations associated with the same value). To address concerns about the generalizability of our results outside Europe, we conducted an additional analysis that included U.S. campaigns in the sample. Additionally, we analyzed a U.S.-only sample separately, using state-level environmental sustainability data from the U.S. Sustainable Development Report (2021). Specifically, we used a dummy variable indicating if the specific U.S. state was a member of the United States Climate Alliance. This Alliance aggregates states in the U.S. that are committed to upholding the objectives of the 2015 Paris Agreement on climate change and was formed on June 1, 2017 after the withdrawal of the U.S. from the Paris Agreement. These two analyses confirmed our initial findings (model II and III). In addition, we excluded campaigns with target capital below $5,000 to ensure that our results were not driven by very small campaigns (Mollick, 2014). The results remained consistent (model IV). In the same vein, we changed the operationalization of the dependent variable using instead of the dummy *success*, the total amount the focal campaign raised and the total number of investors it attracted. Again, the results are consistent with those of the main estimates (Models V and VI).

To further validate our interpretation of the results regarding the mechanisms driving the negative moderating effect of country-level institutions' orientation towards environmental sustainability on the association between campaigns' greenness and success, we conducted an additional analysis focused on the geographical composition of campaign backers. Domestic prospective backers are allegedly more sensitive to the presence of environmentally friendly institutions in the countries where campaigns are launched than foreign prospective backers. Hence, in these countries, we expect green campaigns to attract a smaller number of domestic backers relative to foreign backers. In turn, the smaller number of domestic backers in these countries hampers the campaigns' success.

//Table 7 about here//

Table 7 examines the relationship between the geographic composition of campaign backers, captured by the variable *domestic_to_international*, and campaign success. Column I shows that campaigns are more likely to be successful if they have a higher share of domestic backers. Moreover, as is apparent from Column II, while *green* is positively associated with the proportion of domestic backers, this association is negatively moderated by the EPI variable. According to our estimates, green campaigns attract more domestic backers than other campaigns only when the EPI value is below 83.24, corresponding to the 14th percentile of the variable distribution. This result supports our argument that in environmentally friendly countries, informed domestic individuals perceive that green projects already benefit from other funding sources, reducing their perceived need to contribute to these projects through crowdfunding. When all variables are included in the success model (Column III), the *domestic_to_international* variable remains a strong predictor of campaign success. The coefficient of *green* is not significant, while the one of the interactive term *green x EPI* is negative and significant. In sum, our findings suggest that while the engagement of domestic backers plays a key role in driving campaign performance, the orientation towards environmental sustainability of country-level institutions crowds out domestic backers' support for green campaigns, making their success less likely.

Our analyses suggest that the environmental orientation of country-level institutions helps explain the mixed findings in prior studies on the success of green crowdfunding campaigns. However, even in countries with weak environmental institutions, green campaigns tend to underperform. This finding may relate to differences in model specification: compared to earlier studies, we include additional controls, especially those reflecting the information disclosed by campaign proponents (see also Cumming et al., 2017). To explore this, we conducted a mediation analysis.

//Table 8 about here//

As shown in Table 8, we first removed information-related controls (video presence and text length). Without these controls, the coefficient for green turns positive but remains statistically insignificant (Model I), in line with past findings (see Table 1). In Models II and III, where video and text length are the dependent variables, we find that green campaigns are more likely to provide such information. In Model IV, reintroducing these controls into the success model makes the green coefficient negative and significant. This suggests that information provision mediates the relationship between greenness and success. We employed the Buis' decomposition method to investigate this mediation further, which is appropriate for logit models. The results confirm that the information variables mediate the association between *success* and *green*. *Green* has a negative significant direct association with the probability of campaign success (p-value<0.000) and a positive significant indirect association mediated by *ln_visual* and *text_lenght* (p-value<0.000). This latter indirect effect ultimately leads to a positive but not significant overall association between *green* and the likelihood of campaign success, which explains the positive and not significant coefficient of *green* when these variables are not included in the model specification.

5. Conclusion

This research brief examined whether reward-based crowdfunding campaigns that promote environmentally sustainable initiatives are more successful than other campaigns, and how the environmental orientation of country-level institutions influences this relationship. Using a dataset of Kickstarter campaigns and a machine learning algorithm to identify green campaigns, our findings revealed that green campaigns are generally less likely to succeed than non-green ones. This negative association is stronger in countries where institutions are more oriented towards environmental sustainability. A deeper analysis reveals that two institutional features play opposing roles in moderating this relationship. On the one hand, a larger national stock of green patents, indicating green innovative knowledge, attenuates the negative association, suggesting that green campaigns launched in knowledge-rich environments are perceived as more credible and viable by prospective backers. On the other hand, the availability of green VC, used as a proxy for traditional sources of financial support for green ventures, intensifies the negative association. This suggests that in contexts where traditional financing options for green projects are available, prospective backers may perceive their personal contributions via crowdfunding as less fundamental, ultimately reducing their engagement. The dominance of this latter, crowding-out mechanism helps explain why the success of green crowdfunding campaigns is lower in countries with stronger environmental institutional support.

We contribute to the green entrepreneurship literature by offering potential explanations for the mixed findings reported in previous studies on the success of green crowdfunding campaigns. Our findings indicate that sustainability-oriented institutions can exert opposing effects on campaign success, reducing backers' perception of individual contribution while increasing the overall legitimacy of the campaigns. These countervailing mechanisms, which primarily act through domestic backers, offer a nuanced perspective on how institutions shape the outcomes of green versus non-green crowdfunding campaigns. The lack of consideration for the moderating effect of country-level institutions' orientation towards environmental sustainability on the association between campaign greenness and success may help explain previous divergent results. Moreover, by explicitly investigating how the main results change when information about the campaign is included in the econometric models, we highlight key sources of omitted variable bias that may have confounded previous results.

Our study also contributes to the literature on institutions and entrepreneurial finance (e.g., Bruton et al., 2005; Nahata et al., 2014; Grilli et al., 2018), by showing that institutional environments typically seen as conducive to green entrepreneurship do not necessarily enhance the effectiveness of all financing channels. In particular, strong institutional support for sustainability may unintentionally reduce prospective backers' inclination to support green campaigns, as they perceive their personal contributions as less fundamental. This lowers campaign success. In doing so, our study uncovers a non-obvious relationship between institutional quality and alternative finance: crowdfunding appears to be more effective when it fills a perceived institutional void. When this void is less relevant, because institutions already provide strong support for environmental goals, the perceived need for bottom-up financial participation weakens. This insight aligns with broader evidence from the literature on community engagement and entrepreneurial activity in institutionally weak settings, which shows that community participation often emerge to compensate for institutional voids and that intermediaries, in our case crowdfunding platforms, can contribute to fill these gaps (e.g., Mair and Marti., 2009; Mair et al., 2012). Crowdfunding, in this sense, may thrive not despite institutional weakness, but, at least partly, because of it. This finding calls for a more nuanced understanding of how institutions shape the functioning of alternative finance markets. Scholars have documented that reward-based crowdfunding helps ventures reach a development stage that makes them attractive to professional investors (Roma et al., 2017; Colombo & Shafi, 2021). Yet, a supportive institutional environment reduces the effectiveness of crowdfunding. This may inadvertently undermine one of the very mechanisms through which green ventures become investment appealing for VC. In this light, institutional support for sustainability, while beneficial in principle, may weaken the early-stage pipeline for green entrepreneurship by diminishing the catalytic role of crowdfunding, potentially creating a misalignment between public intent and private capital mobilization.

This study has some limitations that future research should address. First, the analysis is correlational and does not establish causality between green campaign and success. Future studies could adopt an identification approach based on experimental designs to address this issue. Second, although our dataset is more comprehensive than that of most previous studies, it is limited to reward-based campaigns on Kickstarter. Extending the analysis to other platforms and crowdfunding types (e.g., equity crowdfunding) would enhance generalizability. Third, while our sample includes campaigns from Europe and the U.S., future research could examine contexts with lower institutional support for sustainability to test whether our findings hold more broadly.

Despite these limitations, our findings have important practical implications. Green entrepreneurs, particularly in countries with well-developed institutional ecosystems, should carefully assess whether crowdfunding is the most effective financing option, as prospective backers may be less inclined to support their campaigns in those countries. Platform managers could implement tools to better communicate the importance and additive value of backer participation, such as emphasizing funding gaps, visualizing campaign momentum, or highlighting the unique role of community support, even in supportive policy environments. For policymakers, promoting crowdfunding as a key source of green finance may be particularly impactful in countries with less developed green ecosystems, where backers are more likely to perceive their contributions as essential. In these contexts, crowdfunding can act not only as a funding tool, but also as a mechanism to foster local engagement, awareness, and ownership of sustainability goals, activating entrepreneurial initiatives that might otherwise remain latent. This contributes to a hybrid model of participation, where strong governmental intervention (e.g. Barnett, 2022) is complemented by bottom-up, community, engagement.

References

Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small business economics*, *32*, 15-30.

Adamska-Mieruszewska, J., Zientara, P., Mrzygłód, U., & Fornalska, A. (2025). Motivations for participation in green crowdfunding: Evidence from the UK. *Environment, Development and Sustainability*, *27*(3), 6139-6164.

Aghion, P., Dechezleprêtre, A., Hemous, D., Martin, R., & Van Reenen, J. (2016). Carbon taxes, path dependency, and directed technical change: Evidence from the auto industry. *Journal of Political Economy*, *124*(1), 1-51.

Ahlers, G. K., Cumming, D., Günther, C., & Schweizer, D. (2015). Signaling in equity crowdfunding. *Entrepreneurship Theory and Practice*, *39*(4), 955-980.

Ahlstrom, D., & Bruton, G. D. (2002). An institutional perspective on the role of culture in shaping strategic actions by technology-focused entrepreneurial firms in China. *Entrepreneurship Theory and Practice*, 26(4), 53-68.

Aldrich, H. E., & Fiol, C. M. (1994). Fools rush in? The institutional context of industry creation. *Academy of Management Review*, *19*(4), 645-670.

Allison, T. H., Davis, B. C., Short, J. C., & Webb, J. W. (2015). Crowdfunding in a prosocial microlending environment: Examining the role of intrinsic versus extrinsic cues. *Entrepreneurship Theory and Practice*, 39(1), 53-73.

Andreoni, J. (1990). Impure altruism and donations to public goods: A theory of warm-glow giving. *The economic journal*, *100*(401), 464-477.

Andreoni, J., & Bernheim, B. D. (2009). Social image and the 50–50 norm: A theoretical and experimental analysis of audience effects. *Econometrica*, 77(5), 1607-1636.

Appio, F. P., Leone, D., Platania, F., & Schiavone, F. (2020). Why are rewards not delivered on time in rewards-based crowdfunding campaigns? An empirical exploration. *Technological Forecasting and Social Change*, 157, 120069.

Audretsch, D. B. (2023). Institutions and entrepreneurship. *Eurasian Business Review*, *13*(3), 495-505.

Barbieri, N., Marzucchi, A., & Rizzo, U. (2020). Knowledge sources and impacts on subsequent inventions: Do green technologies differ from non-green ones?. *Research Policy*, 49(2), 103901.

Barnett, M. L. (2022). Stakeholders Shan't save society. *Organization Studies*, *43*(8), 1343-1346.

Barone, S. (2025). Can Sustainability Disclosure Affect Crowdfunding Success?. *Business Strategy and the Environment*.

Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *American Economic Review*, *96*(5), 1652-1678.

Bjørnskov, C., & Foss, N. (2013). How strategic entrepreneurship and the institutional context drive economic growth. *Strategic Entrepreneurship Journal*, *7*(1), 50-69.

Bjørnskov, C., & Foss, N. J. (2016). Institutions, entrepreneurship, and economic growth: what do we know and what do we still need to know?. *Academy of Management Perspectives*, *30*(3), 292-315.

Bianchini, R., & Croce, A. (2022). The role of environmental policies in promoting venture capital investments in cleantech companies. *Review of Corporate Finance,* forthcoming.

Böckel, A., Hörisch, J., & Tenner, I. (2021). A systematic literature review of crowdfunding and sustainability: highlighting what really matters. *Management Review Quarterly*, 71, 433-453.

Bocken, N. M. (2015). Sustainable venture capital–catalyst for sustainable start-up success?. *Journal of Cleaner Production*, 108, 647-658.

Bourcet, C., & Bovari, E. (2020). Exploring citizens' decision to crowdfund renewable energy projects: Quantitative evidence from France. *Energy Economics*, *88*, 104754.

Breen, R., Karlson, K. B., & Holm, A. (2013). Total, direct, and indirect effects in logit and probit models. *Sociological Methods & Research*, 42(2), 164-191.

Breiman, L. (2001). Random forests. *Machine learning*, 45(1), 5-32.

Bruton, G. D., Fried, V. H., & Manigart, S. (2005). Institutional influences on the worldwide expansion of venture capital. *Entrepreneurship theory and practice*, *29*(6), 737-760.

Bürer, M. J., & Wüstenhagen, R. (2009). Which renewable energy policy is a venture capitalist's best friend? Empirical evidence from a survey of international cleantech investors. *Energy Policy*, 37(12), 4997-5006.

Butticè, V., Colombo M.G., Fumagalli, E., Orsenigo, C. (2019) Green-oriented Crowdfunding Campaigns: Their Characteristics and Diffusion in Different Institutional Settings. *Technology Forecasting and Social Change*, 141, 85-97.

Butticè, V., Colombo, M. G., & Wright, M. (2017). Serial crowdfunding, social capital, and project success. *Entrepreneurship Theory and Practice*, 41(2), 183-207.

Calic, G., & Mosakowski, E. (2016). Kicking off social entrepreneurship: How a sustainability orientation influences crowdfunding success. *Journal of Management Studies*, 53(5), 738-767.

Chen, H., Gompers, P., Kovner, A., & Lerner, J. (2010). Buy local? The geography of venture capital. *Journal of Urban Economics*, 67(1), 90-102.

Cheng, S., Hua, X., Peng, J., & Zhang, H. Climate policy shocks and crowdfunding success of renewable technology campaigns. *European Financial Management*.

Cojoianu, T. F., Clark, G. L., Hoepner, A. G., Veneri, P., & Wójcik, D. (2020). Entrepreneurs for a low carbon world: How environmental knowledge and policy shape the creation and financing of green start-ups. *Research Policy*, 49(6), 103988.

Colombo, M. G., D'Adda, D., & Quas, A. (2019). The geography of venture capital and entrepreneurial ventures' demand for external equity. *Research Policy*, 48(5), 1150-1170.

Colombo, M. G., Franzoni, C., & Rossi-Lamastra, C. (2015). Internal social capital and the attraction of early contributions in crowdfunding. *Entrepreneurship Theory and Practice*, 39(1), 75-100.

Colombo, M. G., Shai, K. (2021). Receiving external equity following successfully crowdfunded technological projects: an informational mechanism. *Small Business Economics* 56 (4), 1507-1529

Corsini, F., & Frey, M. (2023). Exploring the development of environmentally sustainable products through reward-based crowdfunding. *Electronic Commerce Research*, *23*(2), 1183-1207.

Corsini, F., Appio, F. P., & Frey, M. (2024). Green crowdfunding: An empirical study of success factors. *IEEE Transactions on Engineering Management*, *71*, 7654-7668.

Criscuolo, C., & Menon, C. (2015). Environmental policies and risk finance in the green sector: Cross-country evidence. *Energy Policy*, 83, 38-56.

Croce, A., Toschi, L., Ughetto, E. Zanni, S. (2024). Cleantech and policy framework in Europe: A machine learning approach. *Energy Policy*, 114006.

Cumming, D. J., Leboeuf, G., & Schwienbacher, A. (2017). Crowdfunding cleantech. *Energy Economics*, 65, 292-303.

Cumming, D., & Dai, N. (2010). Local bias in venture capital investments. *Journal of Empirical Finance*, 17(3), 362-380.

Dana, J., Weber, R. A., & Kuang, J. X. (2007). Exploiting moral wiggle room: experiments demonstrating an illusory preference for fairness. *Economic Theory*, 33, 67-80.

Dean, T. J., & McMullen, J. S. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing*, 22(1), 50-76.

Demirel, P., & Parris, S. (2015). Access to finance for innovators in the UK's environmental sector. *Technology Analysis & Strategic Management*, 27(7), 782-808.

de Kwaadsteniet, E. W., van Dijk, E., Wit, A., De Cremer, D., & de Rooij, M. (2007). Justifying decisions in social dilemmas: Justification pressures and tacit coordination under environmental uncertainty. *Personality and Social Psychology Bulletin*, *33*(12), 1648-1660.

Divya Venkatesh, J., Jaiswal, A., & Nanda, G. (2024). Comparing human text classification performance and explainability with large language and machine learning models using eye-tracking. *Scientific reports*, *14*(1), 14295.

Dhayal, K. S., Giri, A. K., Esposito, L., & Agarwal, S. (2023). Venture capital investments as the catalyst for sustainable development: Evidence, current status, and future research agenda. *Journal of Cleaner Production*, 136489.

El Bougrini-Mokrani, I., Erragragui, E., & Ureche-Rangau, L. (2025). Leveraging on ESG engagement in reward-based crowdfunding campaigns: a winning bet?. *The Journal of Risk Finance*.

Dong, W., Li, Y., Lv, X., & Yu, C. (2021). How does venture capital spur the innovation of environmentally friendly firms? Evidence from China. *Energy Economics*, 103, 105582.

Fabrizi, A., Guarini, G., & Meliciani, V. (2018). Green patents, regulatory policies and research network policies. *Research Policy*, 47(6), 1018-1031.

Fagerberg, J. (2018). Mobilizing innovation for sustainability transitions: A comment on transformative innovation policy. *Research Policy*, 47(9), 1568-1576.

Gaddy, B. E., Sivaram, V., Jones, T. B., & Wayman, L. (2017). Venture capital and cleantech: The wrong model for energy innovation. *Energy Policy*, 102, 385-395.

Gallagher, K. S., & Muehlegger, E. (2011). Giving green to get green? Incentives and consumer adoption of hybrid vehicle technology. *Journal of Environmental Economics and Management*, 61(1), 1-15.

Gerber, E. M., Hui, J. S., & Kuo, P. Y. (2012, February). Crowdfunding: Why people are motivated to post and fund projects on crowdfunding platforms. In *Proceedings of the International Workshop on Design, Influence, and Social Technologies: Techniques, Impacts and Ethics* (Vol. 2, No. 11). New York, NY: ACM.

Goh, Y. C., Cai, X. Q., Theseira, W., Ko, G., & Khor, K. A. (2020). Evaluating human versus machine learning performance in classifying research abstracts. *Scientometrics*, *125*(2), 1197-1212.

Ghosh, S., & Nanda, R. (2010). Venture capital investment in the clean energy sector. *Harvard Business School Entrepreneurial Management Working Paper*, (11-020).

Grilli, L., Mrkajic, B., & Latifi, G. (2018). Venture capital in Europe: social capital, formal institutions and mediation effects. *Small Business Economics*, 51, 393-410.

Hargadon, A. B., & Kenney, M. (2012). Misguided policy? Following venture capital into clean technology. *California Management Review*, 54(2), 118-139.

Haščič, I., & Migotto, M. (2015). Measuring environmental innovation using patent data. OECD

Hörisch, J. (2015). Crowdfunding for environmental ventures: an empirical analysis of the influence of environmental orientation on the success of crowdfunding initiatives. *Journal of Cleaner Production*, 107, 636-645.

Howard-Greenville, J., Buckle, S.J., Hoskins, B.J., George, G. (2014) Climate change and management. *Academy of Management Journal*. 57(3), 615–623

Kesidou, E., & Demirel, P. (2012). On the drivers of eco-innovations: Empirical evidence from the UK. *Research Policy*, *41*(5), 862-870.

King, G., & Zeng, L. (2001). Logistic regression in rare events data. *Political analysis*, 9(2), 137-163.

Kubo, T., Veríssimo, D., Uryu, S., Mieno, T., & MacMillan, D. (2021). What determines the success and failure of environmental crowdfunding?. *Ambio*, *50*(9), 1659-1669.

Kunz, M. M., Bretschneider, U., Erler, M., & Leimeister, J. M. (2017). An empirical investigation of signaling in reward-based crowdfunding. *Electronic Commerce Research*, 17, 425-461.

Lehner, O. M. (2013). Crowdfunding social ventures: a model and research agenda. *Venture Capital*, 15(4), 289-311.

Mair, J., & Marti, I. (2009). Entrepreneurship in and around institutional voids: A case study from Bangladesh. *Journal of business venturing*, *24*(5), 419-435.

Mair, J., Marti, I., & Ventresca, M. J. (2012). Building inclusive markets in rural Bangladesh: How intermediaries work institutional voids. *Academy of Management journal*, *55*(4), 819-850.

Mazzucato, M. (2015). The green entrepreneurial state. *The politics of green transformations*, 28, 9781315747378-9.

Maiti, M. (2022). Does development in venture capital investments influence green growth?. *Technological Forecasting and Social Change*, 182, 121878.

Meek, W. R., Pacheco, D. F., & York, J. G. (2010). The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context. *Journal of Business Venturing*, 25(5), 493-509.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, *83*(2), 340-363.

Migendt, M., Polzin, F., Schock, F., Täube, F. A., & Von Flotow, P. (2017). Beyond venture capital: an exploratory study of the finance-innovation-policy nexus in cleantech. *Industrial and Corporate Change*, 26(6), 973-996.

Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29(1), 1-16.

Moore, B., & Wüstenhagen, R. (2004). Innovative and sustainable energy technologies: the role of venture capital. *Business Strategy and the Environment*, 13(4), 235-245.

Moy N., Chan H. F., Torgler B. (2018). How much is too much? The effects of information quantity on crowdfunding performance. *PloS One*, 13(3), 1-15.

Mrkajic, B., Murtinu, S., & Scalera, V. G. (2019). Is green the new gold? Venture capital and green entrepreneurship. *Small Business Economics*, 52(4), 929-950.

Muehlegger, E., & Rapson, D. S. (2022). Subsidizing low-and middle-income adoption of electric vehicles: Quasi-experimental evidence from California. *Journal of Public Economics*, *216*, 104752.

Nahata, R., Hazarika, S., & Tandon, K. (2014). Success in global venture capital investing: Do institutional and cultural differences matter?. *Journal of Financial and Quantitative Analysis*, *49*(4), 1039-1070.

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge university press.

North, D. C. (1993). Institutions and credible commitment. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, 11-23.

O'Reilly, S., Mac an Bhaird, C., & Greene, F. J. (2025). The role of equity capital in speeding cleantechs across the 'Valley of Death'. *International Small Business Journal*, *43*(1), 3-29.

Panda, T. K., Kumar, A., Jakhar, S., Luthra, S., Garza-Reyes, J. A., Kazancoglu, I., & Nayak, S. S. (2020). Social and environmental sustainability model on consumers' altruism, green purchase intention, green brand loyalty and evangelism. *Journal of Cleaner Production*, 243, 118575.

Petkova, A. P., Wadhwa, A., Yao, X., & Jain, S. (2014). Reputation and decision making under ambiguity: a study of US venture capital firms' investments in the emerging clean energy sector. *Academy of Management Journal*, 57(2), 422-448.

Polzin, F., Migendt, M., Täube, F. A., & von Flotow, P. (2015). Public policy influence on renewable energy investments—A panel data study across OECD countries. *Energy policy*, *80*, 98-111.

Roma, P., Messeni Petruzzelli, A., & Perrone, G. (2017). From the crowd to the market: The role of reward-based crowdfunding performance in attracting professional investors. *Research Policy* 46 (9), 1606-1628

Roma, P., Vasi, M., Testa, S., & Perrone, G. (2023). Environmental Sustainability Orientation, Reward-Based Crowdfunding, and Venture Capital: The Mediating Role of Crowdfunding Performance for New Technology Ventures. *IEEE Trans. Engineering Management*, *70*(9), 3198-3212.

Rossolini, M., Pedrazzoli, A., & Ronconi, A. (2021). Greening crowdfunding campaigns: an investigation of message framing and effective communication strategies for funding success. *International Journal of Bank Marketing*, *39*(7), 1395-1419.

Scott, W. R. (2005). *Institutions and organizations: Ideas, interests, and identities*. *Sage publications*.

Shao, J., & Ünal, E. (2019). What do consumers value more in green purchasing? Assessing the sustainability practices from demand side of business. *Journal of Cleaner Production*, 209, 1473-1483.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, 13, 290-312.

Sorenson, O., & Stuart, T. E. (2001). Syndication networks and the spatial distribution of venture capital investments. *American Journal of Sociology*, 106(6), 1546-1588.

Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2010). Mismeasuring our lives: Why GDP doesn't add up. *The New Press*.

Tang, X., Yao, X., Dai, R., & Wang, Q. (2024). Does green matter for crowdfunding? International evidence. *Journal of International Financial Markets, Institutions and Money*, *92*, 101950.

Thomakos, D. D., & Alexopoulos, T. A. (2016). Carbon intensity as a proxy for environmental performance and the informational content of the EPI. *Energy Policy*, 94, 179-190.

Vasileiadou, E., Huijben, J. C., & Raven, R. P. J. M. (2016). Three is a crowd? Exploring the potential of crowdfunding for renewable energy in the Netherlands. *Journal of Cleaner Production*, 128, 142-155.

Veugelers, R. (2012). Which policy instruments to induce clean innovating?. *Research Policy*, *41*(10), 1770-1778.

Vismara, S. (2019). Sustainability in equity crowdfunding. *Technological Forecasting and Social Change*, 141, 98-106.

Wehnert, P., & Beckmann, M. (2021). Crowdfunding for a sustainable future: A systematic literature review. *IEEE Transactions on Engineering Management*, *70*(9), 3100-3115.

Wustenhagen, R., & Teppo, T. (2006). Do venture capitalists really invest in good industries? Risk-return perceptions and path dependence in the emerging European energy VC market. *International Journal of Technology Management*, *34*(1-2), 63-87.

Yang, J., Li, Y., Calic, G., & Shevchenko, A. (2020). How multimedia shape crowdfunding outcomes: The overshadowing effect of images and videos on text in campaign information. *Journal of Business Research*, 117, 6-18.

Yao, X. (2025). The green premium in sustainable fintech: Cross-country evidence from crowdfunding. *Finance Research Letters*, *77*, 107131.

Zelner, B. A. (2009). Using simulation to interpret results from logit, probit, and other nonlinear models. *Strategic Management Journal*, 30(12), 1335-1348.

Zott, C., & Huy, Q. N. (2007). How entrepreneurs use symbolic management to acquire resources. *Administrative Science Quarterly*, *52*(1), 70-105.

Zou, C., Zhu, J., Lou, K., & Yang, L. (2022). Coupling coordination and spatiotemporal heterogeneity between urbanization and ecological environment in Shaanxi Province, China. *Ecological Indicators*, 141, 10915

TABLES

Table 1 – Empirical literature on green crowdfunding and success

Study	Operationalization of Green Campaigns	Platform	Sample Size & Geography	Time Period	Main Findings
Adamska-Mieruszewska et al. (2023)	Survey-based: pro-environmental intention as proxy for green crowdfunding support	Not campaign-based (UK survey)	302 individuals (UK)	2022	Intention to support green campaigns influenced by willingness to save the planet, warm-glow, green trust, and willingness to sacrifice
Barone (2025)	Sustainability disclosure via machine learning	Kickstarter	1,838 campaigns (Europe)	2015–2024	Sustainability disclosure increases funds raised (+70.4%) and success probability (+10%)
Bourcet & Bovari (2020)	Self-identification with renewable energy (RE) sector	Not campaign-based (FR survey)	2,968 individuals (France)	2019	RE crowdfunding intention driven by trust, prior RE experience, and attitude toward RE
Calic & Mosakowski (2016)	Manual coding of sustainability orientation (environmental + social)	Kickstarter	Random sample of tech/film campaigns (global)	2009–2013	Sustainability orientation increases success, especially when combined with creativity and external endorsement
Cumming et al. (2017)	Keyword filtering (e.g. green energy, cleantech)	Indiegogo	47,139 campaigns (global)	2011-2013	Green crowdfunding campaigns are as successful as non-green campaigns.
Cheng et al. (2025)	NLP-based classification of environmental terms (Word2Vec & ESG lexicon)	Kickstarter	24,748 campaigns (global)	2009–2023	Climate policy shocks (e.g. Paris withdrawal) reduce green campaign success; effects mediated by trust and availability bias
Corsini & Frey (2024)	Keyword filtering (e.g. sustainable, biodegradable) + survey validation	Kickstarter & Indiegogo	113 green product campaigns (global)	2009–2020	Crowdfunding less effective for radical green innovation
Corsini et al. (2024)	Keyword filtering (e.g. sustainable, biodegradable) + survey validation	Kickstarter & Indiegogo	113 green product campaigns (global)	2009–2020	Green product codesign and market insight improve success; legitimacy has no effect; development stage weakens codesign effect

El Bougrini-Mokrani et al. (2025)	Keyword filtering	Ulule	27,213 (France)	2012–2018	ESG discourse positively affects success; effect is strongest for corporate sponsors vs. individuals/NGOs; platforms should highlight ESG to reduce information asymmetries
Hörisch (2015)	Categorization into “green” vs. “non-green” using platform data + manual verification	Indiegogo	583 campaigns (Europe)	June 2014	No significant effect of environmental orientation; Initial evidence on a possible negative association with success
Kubo et al. (2021)	Categorization into “green” vs. “non-green” using platform data + textual analysis	Readyfor	473 campaigns (Japan)	2013–2019	Green campaigns underperform vs. other category (e.g. pet-related ones)
Roma et al. (2023)	Expert evaluation of sustainability orientation from campaign descriptions	Kickstarter	662 campaigns (global)	2009–2014	Environmental orientation negatively impacts crowdfunding success
Rossolini et al. (2021)	Manual coding of green emphasis in Indiegogo text content ("Community–Environment")	Indiegogo	86 campaigns (global)	2015–2020	Green emphasis and quantitative targets positively affect campaign success
Tang et al. (2024)	Categorization into “green” vs. “non-green” using platform data	Indiegogo	13,525 campaigns (global)	2010–2022	Green campaigns more successful, especially post-COVID and in developing countries
Yao (2025)	Categorization into “green” vs. “non-green” using platform data	Indiegogo	13,458 projects (global)	2008–2022	Green campaigns raise more funds and receive higher per-backer contributions

Table 2- Correlation matrix

	Mean	St. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13
1.success	0.302	0.459	1												
2.green	0.314	0.464	0.187*	1											
3.green_platform	6.841	7.488	-0.010	0.017	1										
4.internal_social_capital	0.916	1.544	0.507*	0.370*	0.025	1									
5.ln_target	8.952	1.759	-0.208*	0.273*	0.047*	0.042*	1								
6.ln_visual	2.186	1.120	0.426*	0.575*	0.025	0.546*	0.171*	1							
7.staff_pick	0.090	0.286	0.305*	0.226*	0.054*	0.268*	0.113*	0.290*	1						
8.gdp	149.1	102.4	-0.034*	-0.010	0.853*	-0.008	0.037*	0.032*	0.025	1					
9.duration	77.79	90.43	0.019	0.192*	0.027	0.112*	0.162*	0.195*	0.077*	-0.000	1				
10.serial	0.162	0.369	0.150*	0.063*	-0.016	0.388*	-0.140*	0.176*	0.019	-0.027	-0.073*	1			
11.text_lenght	113.8	25.23	0.040*	0.048*	0.000	0.038*	0.038*	0.019	0.031*	-0.002	-0.004	-0.006	1		
12.disabled_comments	0.004	0.063	-0.022	-0.008	0.010	-0.008	0.010	-0.009	-0.020	0.008	-0.018	-0.013	-0.003	1	
13.EPI	85.81	3.092	0.031*	-0.032*	-0.288*	-0.017*	-0.060*	0.010*	-0.026*	-0.081*	-0.038*	-0.017*	0.013*	-0.012*	1

n. obs=8.912, "*"denotes correlation significant at 99%

Table 3a- Descriptive statistics by Environmental Performance Index (EPI) quartiles

EPI	GDP	Population	Crowdfunding success rate	Total crowdfunding pledged	n. of green campaigns on total n. of campaigns	Countries
< Q1	1,993,706	5.26 e+07	0.308	79,807,619	0.120	BE, BG, CY, NL, NO, PL, RO
>= Q1 & < Q2	1,644,299	5.90 e+07	0.208	8,719,194	0.115	DE, IT
>=Q2 & < Q3	1,420,356	4.02 e+07	0.339	38,359,226	0.111	AT, CH, CZ, HU, IE, LT, LU, LV, SK
>Q3	762,847	2.80 e+07	0.317	22,417,931	0.096	DK, ES, FI, FR, IS, PT, SE
Total	1,490,581	4.45 e+07	0.302	149,303,971	0.111	

Table 3b- Country breakdown

Country	# campaigns
DE	1,691
IT	1,395
FR	1,267
ES	1,125
NL	673
SE	622
CH	372
DK	371
IE	282
BE	264
AT	252
NO	248
PL	87
HU	47
CZ	35
RO	29
LT	24
LU	22
BG	21
FI	21
LV	17
PT	17
IS	15
SK	10
CY	5
Total	8,912

Table 4. Main model

	I	II	III
green		-0.219***	-0.516***
		(0.02)	(0.09)
EPI			0.093*
			(0.06)
green x EPI			-0.114***
			(0.02)
green_platform	0.006	0.021*	0.030*
	(0.01)	(0.01)	(0.02)
text_lenght	0.003***	0.003***	0.003***
	(0.00)	(0.00)	(0.00)
d_serial	-0.939***	-0.951***	-0.952***
	(0.02)	(0.02)	(0.02)
GDP	-0.067	-0.059	-0.295**
	(0.11)	(0.10)	(0.12)
internal_social_capital	1.020***	0.826***	0.832***
	(0.02)	(0.01)	(0.01)
ln_target	-0.381***	-0.724***	-0.721***
	(0.00)	(0.00)	(0.00)
duration	-0.001***	-0.001***	-0.001***
	(0.00)	(0.00)	(0.00)
disabled_comunication	-1.045***	-0.806***	-0.797***
	(0.10)	(0.06)	(0.11)
ln_visual	1.328***	1.366***	1.372***
	(0.00)	(0.00)	(0.01)
staff_pick	1.618***	1.637***	1.651***
	(0.02)	(0.02)	(0.02)
Constant	3.120***	3.096***	3.022***
	(0.25)	(0.26)	(0.26)
Observations	8,912	8,912	8,912
Log pseudolikelihood	-3065.065	-3061.837	-3049.689

Logit models with clustered standard errors at the geographical level. The dependent variable is a dummy variable, success, that takes a value of 1 if the crowdfunding campaign was successful, and 0 otherwise. Category, year, and country dummies are included in the estimates (coefficients are omitted in the Table). In Column I, we included the control variables only. In Column II, we added the independent variable green. In Column III we include the interaction between green and EPI. Standard errors in round brackets. *, **, and *** indicate significance levels at 0.10, 0.05 and 0.01, respectively.

Table 5. The mechanisms beneath the moderation between EPI and green

	I	II	III	IV
green	-1.062***	-0.337*	-1.110***	-1.105***
	(0.29)	(0.18)	(0.19)	(0.21)
ln_green_patent	0.220***		0.088***	0.099***
	(0.05)		(0.01)	(0.01)
green x ln_green_patent	0.047***		0.075***	0.073***
	(0.02)		(0.01)	(0.02)
green_VC_to_GDP		6.882***	6.141***	6.536***
		(1.63)	(1.59)	(1.34)
green x green_VC_to_GDP		-3.931**	-4.391***	-3.870**
		(1.72)	(1.74)	(1.91)
EPI				-0.035
				(0.03)
green x EPI				-0.073***
				(0.02)
Controls as in the main model	Yes	Yes	Yes	Yes
Constant	1.109*	2.694***	1.695***	1.845***
	(0.65)	(0.30)	(0.34)	(0.27)
Observations	8,912	8,912	8,912	8,912
Log pseudolikelihood	-3044.527	-3034.606	-3033.121	-3032.377

Logit models with clustered standard errors at the geographical level. The dependent variable is a dummy variable, *success*, that takes a value of 1 if the crowdfunding campaign was successful, and 0 otherwise. Category, year, and country dummies are included in the estimates (these coefficients are omitted in the Table). In Column I, we included the variables *ln_green_patent* and the moderation of this variable with *green.* In Column II, we included the variables green*_VC_to_GDP* and the moderation of this variable with *green.* In Column III, we included both these variables and their moderations. In Column IV, we added he variable *EPI* and the interactions between *green* and *EPI.* Thus, Column IV, reports the full model. Standard errors in round brackets. *, **, and *** indicate significance levels at 0.10, 0.05 and 0.01, respectively.

Table 6. Robustness Checks

	I	II	III	IV	V	VI
green	-0.456***	-0.434***	-0.350***	-0.355***	-0.118***	-0.055***
	(0.09)	(0.03)	(0.03)	(0.12)	(0.03)	(0.02)
EPI	0.114***	0.124***		0.177***	0.045***	0.129***
	(0.06)	(0.01)		(0.05)	(0.01)	(0.01)
green X EPI	-0.156***	-0.164***		-0.114***	-0.044***	-0.083***
	(0.02)	(0.02)		(0.02)	(0.02)	(0.02)
Civil Law Country	0.478***					
	(0.02)					
Climate Alliance			0.002***			
			(0.00)			
green x Climate Alliance			-0.001***			
			(0.00)			
Controls as in the main model	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.120***	2.813***	2.557***	6.393***	0.603***	2.079***
	(0.25)	(0.06)	(0.07)	(0.22)	(0.09)	(0.06)
Observations	8,912	55,196	46,756	5,760	8,912	8,912
Log pseudolikelihood	-3108.759	-20142.158	-16627.925	-1525.9465	-118491.54	-162501.22

Logit models with clustered standard errors at the geographical level. The dependent variable is a dummy variable, success, that takes a value of 1 if the crowdfunding campaign was successful, and 0 otherwise. In Column I, we included the control variable civil law. In Column II, we added US-based crowdfunding campaigns to the sample, this regression does not include the control on green platforms, which is available only for sample used in the main model. In Column III we limited the analysis to US based crowdfunding campaigns. Column IV reports the results on a restricted sample (target capital >5000$). Column V and VI report the result with the logarithm of the number of backers and capital collected as dependent variables respectively. Standard errors in round brackets. *, **, and *** indicate significance levels at 0.10, 0.05 and 0.01, respectively.

Table 7. Green campaigns and country sustainability orientation: The mediation of local backers

	I	II	III
Dependent variable	**success**	**local_to_international**	**success**
Local_to_international	0.332***		0.333***
	(0.03)		(0.01)
green		0.193***	0.164
		(0.03)	(0.11)
EPI		0. 097***	0.038
		(0.02)	(0.04)
Green x EPI		-0.087***	-0.059**
		(0.01)	(0.02)
Controls as in the main model	Yes	Yes	Yes
Constant	4.225***	0.234	4.244***
	(0.24)	(0.28)	(0.21)
Observations	7,784	7,784	7,784
Log pseudolikelihood	-3079.961	- 7592.597	-3078.471

Estimates reported in Column I and III were derived from Logit models with clustered standard errors at the geographical level. The dependent variable is a dummy variable, *success*, that takes a value of 1 if the crowdfunding campaign was successful, and 0 otherwise. Estimates reported in Column II were derived from Tobit models, with lower bound for the dependent variable equal to 0, and with clustered standard errors at the geographical level. The dependent variable is *domestic_to_international*, i.e., the ratio between local and international backers. Standard errors in round brackets. *, **, and *** indicate significance levels at 0.10, 0.05 and 0.01, respectively.

Table 8. Panel a. Mediation of information

	I	II	III	IV
green	0.119	0.700***	3.599**	-0.219***
	(0.11)	(0.03)	(0.48)	(0.02)
ln_visual				1.366***
				(0.00)
text_lenght				0.003***
				(0.00)
Controls as in the main model	Yes	Yes	Yes	Yes
Constant	3.120***	1.012***	116.3***	6.393***
	(0.25)	(0.06)	(2.05)	(0.22)
Observations	8,912	8,912	8,912	8,912
Log pseudolikelihood /R^2	-3544.007	0.4652	0.0130	-3061.837

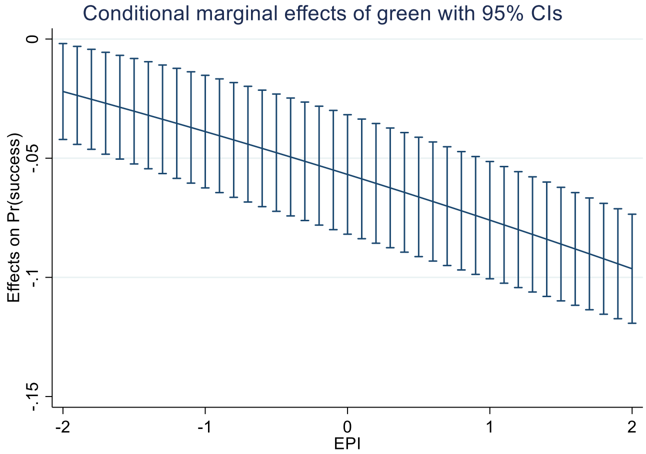
Logit models with clustered standard errors at the geographical level. The dependent variable is a dummy variable, success, that takes a value of 1 if the crowdfunding campaign was successful, and 0 otherwise. In Column I, we excluded the control variable text_lenght and ln_visual. In Column II, we run a regression where the dependent variable is ln_visual. In Column III, we run a regression where the dependent variable is text_lenght. Column IV reports the results where the dependent variable is the success and the mediation variables are included in the estimate. Standard errors in round brackets. *, **, and *** indicate significance levels at 0.10, 0.05 and 0.01, respectively.

Table 8. Panel b. Mediation of information. Decomposition of the effects

	Observed coefficient	Bootstrap standard error	P-value
Total effect	0.7914	0.027	0.000
Indirect effect	1.4005	0.016	0.000
Direct effect	-0.6090	0.025	0.000

Buis (2010) decomposition method. Indirect effect= $\ln(Odds_{ij}/Odds_{jj})$. Direct effect= $\ln(Odds_{ii}/Odds_{ij})$

Figure 1. Moderation of EPI on the association between crowdfunding campaigns' greenness and their likelihood of success



Appendix A1. Text-based classification of green campaigns

Building on the approach proposed in Butticè et al. (2019), this paper leverages machine learning in the form of a text-based classification algorithm to distinguish between green and non-green campaigns. This approach offers several advantages compared to alternative strategies. From one side, by learning patterns from the textual description of green and non-green initiatives, it adapts over time as language and campaign narratives evolve, offering a dynamically adaptive classification that improves as new data become available. This aspect makes it preferable to strategies based on a fixed set of manually curated keywords (Cumming et al, 2017). From the other, once trained the machine learning model applies the same decision logic consistently across all the campaigns, ensuring objectivity and uniformity in classification. This overcomes the limitations of assessments based on human judgment (Calic & Mosakowski, 2016) that, while being potentially insightful, lack scalability and can be affected by inconsistencies and personal biases.

To develop the classification model, we compiled a dataset of examples consisting of the textual description of 10,000 campaigns. Each document was manually labeled as either "green" or "non-green", and standard natural language processing techniques were applied, including the removal of punctuation and numbers, conversion of all terms to lowercase, and elimination of stop words. The latter was intended to discard common English terms that, while frequent, carry little value for text classification tasks. Subsequently, documents were converted into a numerical format suitable for machine learning processing. This was achieved by resorting to the widely adopted bag-of-words approach (Sebastiani, 2002), which involves constructing a vocabulary of unique terms from the entire corpus of texts and representing each document as a numeric vector based on the frequency of each word within it. A last filter was applied to remove the terms occurring in less than five descriptions.

The process outlined above produced a final dataset of 10,000 labeled examples (texts) and 1370 features (words), on which the Random Forest algorithm was applied. Random Forest is a powerful extension of decision trees (Breiman et al., 1984) which offers enhanced predictive performance through ensemble learning. It generates multiple decision trees (forest) on random subsets of examples and features. Each tree makes a classification, and the final output is determined by majority voting. This approach reduces overfitting and improves accuracy and robustness compared to individual decision trees. The algorithm is governed, among others, by three key hyperparameters: the number of trees in the forest (n_estimators), the number of features to consider for selecting the best split at each node (max_features), and the maximum depth of each tree. Through fine-tuning, we found that by setting n_estimators = 100, max_features = $\sqrt{n}$ (where n is the total number of features, or words, in the dataset), and letting the trees grow to their maximum depth resulted in an out-of-bag error estimate of 7%, which corresponds to a highly satisfactory estimated accuracy of 93%. Based on these results, we proceeded to train the final model using this configuration and employed it to classify the remaining campaigns as either green or non-green initiatives.