Nudges on Environmental Engagement: Evidence from Crowdfunding

John (Jianqiu) Bai, Yi Cao, Xiumin Martin, Chi Wan *

Abstract

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Keywords: crowdfunding, ESG, sustainability
JEL: Q20, Q40, Q50, G30, H23

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Abstract

We study a platform policy of offering entrepreneurs an option to disclose environmental engagement (E-Commitment) using Kickstarter as a laboratory. After the policy rollout, 32.5% of entrepreneurs took up the disclosure option and their projects tend to attract out-of-state backers. Using the rollout as an instrumental variable for E-Commitment that addresses the endogenous nature of the variable, we find that the disclosure leads to 13.2% higher likelihood of funding success and 8.7% higher funding amount. We also observe a significant increase in the number of environmental conscious backers, new backers, and environmental related comments among these projects with disclosure of environmental engagement. Finally, we find little change in the likelihood of product delivery, but the minimum funding costs rise by 53.8% and the time from funding completion to product delivery stretches longer by 51%. Collectively, the evidence suggests: (1) Kickstarter's nudge for environmental engagement enhances creators' ability to attract environmental conscious, new backers; and (2) the environmental conscious backers' funding decision is likely driven by non-financial, taste-based environmental motive.

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Introduction

In recent years, the landscape of shareholder priorities has notably shifted towards heightened concern for climate risk and broader Environmental, Social, and Governance (ESG) engagements. According to data from the US Sustainable Investment Forum (SIF), there were $8.4 trillion in total US sustainable investment assets under management at the beginning of 2022.[1] This trend, along with increased scrutiny from financial regulators, underscores escalating apprehension about climate risks. However, many fundamental questions regarding ESG remain unanswered. For instance, whether the demand originates from shareholders, their representatives such as asset managers, or consumers is still unclear. Furthermore, is it pecuniary, tangible or non-pecuniary, intangible incentive that drives this phenomenon?[2] In this study, we aim to shed light on these issues by studying the rollout of an environmental engagement policy (henceforth the policy) on a reward-based crowdfunding platform, Kickstarter.

Kickstarter is one of the most prominent reward-based crowdfunding platforms that aim to support the realization of creative projects. Launched in April 2009, Kickstarter has enabled the backing of 223,300 diverse projects in fifteen distinct categories including films, music, comics, food, crafts, and others. As of July 2021, over 20 million backers have pledged over $6 billion for projects on Kickstarter, and they are incentivized by tangible rewards offered by project creators. To protect backers' financial interest, Kickstarter stipulates, if a project's funding falls short of the predetermined goal, creators are expected to refund all the money raised to the backers. Kickstarter offers an ideal setting to study the motives for sustainable investment for two reasons. First, prior research and anecdotal evidence suggest that both

[1] https://www.ussif.org/blog_home.asp?Display=194#:~:text=WASHINGTON%2C%20D.C.%2C%20December%2013%2C,at%20the%20beginning%20of%202022.

[2] Throughout the study, the terms "tangible", "pecuniary", and "financial" are used interchangeably to refer to motives or incentives that are related to monetary benefits such as rewards. Similarly, the terms "intangible", "non-pecuniary", and "non-financial" are interchangeable to refer to motives or incentives that are unrelated to monetary benefits such as environmental concerns.

financial and pro-social motives drive backers to support a Kickstarter project (Agrawal et al. 2014, Freedman and Jin 2011, Dai and Zhang 2015). Second, the introduction of the category-level E-Policy in 2018, allowing creators to discuss environmental engagement (E-Commitment) in a separate section of the funding campaign page, presents a unique opportunity to closely examine the demand for environmental engagement and explore the underlying motivations behind the choices made by creators.[3] This is because, after the policy, we can directly observe which creators choose to take up environment commitment and thus assess its potential influence on backers. By analyzing this micro-level, detailed data combined with the unique policy shock, researchers can gain insights into the factors that drive individuals to prioritize environmental engagement.

We begin our analyses by examining the impact of the policy rollouts on funding outcomes using the data from Kickstarter between 2016 and 2021. We use the Difference-in-Differences estimator to evaluate the policy impact, in which we compare the outcomes of projects in the policy categories that were launched after the implementation of the policy (treatment group) treated with projects in non-policy categories, as well as projects in the policy categories that were launched before the policy implementation (control group). Our DiD estimates indicate, following the policy, a 4.4% increase in the funding success rate and a 2.9% increase in pledged funding ratio for projects in the categories that implement E-Policy. Although the policy introduction is plausibly exogenous to creators and backers, creators can choose whether to make environmental commitment. In fact, 32.5% creators took up the option in their projects.[4] Given that 77.5% creators did not take up the option, we interpret the above

[3] While creators can discuss environmental engagement in the campaign story section before the introduction of E-Policy, we argue and show that E-Policy is more effective in inducing creators to do so. Our data indicate that only 3.2% projects provided this discussion, which is in stark contrast to 32.5% of projects that adopted E-Commitment after the policy rollout. See our detailed discussion on this issue and the corresponding empirical analyses in section 6.3.

[4] Throughout the paper, we refer to these projects as "E-Commitment projects" or "green projects" interchangeably.

results as the intention-to-treat effect of environmental engagement (ITT). Due to non-compliance, ITT understates the treatment effect of E-Commitment. Thus, we employ an instrumental variable approach by instrumenting E-Commitment with the policy rollouts to estimate the local average treatment effect (LATE). We find E-Commitment increases the funding success rate by 13.2% and the pledged funding ratio by 8.7%, respectively.

Given that 32.5% creators opt into E-Commitment disclosures after they become available, we next explore why not all creators choose to do so, if doing it improves funding outcomes. As local culture and norms shape backers' environmental taste, we focus our analysis on exploring projects' geographical attributes. The idea is that some projects have national appeal whereas others appeal to local backers (Bai, Kerr, Wan, and Yorulmaz 2023). Assuming that environmental preference is largely homogenous at the local level (i.e., state) but heterogeneous at the national level, information asymmetry between creators and backers is higher for out-of-state backers. Therefore, projects that appeal to local backers benefit less from opting in E-Commitment disclosures. Accordingly, we expect a higher likelihood of opting for E-Commitment disclosures for creators of projects with national appeal. To test this hypothesis, we trained a BERT model (Bidirectional Encoder Representations from Transformers) from Google to determine whether Kickstarter projects primarily attract local backers (i.e., backers from the creator's state) or garner national support from multiple states.[5] Consistent with this prediction, the evidence shows that national projects have a 33.9% higher likelihood of undertaking the E-Commitment option. Moreover, we find that, ceteris paribus, national projects with environmental commitment attract 11.8% more backers from regions of high environmental awareness. These findings suggest that projects' geographical appeal

[5] Our training dataset comprised all projects launched between 2010 and 2016 that received support from 50 or more backers, allowing us to better analyze the geographic distribution of backers. Specifically, projects where 5% or fewer of the backers were from the creator's state were classified as national; projects with 50% or more backers from the creator's state were classified as local. The model achieved an F1-score of 88.1%, indicating a high level of accuracy in this binary classification (national versus local projects). This custom BERT classifier was then used to predict the likelihood of each project in our dataset attracting national support.

serves as a significant factor, and more broadly speaking, constraining factors exist influencing creators' decisions to adopt E-Commitment disclosures.

Next, we aim to uncover whether tangible or intangible motives drive the observed pattern. Creators opting in environmental engagement often discuss products' long-lasting design, reusability and recyclability, sustainable materials, environmentally friendly factories, and sustainable fulfillment and distribution. This suggests that implementing E-Commitment disclosures can lead to increased costs for creators, as they may require additional time, effort, and resources to meet the commitments. As expected, E-Commitment projects show a longer time to delivery, with an increase of approximately 51.4% (around 29.2 days), and a higher minimum reward size (i.e. the smallest amount a backer can pledge in a crowdfunding project), which increases by 53.8%. While the evidence suggests the green projects cost backers more, do they also have a higher delivery rate? We find no evidence of this: conditional on a project being funded successfully, E-Commitment disclosures have no measurable effect on project delivery rate. The findings suggest that the positive effect of E-Commitment disclosures on funding outcomes is likely to be explained by backers' intangible motives. If tangible motives were the primary driving factor in which creators adopt E-Commitment to signal better project quality, one would expect green projects to have a higher likelihood of product delivery without a significant increase in delivery times and capital requirements. The results also indicate that E-Commitment disclosures go beyond mere greenwashing, as creators are observed to fulfill their commitment disclosures.

To further sharpen the inferences of intangible motives for backing E-Commitment projects, we proceed in three steps: First, we examine whether backers' support for E-Commitment reflects their distinct environmental taste. Previous research in marketing and finance suggests that consumers and investors with positive attitudes of environmental protection are more willing to purchase green food (Tanner and Kast, 2003) and ESG oriented

portfolios (Hong, Hubik, and Stein, 2005), and their preferences tend to be shaped by their local social norms (Hines, Hungerford, and Tomera, 1986/87; Hong, Hubik, and Stein, 2005), culture (Chui, Titman, and Wei, 2010), and local vibe (Coval and Moskowitz, 1999; Riedl and Smeets, 2017). We thus conjecture that E-Commitment attracts backers from regions considered environmentally conscious. A statewide level of environmental awareness is inferred from state-level google search volume (SVI) for the phrase "environmental impact". We find evidence consistent with this conjecture: E-Commitment disclosures increase the number of environmental backers by 53.3% (equivalent to seven backers). In contrast, there is no evidence that E-Commitment disclosures affect the number of less environmentally conscious backers.

Second, we examine the effect of E-Commitment on new backers versus experienced backers. If E-Commitment attracts backers with environmental preferences who may not have otherwise participated, we expect a positive relationship between E-Commitment disclosures and new backers' engagement. The evidence gathered supports this conjecture, as we find that E-Commitment disclosures increase the number of new backers by approximately 29%. In contrast, E-Commitment disclosures have no measurable impact on experienced backers.

Third, we examine the sentiment of backers participating in green projects through their comments. The analysis reveals that projects with E-Commitment disclosures receive a higher number of comments from backers specifically related to environmental engagement (i.e., E-Comment), with an increase of approximately 8.4%. Additionally, we find about 97% of E-Comments contain positive sentiment, supporting the argument that green projects have an appeal to backers who prioritize environmental concerns. Our findings provide support for the notion that E-Commitment disclosures offer an intangible benefit to backers, allowing them to align their values and contribute to projects that promote environmental engagement.

While our evidence suggests that backers' preferences for environmental engagement drive creators' decisions to make E-Commitment, can creators' own environmental preferences also play a role? Using creators' past entrepreneurship experience and geographical location to identify new creators and creators with environmental concerns, respectively, we find no evidence that E-Commitment effectively draws in new creators or environmentally conscious creators. These results further highlight that creators cater to backers' environmental preferences when committing environmental engagement, while their own environmental concerns do not seem to play a significant role.

We conduct several robustness checks. First, we test the parallel trends before the roll out of E-Policy and find no differential trend in funding outcomes between the E-Policy category and non-E-Policy categories. This evidence alleviates concerns about potential reverse causality, specifically regarding whether the increasing trend of funding outcomes led to the implementation of E-Policy. Second, in order to address potential limitations of the traditional difference-in-differences (DID) estimation, we utilize the stacked regression technique and re-estimate the effect of E-Policy. Our results show that the positive effect of E-Policy on funding outcomes is robust to the stacked regression estimate.

Our study makes three primary contributions. First, it adds to the nascent literature on dissecting the motives for ESG investing (Hong et al. 2021). Previous studies have identified pecuniary motivations and behaviors related to ESG investing. For instance, Michaely, Ordonez-Calafi and Rubio (2021) finds that mutual fund managers may engage in greenwashing by supporting environmental and social proposals that do not reach the majority threshold but oppose them when their vote could be pivotal. Another study by Du, Harford, and Shin (2022) shows that banks issue sustainability-linked loans primarily driven by pecuniary motives. Additionally, retail investors tend to trade based on ESG news when they perceive it to be material to a stock's financial performance (Li, Watts, Zhu 2024). Our study

adds to this body of literature by providing evidence that suggests at least some investors/ consumers make investment/purchase decisions based on non-pecuniary, intangible preferences. That is, these individuals consider factors beyond purely financial returns, such as environmental, social, or governance considerations, even though doing so requires financial sacrifice. This research can potentially aid in understanding the broader implications of ESG factors on investment decisions and contribute to the ongoing dialogue surrounding sustainable and responsible investing practices.

Second, our study builds upon previous research regarding consumer preferences and their willingness to pay for Environmental, Social, and Governance (ESG) factors. Within marketing research, Berger (2019) theoretically and empirically shows that green products can have a signaling benefit and this benefit acts as an incentive for consumers to pay a premium for environmentally friendly products. Distinct from his findings, our study shows no evidence of signaling in creators' decisions to adopt environmental commitment. Using survey questionnaires, Hao et al. (2019) and Gomes, Lopes and Nogueira (2023) find that environmental concerns determine individuals' consumption of green products and green packaging and positively influence willingness to pay more for the greenness. In the accounting literature, recent research such as Leonelli et al. (2024) and Beyer et al. (2024) demonstrates that consumers favor companies with positive ESG profiles and have preference for products like low-carbon-intensive food. Departing from these studies, our research explores the specific costs consumers might face when they prioritize such intangible benefits. We therefore provide new insights into the trade-offs and considerations that shape decision-making processes based on non-financial, intangible factors.

Third, although the study does not directly compare the funding outcomes between a mandatory regime and a voluntary regime concerning environmental disclosures, its findings have implications for this issue. The results indicate significant heterogeneity in the preferences

of backers regarding environmental engagement. Therefore, a one-size-fits-all sustainability policy might not effectively enhance certain creators' ability to attract funding from backers with less interest in environmental issues, such as returning backers. To maximize the overall welfare of both creators and backers, policymakers need to carefully consider how to design a disclosure regime.

2. Institutional Background of Environmental Commitment Initiative, Related Theory, and Hypothesis Development

2.1 Creating and Investing on Kickstarter Platform

Projects on Kickstarter are grouped into 15 broad categories, including Art, Comics, Crafts, Dance, Design, Fashion, Film & Video, Food, Games, Journalism, Music, Photography, Publishing, Technology, and Theater. In a typical Kickstarter campaign, interested backers provide monetary pledges and in return receive nonbinding and non-enforceable promises from creators to deliver "rewards", which can be in the form of finished products, early-stage prototypes, or early access to certain services in the future (Krishnan et al., 2017). For example, contributors to the launch of a bakery might receive a baked loaf of bread or a one-on-one cooking class with the chef, depending on the size of their financial support. The funding period for projects on Kickstarter ranges from one to 60 days, with 30 days being the most common duration. If the total pledges received during the funding period meets or exceeds the pre-set funding goal, the project is considered funded. Otherwise, all funding is returned to the original backers and the project goes unfunded (i.e., unsuccessful campaign).

The relatively small amount of monetary value of pledges and the lack of equity on a reward-based crowdfunding platform such as Kickstarter begs the question of why backers are motivated to invest in these projects. The empirical evidence to date has been rather mixed: Gerber et al. (2012) find that in addition to the consumption of products and experiences, many people are motivated by non-financial motives to participate because of social interactions

realized through crowdfunding platforms, such as feelings of connectedness to a community with similar interests and ideals. In a similar vein, Boudreau et al. (2021) find that that the main tangible reward of a crowdfunding project plays only a limited role in motivating crowdfunding. Moreover, they document three non-pecuniary funder motivations as the main factors that contribute to crowdfunding: (a) a "common cause" between funders and entrepreneurs; (b) reciprocity: giving back to the entrepreneur for consumption; and (c) signaling to enlist others to support the entrepreneurial crowdfunding project. However, Cholakova and Clarysse (2015) find opposite results: their evidence based on field experiments shows that nonfinancial motives (e.g., help others, be a part of a community, trust others) play no significant role in explaining backers' investment decisions.

2.2 Institutional Background of Environmental Commitment Initiative

In the late 20th century, with the advancement of scientific research on climate change and global warming gaining prominence in the late 20th century, organizations like the Intergovernmental Panel on Climate Change (IPCC) started regularly publishing reports highlighting the human-induced causes and potential impacts of climate change. Simultaneously, international collaboration between leading economies led to Kyoto Protocol (1997) and the Paris Agreement (2015) further underscored the urgency of addressing climate change on a global scale and helped raise people's awareness about climate issues.

As crowdfunding platforms like Kickstarter gained popularity, they also faced scrutiny over the types of projects they hosted and their potential environmental consequences. In response to the rising awareness and potential criticism, in late 2018, Kickstarter launched its "Environmental Commitment" initiative, which is developed in collaboration with the Environmental Defense Fund (EDF).[6] The initiative focuses on embedding sustainable

[6] See for instance, https://www.edf.org/blog/2019/01/30/why-kickstarters-green-products-push-bigger-deal-you-think

practices in the creation and development of projects from their inception. To support creators who are interested in adopting sustainable practices, the platform offers case studies and examples of environmentally friendly practices at their hub under “Kickstarter Environmental Resources Center”. Importantly, this initiative has garnered media attention and is widely disseminated within the investment community.[7]

The initiative involves a staggered rollout of an "Environmental Commitments" section at project category level, which would allow project creators to publicly pledge their commitment to environmentally friendly practices. For example, the “Environmental Commitment” initiative was introduced to the Design category on October 23, 2018, while not being introduced to the Comics category until 31 of August 2020. We create an indicator variable, E-Policy, to capture the staggered rollout timing of project categories that implemented the “Environmental Commitments” section. As of the end of 2021, all product categories, except for Theater and Film & Video, offer this environmental engagement option. Importantly, a clear positive correlation exists between the total pledged amount and the timing of the category-level implementation of environmental commitment initiatives.

After a given project category implements E-Policy, creators launching projects falling in this category have the option to make commitments in key areas like long-lasting design, reusability and recyclability, sustainable materials, environmentally friendly factories, and sustainable distribution. These commitments, in the form of a disclosed narrative, are then displayed in a new "Environmental Commitments" section on their project campaign pages, signaling to potential backers the project's commitment to reducing its environmental impact. To get a sense of what is often disclosed in the “Environmental Commitment” section, Figure 2 shows the word cloud of environmental-related two-word phrases (i.e., bigrams), where

[7] See https://www.forbes.com/sites/edfenergyexchange/2018/11/27/kickstarters-new-features-put-sustainability-top-of-mind-for-creators/?sh=19dae41744ae

phrases that are mentioned more frequently are larger in size and more “orange” in color. It is evident that popular words such as “carbon footprint”, “long last”, recycle”, and “environmental impact” often appear in these disclosures.

Importantly, however, the utilization of the "Environmental Commitments" section and the associated disclosure are non-binding. That is, a given creator can choose not to take advantage of this section and provides no additional disclosure related to their efforts to adopt the E-Policy. Thus, we create a second indicator variable, *E-Commitment*, to capture individual creators’ actual usage of the "Environmental Commitments" section. At the aggregate level, we see suggestive evidence that E-Policy at the category level instituted by Kickstarter seem to play an important role: Figure 3 shows that for the three most popular project categories – Design, Games, and Technology – together representing roughly 73% of the total pledged amounts over our sample period, experienced a noticeable increase in the total pledged amount (for the entire Kickstarter platform) after these categories adopted E-Policy. Furthermore, we also observe some heterogeneity among the three categories with the Design category experiencing the largest increase in the weight of the pledged amount.

2.3 Related Literature and Hypotheses Development

From a theoretical perspective, one could understand the potential impact of environmental engagement on funding outcomes from the lens of signaling (Spence 1973). In the seminal work, Spence primarily addresses the challenges arising from information asymmetry between transacting parties—in his original context, between job applicants and employers—and delineates how individuals can use costly signals to convey their underlying, otherwise unobservable, qualities. In the context of crowdfunding, significant information asymmetry exists between backers and creators because backers have limited means to assess the intrinsic value, potential for success, and creators’ ethical commitments (Agrawal et al., 2014). If low-quality creators bear disproportionally higher costs in environmental

engagement compared to high-quality creators, environmental commitment can function as a signal to differentiate high-quality projects from low-quality ones. As a result, creators who demonstrate environmental commitment are predicted to have a higher likelihood of achieving funding success. We term this argument as "signaling".

However, it is also plausible that environment engagement is "cheap talk", enabling low-quality creators to exploit backers who favor environmentally friendly projects without the actual ability or intention to truly offer such options. For example, Edmans and Kacperczyk (2022) and Hong and Shore (2023) discuss that some shareholders make investment decisions out of non-pecuniary motives (e.g., Fernando, Sharfman, and Uysal 2017; Starks, Venkat, and Zhu 2017). Under this scenario (dubbed "cheap talk"), there would still be a positive relation between environmental engagement and funding outcomes.[8]

A third possibility is that creators cater to backers' preferences (dubbed "catering"). That is, creators understand backers' heterogeneous preferences (pecuniary vs. non-pecuniary) for environmental projects. When the creator expects that her project appeals to sufficiently large non-pecuniary backers, she will make environmental commitment. Otherwise, she will not. Under this scenario, environmental commitment is also predicted to be positively associated with funding outcomes, because doing so attracts more non-pecuniary backers who would not otherwise support the project.

[8] Note that independently developed theories from distinct fields such as social psychology, economics, and management all generate similar predictions. In social psychology, the Social Identity Theory, pioneered by Tajfel and Turner (2004), argues that individuals derive a sense of self and belonging from their identification with social groups. When a crowdfunding platform like Kickstarter introduces environmental engagement initiatives, backers who prioritize environmental values may develop a shared identity with the platform and project creators, leading to increased support and funding. In a similar vein, the Norm Activation Model (Schwartz, 1977) suggests that individuals are more likely to engage in pro-environmental behaviors when they perceive environmental issues as personally relevant and feel a sense of moral obligation to act. Kickstarter's environmental initiatives can activate norms of environmental responsibility among potential backers, increasing their willingness to support environmentally engaged projects. From the management literature, Carroll (1979) systematically advanced the notion of corporate social responsibility, emphasizing reputational benefits and enhanced consumer trust for socially responsible organizations. This suggests crowdfunding campaigns highlighting environmental engagement may signal social responsibility to backers, aligning with their values and increasing their trustworthiness and impact. As a result, crowdfunding campaigns that prioritize environmental engagement signal to backers that project creators are socially responsible and deserving of support.

Following the above lines of reasoning, we formally state the first hypothesis in its alternative form:

H1*: Environmental engagement increases funding success and the amount of pledges relative to the funding goal.*

Next, we develop additional hypotheses to dissect backers' motives for supporting projects with environment engagement. Pecuniary (tangible) motives refer to the desire that companies maximize cash flows by improving their brand image and corporate reputation through sustainability initiatives. Doing so can attract more (and better) employees and customers, capturing newly arising business opportunities due to climate change (Du, Harford, and Shin 2022), and avoiding possible environmental fines. In the context of Kickstarter projects, if backers support environmental projects out of tangible motives, that is, under signaling argument – backers consider that projects with environmental commitment are of high quality, we expect a positive relation between projects with environmental commitment and product delivery rate.

As to non-pecuniary (intangible) objectives, they typically involve two non-mutually exclusive aspects: One is that investors are driven by social goals to preserve the environment and the planet, and to avoid investing in business operations or assets that generate excessive carbon emissions, even if achieving these goals might entail sacrificing some financial returns (e.g., Fernando, Sharfman, and Uysal 2017; Starks, Venkat, and Zhu 2017). The other is that investors have an inherent preference for environmentally friendly investments, irrespective of financial returns. This perspective suggests that investors desire to hold "green" investments and avoid "brown" investments (e.g., Hartzmark and Sussman 2019), as the latter generate disutility.[9] The two aspects imply that backers with intangible motives do not care or care less

[9] Hong and Shore (2023) provide a comprehensive review of empirical evidence on shareholders' underlying motives for supporting corporate social responsibility. They summarize the literature by focusing on seven tests including costs of capital (e.g., Chava 2014; Goss and Roberts 2011), performance of the portfolio (e.g., Hartzmark and Sussman 2019), ownership by types of institutions (e.g., Fernando, Sharfman, and Uysal 2017;

about product delivery rate. Under the catering argument, where creators cater to backers' preferences, we predict no or even negative relationship between environmental commitment and product delivery rate. The cheap talk argument generates similar prediction as the catering argument, because strategic low-quality creators, who by definition have low product delivery rate, use environmental commitment as a means to attract non-pecuniary backers.

However, subtle differences exist between the cheap talk argument and the catering argument. The former suggests that creators engage in greenwashing whereas the latter implies "walk the talk". Similar to the latter, the signaling argument also implies "walk the talk", because, under this argument, high-quality creators actually invest resources and effort in making environmental commitment, which separates them from the low-quality creators.

The above discussion leads to our second group of hypotheses stated as follows:

H2a *(Signaling): If backers' tangible motives are the primary factor driving their support for environmental projects, we expect a positive relationship of environmental commitment with the likelihood of project delivery and with that of "walk the talk".*

H2b *(Catering): If backers' intangible motives are the primary factor driving their support for environmental projects and creators cater to their preferences, we expect a non-positive relationship of environmental commitment with the likelihood of project delivery, but a positive relationship with that of "walk the talk".*

H2c *(Cheap talk): If backers' intangible motives are the primary factor driving their support for environmental projects and creators engage in cheap talk, we expect a negative relationship of environmental commitment with the likelihood of project delivery and with that of "walk the talk".*

Starks, Venkat, and Zhu 2017), surveys and experiments (e.g., Bauer, Ruof, and Smeets 2021; Riedl and Smeets 2017), managerial motives (e.g., Cheng, Hong, and Shue 2023), shareholder proposals (e.g., Flammer 2015), and firm inclusion in responsibility indices (e.g., Edmans 2011). The evidence predominantly indicates that shareholders are driven by nonpecuniary motives, focusing on actions taken under a highly specialized context and mostly limited to large, publicly traded U.S. firms.

By extension of H2, our third hypothesis concerns the cost of green orientation. If E-Commitment is costly as implied in H2a and H2b, because doing so often requires creators to search for recyclable packaging materials and design products creatively to ensure long lasting, we expect these products to take longer time to produce and to command a higher price for backers to compensate creators (i.e., the minimum reward size). However, under the cheap talk argument, we expect creators to engage in greenwashing, which predicts no relation between environmental commitment and delivery time and reward size[10].

H3a *(Signaling and catering): We expect a positive relation of environmental commitment with project delivery time and reward size.*

H3b *(Cheap talk): We expect no relation of environmental commitment with project delivery time and reward size.*

3. Data Sources, Sample Construction, and Empirical Methodology

3.1 Data Sources and Sample Construction

Our primary data source is Kickstarter.com, one of the largest reward-based crowdfunding platforms. Entrepreneurs and creators seeking funding for a particular creative project post information about their project and funding needs on a dedicated web page, which typically includes a video, images, text, funding status, and reward tiers. To build our analytical sample, we scrape project description pages at Kickstarter.com. Given that the first environmental engagement was implemented in October 2018, to trade off the scraping cost against its benefit, we start the sample from January 1, 2016 and end on December 31, 2021. Our final sample consists of 173,874 observations of unique projects. Table 1 provides the summary statistics on key statistics of the analytical sample. Appendix C shows the staggered introduction of the category-level environmental policies.

[Insert Table 1 Here]

[10] Please see Appendix B for the structure of the hypothesis development for H1 and H3.

Several patterns are noteworthy: First, the campaigns' success rate (i.e., *Success*) is relatively low, as only 27.2% of launched projects are fully funded based on their pre-set goals. Accordingly, the pledged amount scaled by the funding goal has an average of 0.506, and the distribution is rather skewed to the right, with a few successful projects that are significantly overfunded. The funding goal of an average project is roughly $45,178 with the distribution again skewed heavily to the right, with the median funding goal around $5,000 (i.e., 1/9 of the mean value). Conditioning on successful funding, 72% of projects delivered products, and the average time from the closure of a funding campaign to product delivery is 42 days.

[Insert Table 2 Here]

Table 2 shows the correlation matrix between key variables used in our analysis. Two observations are worth noting. First, the correlation (corr. coeff.= 0.52) between *E-Policy* and *E-Commitment* is high, suggesting that E-Policy indeed has a significant push for creators' environmental engagement. Second, *E-Commitment* is positively associated with both success (corr. coeff. = 0.07) and pledged funding rate (corr. coeff. = 0.07). Thus, we find univariate level evidence that is consistent with the prediction of H1.

4. Main Results

The adoption of E-Policy is plausibly exogenous to both creators and backers because Kickstarter determines which project category and when to adopt the policy. Therefore, we can test H1 by estimating the effect of E-Policy on funding outcomes (i.e., DiD estimate of *E-Policy*). However, 32% rather than 100% creators took up this option as E-Policy allows creators to choose whether they make environmental commitment or not. Therefore, the DiD estimate only gauges the intention-to-treat effect (ITT) and can underestimate the treatment effect of environmental engagement. Following Field (2007), we estimate LATE by instrumenting environmental engagement with the E-Policy introduction.

4.1Intention-to-treat Effect of Environmental Engagement

We run the following DiD regression to estimate the intention-to-treat effect:

$$Funding\ Success_{i,t} = \beta_0 + \beta_1\left(E - Policy_{c,t}\right) + \gamma_i X_{i,t} + Fixed\ Effects + \varepsilon_{i,t}, \qquad (1)$$

where *i*, *c*, and *t* are project, project category, and time indices, respectively. Our main variable of interest is *E-Policy*, which is an indicator variable equal to 1 if a project category, *c*, has implemented E-policy in *t*, and 0 otherwise. $X_{i,t}$ is a vector of control variables, capturing characteristics of a project and its creator: the target dollar amount of funding (*Goal*), and the minimum reward offered by the project creator (*Minimum Reward)*. We also include the length of the brief project description (*Blurb*), measured as the logarithm of the number of words in the project blurb. Several previous studies have documented that projects with longer blurbs are more likely to achieve funding success and on average obtain more funding (Cascino et al. 2019; Kuppuswamy and Bayus 2018). Other project-level control variables include the number of frequently asked questions listed on the FAQ tab (*FAQ*), the number of updates during the funding period (*Updates*), the number of comments during the funding period (*Comments*), the duration that the project is available on Kickstarter (*Horizon*), self-mention dummy (*Self-Mention*), staff-pick dummy (*Staff Pick*). Prior studies find that successful projects tend to have a more modest funding goal and a shorter funding period and are more likely to be picked by Kickstarter staff as "project we love" (Kuppuswamy and Bayus 2018). For creator characteristics, we include the total number of projects successfully funded previously for a given creator (*Previous Success*), the number of other projects created by the creator (*Other Projects*), and creator's gender (*Gender*) (Pope and Sydnor 2011; Gorbatai and Nelson 2015), because these creator characteristics have been found to impact funding success (e.g., Gafni et al. 2021). Finally, in all regression models, we include three sets of fixed effects absorbing time-invariant variables at project category, location, and time levels.

We measure funding outcomes with two variables. The first one is an indicator variable, *Success*, which is equal to one if the project is successfully funded, and zero otherwise. The

second one is a continuous variable, *Pledges*, which is calculated as the total amount pledged to the project, scaled by the project funding goal.

We present the results of this exercise in Panel A of Table 3. The estimated coefficient of *Success* and *Pledges* on *E-Policy* is 0.044 (column 1) and 0.029 (column 2), respectively. Both coefficients are positive and significant at the 1% level. In terms of economic magnitude, *E-Policy* increases the probability of project success by 4.4%, which corresponds to approximately 16.2% (i.e., 4.4%/27.2%) of the sample average success rate of 27.2%. With respect to the amount of money raised, *E-Policy* is associated with a 2.9% increase in *Pledges*, which is roughly 5.7% of the sample average of 50.6%. It is evident that the platform's introduction of going-green policies (i.e., *E-Policy*) has a positive impact on funding outcomes and they represent a sizeable impact in the aggregate: with each category containing roughly 13,375 projects in our sample period, it implies that E-Commitment can help a category raise $3.5 million more dollars in pledges.[11]

Coefficients on control variables also have the expected signs. For instance, the negative coefficient on *Goal* indicates that larger projects asking for more funding tend to have a lower success rate. Consistent with Cascino, Correia and Tamayo (2019) and Lai, Lo and Hwang (2017), the coefficients on *Updates* and *Comments* are both positive and significant, which suggest that projects for which creators provide a higher level of disclosure, or backers and creators have more engaged communications through comments tend to be more successful.

[Insert Table 3 Here]

4.2 The Local Average Treatment Effect

To estimate LATE, we instrument E-Commitment with E-Policy and run the following Two-Stage Least-Squares (2SLS) regression.

[11] This number is calculated by using the average U.S. dollar amount of each project ($9,015), times the average number of projects in each category (13,375) and the E-Policy effect of 2.9% increase in the pledged amount.

1st stage: $E-Commitment_{i,t}$

$$= \alpha_0 + \alpha_1\left(E-Policy_{c,t}\right) + \delta_i X_{i,t} + Fixed\ Effects + \mu_{i,t}, \quad (2)$$

2nd stage: $Funding\ Success/Pledge_{i,t}$

$$= \beta_0 + \beta_1\left(E-Commitment_{i,t}\right) + \theta_i X_{i,t} + Fixed\ Effects + \epsilon_{i,t}, \quad (3)$$

where all the variables are defined analogously as in Equation (1). In the 1st stage regression, we estimate the effect of implementing E-Policy on creators' decision to take up E-Commitment. We argue that the categorical implementation of E-Policy by Kickstarter and the exact timing of the decision is plausibly exogenous to an individual creator's preference, consequently satisfying both the relevance and exogeneity requirement for a valid instrument.

The results are presented in Panel B of Table 3. For the 1st stage regression, as is shown in column (1), the coefficient on *E-Policy* is positive and statistically significant at the 1% level. This is consistent with the design that *E-Commitment* is only enabled after *E-Policy* is introduced. The 2nd stage regression results are reported in columns (2) and (3), where we regress *Success* and *Pledges* on the instrumented value of *E-Commitment* from the first stage. The estimated coefficients of $E-\widehat{Commitment}$ are 0.132 and 0.087, respectively, and both are positive and significant at the 1% level. In terms of economic magnitude, as expected, both coefficients are larger compared to their DiD estimates, confirming that ITT underestimates the treatment effect. The results indicate that the presence of environmental engagement increases funding success rate by 13.2% and the pledged funding amount by 8.7%. Taken together, we find evidence supporting H1, suggesting that environmental engagement improves funding outcomes.

5. The Motivation for Environmental Commitment

After documenting a strong and robust positive impact of environmental engagement on funding outcomes, we investigate the driving forces behind these effects. Specifically, we try to differentiate the tangible motives from the non-tangible motives by separately examining

three different outcome variables: product delivery probability, delivery time, and minimum required amount of pledge (dubbed by the platform as the minimum 'reward size'). Importantly, these tests (H2a, b, and c, as well as H3a and H3b) allow us to further disentangle the different arguments – signaling, cheap talk, and catering – and their corresponding predictions. Throughout the remainder of our analyses, we estimate the 2SLS regression models to directly account for the non-compliance.

5.1 Testing H2: Examining Backer Motivation for Backing E-Commitment Projects

In this section, we aim to test and distinguish various arguments that lead to the predictions of H2a, H2b, and H2c. To this end, we focus on both the tangible and intangible rewards to shed light on the underlying motivations of backing green projects. Since the main tangible reward to Kickstarter backers is the delivery of a prototype physical product or early access to service and other digital products (e.g., music or digital media release). We thus consider product delivery as the main tangible reward. If environmental commitment signals project quality, and backers' decisions to fund green projects are primarily driven by financial motives, we would expect that the environmental commitment initiatives lead to a significant increase in the probability of product delivery (H2a).

Kickstarter does not have a readily available indicator for whether a product is delivered after the funding campaign concludes. Therefore, to track product delivery, we follow Bai et al. (2024) and parse all the updates issued in the year after the end of fundraising. We code *Product Delivery* as a binary variable, which takes a value of one if both of the following conditions are met: First, words that suggest negation ("not" or "n't") do not appear in one or more sentences in subsequent updates; Second, updates have one or more of the following word appear: "ship", "sent", "send", "mail", and "receive". We acknowledge that this is noisy proxy of the actual delivery, but we believe that there is not any inherent issues in our approach that would bias the measure in one direction versus the other.

[Insert Table 4]

We estimate a similar set of 2SLS IV regressions as in Equation (2) and (3), with the only difference that we replace *Funding Outcomes* with *Delivery*. The second stage results of these regressions are reported in Table 4. The coefficient on the instrumented *E-Commitment* is positive but statistically indistinguishable from zero. This evidence rejects H2a and the notion that backers support green projects because of their tangible motivations. The results are also at odds with H2c – the Cheap Talk Hypothesis – which predicts a strictly negative correlation between the two. Instead, the insignificant coefficient estimate seems more consistent with H2b – the Catering Hypothesis – which predicts a negative or insignificant relationship between environmental commitment and the likelihood of project delivery.

5.2 Testing H3: the Cost Implication of Environmental Commitment

Since environmental commitment leads to an insignificant change in the probability of product delivery, backers are unlikely to be aiming for tangible benefits alone. If backers are supporting green projects because of non-pecuniary motivations, they might be willing to make additional financial sacrifices. Intuitively, for a project to show demonstrable commitment to be green, it requires a holistic approach to the manufacturing process. For instance, there are certain requirements and restrictions on the materials that are considered environmentally friendly, the locations from which these materials should be sourced, as well as the manufacturing technique and process that can be utilized. Occasionally, it could even involve requirements on the packaging or the delivery method of the products. Because of these additional considerations, environmental commitment likely increases the time for creators to deliver the final product as well as the cost of manufacturing.

Therefore, in this section, we further differentiate the competing arguments by first examining the impact of environmental commitment on two main outcome variables that gauge the costs of E-Commitment: the time it takes for a project to be delivered (i.e., *Log(Delivery*

Time in Days)), and the minimum reward size (i.e., *Log(Reward Min)*). We then analyze the "walk the talk" perspective by examining whether and how environmental commitment alters backers' interaction with project creators via environment-related comments (i.e., *E-Comments*) and the tone of this interaction. The logic behind this analysis is that, if creators follow through on their environmental commitments, backers would be more likely to provide feedback on creators' environmental engagement, leading to a higher level of *E-Comments*.

The first outcome variable, *Log(Delivery Time in Days)*, is defined as the logarithm of the number of days between the end of the funding campaign and the presumable time of delivery; The second outcome variable, *Log(Minimum Reward)*, is measured as the logarithm of the minimum level of pledged dollar amount set by the project creator. The results of this exercise are presented in Table 5.

[Insert Table 5]

As shown in column (1), we find a positive and significant coefficient of 0.514 when regressing *Log(Delivery Time in Days)* on instrumented *E-Commitment* with a t-statistic of 2.33 (significant at the 5% level), which implies that, as the probability of environmental commitment increases from 0 to 1, there is an average increase of 51.4% (equivalent to approximately 21 days increase) in the time it takes to deliver the product increases . When we regress *Log(Reward Min)* on instrumented *E-Commitment*, we find a positive and statistically significant coefficient of 0.538 with a t-statistic of 4.99, which implies that environmental commitment leads to a 53.8% increase in the minimum pledge.

These results are consistent with H3a and H3c, providing empirical support for both the signaling hypothesis and catering story, but are inconsistent with the cheap talk argument (H3b) which predicts no relationship between environmental commitment and project delivery and reward size.

Next, we investigate the number and tone of environmentally related comments to shed light on the perspective of creators' "walk the talk" and the gains to backers who hold intangible preferences. We construct two outcome variables. The first is *E-Comments*, which is essentially a binary variable for the existence of one or more prominent environmental-related bigrams in the comment section (see Figure 2). The logic behind this variable is that, if creators genuinely fulfill their environmental commitment, it is likely to be reflected in the comments left by backers. The second is *Positive E-Comments*, which is a binary variable that takes the value of one if the comment section contains environmental-related bigrams and the tone of comment section is positive, and zero otherwise. The rationale is that, if backers truly appreciate and derive satisfaction from the the environmental value provided by the project, it is expected to be reflected in their positive tone when discussing the project in the comment section. We assess comment tone using VADER, a lexicon and rule-based sentiment analysis tool that is specifically designed to interpret and quantify the emotional tone of social media language.[12]

The results of this exercise are in Table 5. Column 3 and 4 contain results using *E-Comments* and *Positive E-Comments*, respectively. We find that environmental engagement leads to a statistically significant 8.4% increase in the number of environmentally related comments, and 8.5% increase in *E-Comments* that are classified as positive. Both coefficients are positive and significant with t-values well above 3. The similarity in the magnitude of the estimated coefficients is not surprising given that the predominant (i.e., around 97%) of all *E-Comments* are positive in their tone.

[12] VADER (Valence Aware Dictionary and sEntiment Reasoner) is a sentiment analysis tool that is specifically attuned to sentiments expressed in social media. It uses a combination of a lexicon and rule-based reasoning to determine the sentiment of textual content, particularly focusing on the intensity of emotion that words convey. This method is especially effective due to its sensitivity to both the polarity and the intensity of sentiments expressed in different contexts, including slang, emoticons, acronyms, and other informal expressions commonly found in social media texts.

Recent work on crowdfunding highlights the importance of the comments section as an important venue for backers to engage with project creators (Wang et al. 2018; Song and Tian 2020). Some studies find that the dynamics between backers and creators in the comments section can have significant predictive power for funding success (Lai, Lo and Hwang 2017). We interpret backers' increased participation and engagement as evident from our results as further proof that backers enjoy the engaged discussion with creators on environmental related topics, and that they derive intangible benefits from such communications.

Taken together, the results on delivery time and minimum reward size provide convincing proof for the intangible motivations of backers in supporting green projects, as outlined in H3. Further evidence on *E-Comments* corroborate the notion that creators indeed walk the talk, and backers derive utility from participating in the project creation process, actively communicating with creators with overall positive tone. These findings are also more broadly in line with the recent papers by Hong, Wang, and Yang (2021) and Hong and Shore (2023) that document non-pecuniary goals being the primary motivations for investors in more traditional financial contexts.

6. Additional Analysis and Discussion

The results from the previous sections support the argument that creators cater to backers' intangible preferences in making environmental commitment, and backers support green projects out of environmental concerns. In this section, we analyze the attributes of backers and creators to further sharpen these inferences, under the catering argument.

6.1 Who Creates and Backs Green Projects

6.1.1 Backers from Regions of High Environmental Awareness

The first analysis we undertake is to examine who backs green projects. The catering argument predicts that E-Commitment are more likely to draw backers who have environmental concerns. Previous research suggests that investors' preferences, including their

willingness to hold ESG oriented portfolios, tend to be shaped by their local social norms (Hong, Kubik, and Stein, 2005), culture (Chui, Titman, and Wei, 2010), and local vibe (Coval and Moskowitz, 1999; Riedl and Smeets, 2017). We thus use backers' geographical states to gauge their environmental preferences. To identify high environmental awareness regions, we obtain monthly country- and state-level google search volume (SVI) for the phrase "environmental impact" over the period of January 2016 (the first month of our sample period) to September 2018 (the month immediately before the first E-Policy implementation). If the average SVI of a state exceeds the national average, the state is considered to have a high level of environmental awareness.[13]

[Insert Table 6]

The 2SLS regression results are contained Table 6 Panel A, testing the relation between *E-Commitment* and the number of environmentally conscious backers. In column (1), in which the number of backers (in log) from high E-Awareness regions serves as the dependent variable, the coefficient on $E-\widehat{Commitment}$ is 0.533. The evidence is consistent with our expectation that environmental commitment attracts 53.3% more backers from regions of high environmental awareness. Can results in column (1) be driven by a general trend of an increase in backers for projects with E-Commitment? To assess this possibility, in column (2), we use the number of backers (in log) from regions with low E-Awareness as the dependent variable. The alternative explanation predicts a similar result to that in column (1). The findings show that the coefficient on $E-\widehat{Commitment}$ in column (2) is statistically insignificant. This contrasts with the significant coefficient in column (1), suggesting that our findings in column (1) cannot be explained by the general trend of an increase in backers alone. Instead, they

[13] For each project with 10 or more backers, Kickstarter discloses the cities and states from which the backers come. See Bai, Chen, Martin, and Wan (2024) for a more detailed discussion of the threshold-based disclosure policy on Kickstarter. For these projects, we are thus able to calculate the number of backers who are from areas of high and low environmental awareness.

provide further support for the catering argument that creators make environment commitment to attract environmentally conscious backers.

6.1.2 New vs. Experienced Backers

Our next analysis addresses the question whether environmental commitment attracts marginal backers would otherwise have not participated in the platform.[14] Answering this question can further our understanding of why creators make E-Commitment. To this end, we separately regress the logged number of new backers and experienced backers on the instrumented values of *E-Commitment* and present these results in columns (3) and (4) of Panel A, Table 6 respectively. Column (3) shows a positive and statistically significant coefficient of 0.290 on *E-Commitment*, which suggests that environmental commitment leads to a 29% increase in the number of new backers. The negative and insignificant coefficient of -0.108 in column (4) implies environmental engagement does not have a measurable effect on experienced backers. Together, this evidence supports the argument that E-Commitment attracts marginal backers, suggesting that individuals who may not typically support green projects are drawn in by environment engagement efforts.

6.1.3 New Creators and High E-Awareness Creators

Based on the catering argument, a rational creator would adopt E-Commitment based on the backers' preferences rather than their own preferences, and this conjecture predicts that *E-Commitment* does not vary with creators' own environmental preferences. We examine this conjecture by analyzing the number of new creators and the number of high E-Awareness creators using similar classification methods described in Section 6.1.1 and 6.1.2.

We symmetrically examine the impact of environmental commitment for creators with different experiences and with different preferences by test the E-Commitment effect on new

[14] Experienced investors (backers) have been found to make better investment decisions in equity investment (Barber and Odean, 2000), bond investment (Blake, Elton, and Gruber, 1993), venture capital (Sorensen, 2007; Gompers, 1996), and crowdfunding (Ahlers, Cumming, Günther, and Schweizer, 2015).

creators and the number of creators from high E-Awareness areas, for which we Table 6 Panel B shows the results of both exercises. In both cases, the instrumented values of *E-Commitment* are not significantly associated with the *New Creator* indicator (column 1) nor *High E-Awareness Creator* indicator (column 2). This evidence collectively indicates that creators' environment commitment is unlikely to reflect their own green preferences, suggesting that they may be driven primarily by strategic considerations rather than their own intrinsic environmental values.

6.2 Project Characteristics: Local vs. National Projects

Thus far, our mechanism tests in Section 6.1 indicate that environmental commitments contribute to project success by drawing in new backers, especially those from areas with high environmental awareness. A natural question arises why not every creator makes environmental commitment. We focus our attention on the geographical attributes of Kickstarter projects and hypothesize that creators are more likely to take up the environmental engagement option if the project has a national appeal. The rationale is that for projects with a more localized appeal, the potential added value of a 'green' disclosure is quite limited. This is because the local culture and norm surrounding environmental issues are already well-established, reducing the information asymmetry between backers and creators. However, for projects with a more national appeal, providing environmental commitment can potentially attract backers from areas of high E-Awareness.

To test this conjecture, we separate projects in our sample into those that have a more local appeal and those with a more national appeal. To this end, we train BERT (Bidirectional Encoder Representations from Transformers) from Google to classify whether a Kickstarter project is likely to mainly attract local backers (i.e., backers from the creator's state) or tend to be national by drawing support from multiple states. Our training sample includes all projects, which are launched during the period of 2010-2016, and have 50 or more backers to better

decern the geographical dispersion of a project's backers. Specifically, in the training sample, projects that attract 5% or fewer backers from the creator's state are classified as being national; and those with 50% or more backers from the creator's state are classified as being local. The F1-score, assessing the model's overall performance in binary classification (being national vs localized projects), is 88.1%. This customed BERT classifier is then applied to each project's description in our sample period to predict whether it is likely to attract national support or not. *National Proj* is an indicator variable that takes the value of one for projects predicted to be national and 0 for projects predicted to be local.

We then estimate the following instrumental variable regression using 2SLS:

$$High\ E-aware\ Backers_{i,t} = \beta_0 + \beta_1\left(E-Commitment_{i,t}\right) + \beta_2\left(E-Commitment_{i,t} \times National\ Proj_{i,t}\right) + \theta_i X_{i,t} + Fixed\ Effects + \epsilon_{i,t}, \quad (4)$$

where all variables are defined analogously as in Equations (2) and (3). As suggested by Wooldridge (2002, p. 236) and Aghion, Howitt, Mayer-Foulkes (2005), the two endogenous variables (*E-Commitment* and *E-Commitment*×*National Proj*) are instrumented with their counterparts that are motivated by the exogenous introduction of E-policy (i.e., *E-Policy* and *E-Policy*×*National Proj*). We present the 1st stage results of this exercise in Table 7, Columns 1 and 2. Columns 3 and 4 report the 2nd stage results, where the dependent variable is evaluated by the number of *High E-Awareness Backers* (in log) or its ratio to the total number of backers of a project, respectively.

[Insert Table 7]

As shown in the 1st stage estimates (Column 1), we find a positive and statistically significant coefficient on the interaction term of *E-Policy* and *National Proj*. Specifically, the coefficient estimates on (*E- Policy* × *National-Proj*) suggests that national projects have a 31.9% higher likelihood of utilizing the E-Commitment option. This evidence provides support for

the above conjecture that creators of projects that appeal to a national audience are more likely to utilize the *E-Commitment* option that was made possible by E-Policy implementation.

Columns (3) and (4) contain the second-stage results of 2SLS, with the count number (in logarithm) and percentage of high E-Awareness backers as the outcome variables, respectively. Importantly, the coefficient on the interaction term, $E - \widehat{Commitment} \times National\text{-}Proj$, is positive and significant in both regressions, suggesting that the number and percentage of environmental backers are higher, by 11.8% and 10.3%, respectively, for national projects compared to local projects. Taken together, our evidence suggests projects' geographical appeal represents a binding constraint when creators decide on E-Commitment disclosures.

6.3 E-Commitment vs. E-Story

Our evidence so far suggests that creators benefit from improved funding outcomes by making an environmental commitment. It raises the question of whether they adopt this practice before Kickstarter's introduction of E-Policy and whether the effect on funding outcome is similar. Prior to the implementation of the E-Policy, creators could choose to voluntarily discuss their environmental engagement activities in the story section (i.e., project description) of a fund campaign page (E-Story). We argue, however, that E-Story is likely to be less effective in attracting environmentally conscious backers compared to E-Commitment for at least two reasons. First, as creators typically use the story section to provide details about who they are, what they are planning to make, and their budget, the E-Story section is often buried in the details. In contrast, following the category-level E-Policy introduction, creators have the option to convey their environmental engagement activities more prominently at the designated section, i.e., E-Commitment. Prior research (Huang, Nekrasov and Teoh 2018) indicates that the effectiveness of disclosure can be influenced by its location or placement, considering that individuals have limited attention. In this context, E-Commitment can potentially be more effective in capturing attention and generating positive funding outcomes. Second, as discussed

in Section 2, when Kickstarter launched E-Policy, the wide coverage in the crowdfunding community arguably raised awareness about the practice of environmental commitment among both creators and environmental conscious backers. Additionally, the partnership with the Environmental Defense Fund might have further supported creators interested in implementing sustainable practices, making it easier for them to incorporate environmental commitments into their projects. In this subsection, we analyze the relationships between *E-Story*, *E-Commitment*, and their impact on funding outcomes to examine the validity of our argument.

To gauge E-story, we construct an environment vocabulary list that is objective and directly related to environmental sustainability-oriented discussion on Kickstarter. Specifically, we combine all nonempty "Environmental commitments" sections (i.e., the corpus) and remove the boilerplate ("Visit our Environmental Resources Center to learn how Kickstarter encourages sustainable practices.") and various subsection titles ("Long-lasting design", "Reusability and recyclability", "Sustainable materials", "Environmentally friendly factories", "Sustainable Distribution", "Something else"). We then identify the top 40 most prevalent bigrams in the corpus. Figure 1 visualizes these bigrams. The variable *E-Story* is a dummy variable that takes the value of one indicating the presence of at least one of the top 40 environment bigrams in the "story" section of the Kickstarter project, and zero otherwise.

[Insert Table 8]

Before the introduction of E-Policy, 3.82% projects disclosed E-Story, which is much lower than the figure of 35% of projects disclosing *E-Commitment*. In addition, we show that the instrumented *E-Commitment* reduces *E-Story* by 12.2%, which can be seen in Table 8 Panel A. Thus, the evidence suggests that creators perceive *E-Commitment* superior to *E-Story* in communicating their commitment to environment engagement. To provide corroborative evidence, we further show in Panel B, Column 1, that, although both *E-Story* and *E-Commitment* have a positive association with funding outcomes, the coefficient magnitude for

the latter is much larger than the former, reinforcing that *E-Commitment* is more effective in attracting backers compared to *E-Story*. Lastly, as reported in Column 2, the interaction term, *E-Story*×*E-Policy*, is significantly negative, implying that after the introduction of E-Policy, the effectiveness of *E-Story* in attracting backers is further diminished, buttressing the role of *E-Commitment* in conveying environmental engagement to potential backers.

Overall, these results suggest that the dedicated venue of environmental engagement enabled by the platform-wide E-policy is more effective than previously allowed voluntary disclosure. While the exact reasons underlying such an effect could be a combination of multiple factors, it seems that salience and having dedicated space for declaring environmental commitment that draws backers' attention is an effective mechanism through which environmental initiatives can impact investor behavior.

6.4 Robustness Checks

In this section, we examine the robustness of our results to recent advancements in the empirical methodology literature that document several shortcomings of the staggered difference-in-differences approach. In the first subsection, we deal with issues arising from the staggered nature of these policy changes; in the second subsection, we examine the trends in our main outcome variables prior to the actual implementation of these platform-wide E-policy.

6.4.1 Addressing Issues with Staggered Difference-in-differences

A recent paper by Baker, Larcker, and Wang (2022) shows that DiD estimators with two-way fixed effects sometimes result in significant biases. They test various parameters and argue that using a stacked regression estimator could be optimal and more efficient. Therefore, in Table 9 Panel A, we re-estimate our baseline DiD regression using a stacked regression estimator. Essentially, this approach aggregates all the projects by a given category and year-month. The results in Table 9 show that the coefficient estimates for both *Success* and *Pledges*

are positive and significant, which suggests that our results do not seem to be an artifact of a choice of particular estimators.

[Insert Table 9]

6.4.2 Parallel Trend Analysis

One of the key identifying assumptions of the difference-in-differences methodology is the parallel trend assumption. We conduct a test to examine this assumption. Specifically, to check for pre-existing trends in success rates and pledge amounts, we replace *E-Policy* with the following nine variables: *E-Policy Year* (-4), *E-Policy Year* (-3), *E-Policy Year* (-2), *E-Policy Year* (-1), *E-Policy*, *E-Policy Year* (+1), *E-Policy Year* (+2), *E-Policy Year* (+3), *E-Policy Year* (4+).[15,16] *E-Policy Year* (-4), *E-Policy Year* (-3), *E-Policy Year* (-2), and *E-Policy Year* (-1) are especially important because their significance would suggest if there a significant relation between funding outcomes and *E-Policy* prior to its implementation.

The results in Table 9 Panel B show that the coefficients on *E-Policy Year* (-4), *E-Policy Year* (-3), *E-Policy Year* (-2), and *E-Policy Year* (-1) are all statistically insignificant and small in economic magnitude, indicating that there is no obvious trend of improving funding outcomes before the actual implementation of *E-Policy*. Further, the funding outcomes start to increase in the month of *E-Policy* introduction and this increase becomes more economically sizeable and stays statistically significant in the one year, two years, and three or more years post *E-Policy*. Overall, these findings suggest that our results do not suffer from reverse causality and the introduction pf E-Policy tends to be exogenous from project characteristics.

[15] The omitted group of projects that launched earlier than 4 years before E-Policy is thus the benchmark group.
[16] For example, *E-Policy Year* (-4) is an indicator variable that is set equal to one if a given project is launched 4 years prior to the actual *E-Policy* in that project category. *E-Policy Year* (+1) is an indicator variable that takes a value of one if a given project is launched 1 year after *E-Policy* in that project category. E-Policy is an indicator variable that takes a value of one if a given project is launched on the E-Policy month. Finally, *E-Policy Year* (4+) is an indicator variable that is set equal to one if a project is launched 4 or more years after *E-Policy.* The other dummy variables are defined analogously.

7. Conclusion

By leveraging the unique opportunity presented by Kickstarter's staggered introduction of E-Policy, we delve into the motivations behind creators' decision to make environmental commitment and backers' motivations to support green projects. Through the analysis of projects launched between 2016 and 2021, we employ a two-stage-least-squares approach to address the endogenous choice of environmental engagement by creators. We find strong evidence that environmental commitment by creators improves funding outcomes significantly. This suggests that backers are more inclined to support green projects. However, we do not find significant improvement in the likelihood of product delivery. Instead, we observe significant increases in the time it takes to deliver the product and the minimum pledges available to backers as a result of environmental engagement. These results suggest investors are willing to accept additional costs associated with E-Commitment and non-pecuniary, intangible motives primarily drive backer support for green projects on Kickstarter.

To further probe the motives for creators to make environmental commitment, we analyze backers' and creators' composition. We find that there is a significant increase in the number of backers from areas with high environmental consciousness and the number of new backers when creators make an environmental commitment. We, however, find no relation between creators' own environmental consciousness, measured by their geographical location, and their decision to make environment commitments. Additionally, when creators make environmental commitment, there is an increase in the number of environmental-related comments, which are largely positive in sentiment. Taken together, our findings support the notion that backers' environmental concerns play an important role in driving the demand for green projects, and creators respond to these preferences by making environmental commitments, even if they themselves do not possess strong green preferences.

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Appendix A: Variable definition

Crowding Funding Outcome	
Success	An indicator equals to one if the project is successfully funded.
Pledges	The total amount pledged to the project, scaled by the project goal.
Other Outcome Variables	
Delivery	We parse all updates issued in the year after the end of fundraising. Product delivery is an indicator variable, coded as one if one or more sentences in those subsequent updates do not contain negation ("not" or "n't") and have one or more of the following word stems, "ship", "sent", "send", "mail", and "receive". We collect the delivery status of a project from Jan. 2016 to Dec. 2021, one year before the end of our main sample period, to avoid truncation bias that may mis-identify the projects near the end of our sample period.
Delivery Time	The number of days between the end of the funding campaign and the first time when product delivery related words were observed in project updates (see the definition of Product Delivery above for details). The value is missing if no product delivery was observed. We collect the delivery time of a project from Jan. 2016 to Dec. 2021, one year before the end of our main sample period, to avoid truncation bias that may mis-identify the projects near the end of our sample period.
New and Experienced Backers	We code a backer to be a new backer when he/she only backed the focal project, and code a backer to be experienced backer when he/she has backed 1 or more other projects when backing the focal project. This measure is available when a project garners 10 or more backers to activate the disclosure of backer locations.
High E-Awareness Backers	We obtain monthly country- and state -level google search volume (SVI) for the phrase "environmental impact" over the period of January 2016 (the first month of our sample period) to September 2018 (the month before the first E-Policy treatment). If the average SVI of a state exceeds the national average, it is considered to have a high level of environmental awareness. E-Awareness Backer is the number of backers for a project who are from states of high environmental awareness. This measure is available when a project garners 10 or more backers to activate the disclosure of backer locations and is only available for U.S. backers.
Project and Creator Characteristics	
E-Commitment	An indicator variable that equals to one if the Kickstarter project provides an "Environmental commitments" section.
E-Comments	We first construct an environment vocabulary list that is objective and directly related to environmental sustainability-oriented discussion on Kickstarter. Specifically, we combine all nonempty "Environmental commitments" sections (i.e., the corpus) and remove the boilerplate ("Visit our Environmental Resources Center to learn how Kickstarter encourages sustainable practices.") and various section titles ("Long-lasting design", "Reusability and recyclability", "Sustainable materials", "Environmentally friendly factories", "Sustainable Distribution", "Something else"). We then identify the top 40 most prevalent bigrams in the corpus (shown in Figure 1). *E-Comments* is

	an indicator variable for the existence of environmental-related bigrams in the comment section.
Positive E-Comments	A binary variable that takes the value of one if the comment section contains environmental-related bigrams and the tone of comment section is positive, and zero otherwise. Comment tone is assessed by sentiment scores of the composite words, which are given by the VADER sentiment lexicon.
Goal	The target dollar amount of funding determined by the project creator.
Minimum Reward	The dollar amount of the minimum level rewards offered by the project creator.
Blurb Length	The length of the project blurb (i.e., the short project summary underneath the project title).
Horizon	The duration that the project is available for funding at Kickstarter.
Self-mention	An indicator equal to one if the project creator self-mentioned himself/herself in the project description.
Staff pick	An indicator equal to one if the project is staff picked.
FAQ	The number of frequently asked questions listed on the FAQ tab.
Updates	The number of updates provided during the duration that the project is available for funding.
Comments	The number of comments rendered during the duration that the project is available for funding.
Previous success	The total number of projects that have been successfully funded for a given project creator.
Other Projects	The number of other projects than the focal project created simultaneously by a given creator as listed on the creator's profile.
Gender	An indicator equals to one if the project creator is Female. It is inferred by matching the creator's name with the gender data published on https://github.com/lmullen/gender by Lincoln Mullen (2021).
National Project	We train BERT (Bidirectional Encoder Representations from Transformers) from Google to classify whether a Kickstarter project is likely to mainly attract local backers (i.e., backers from the creator's state) or tend to be national by drawing support from multiple states. Our training sample includes all projects, which are launched during the period of 2010-2016, and have 50 or more backers to better decern the geographical dispersion of a project's backers. Specifically, in the training sample, projects that attract 5% or fewer backers from the creator's state are classified as being national; and those with 50% or more backers from the creator's state are classified as being local. The F1-score, assessing the model's overall performance in binary classification (being national vs localized projects), is 88.1%. This customed BERT classifier is applied to each project in our sample period to predict whether it is likely to attract national support or not.
E-Story	We construct an environment vocabulary list that is objective and directly related to environmental sustainability-oriented discussion on Kickstarter. Specifically, we combine all nonempty "Environmental commitments" sections (i.e., the corpus) and remove the boilerplate ("Visit our Environmental Resources Center to learn how Kickstarter encourages sustainable practices.") and various section titles ("Long-lasting design", "Reusability and recyclability", "Sustainable materials", "Environmentally friendly factories", "Sustainable

	Distribution", "Something else"). We then identify the top 40 most prevalent bigrams in the corpus. Figure 1 visualizes these bigrams. The variable *E-story* is a dummy variable that takes the value of one indicating the presence of one or more top 40 environment bigrams in the "story" section of the Kickstarter project, and zero otherwise.
Category Characteristics	
E-Policy	An indicator variable is equal to one if Kickstarter provides guidelines and advises projects in a category to formally include Environmental Commitment on the Kickstarter page.

Appendix B: Structure of Hypotheses Development

		Backers	
	Hypothesis	Tangible	Intangible
Creators	Signaling	H2a, H3a	
	Catering		H2b, H3a
	Cheap talk		H2c, H3b

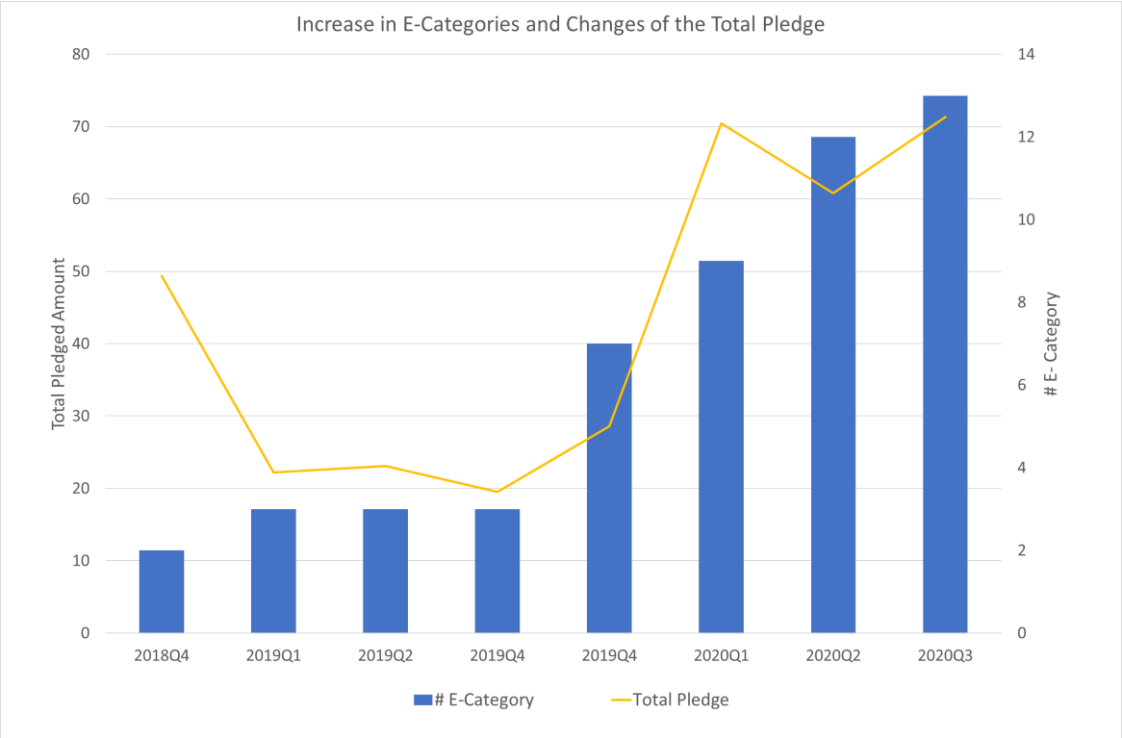
This table shows the structure of the hypotheses development for hypothesis 2 and 3. The columns represent the tangible and intangible motives of E-policy for backers, and the rows represent our signaling, catering and cheap talk argument of E-policy for creators. Each block in the table represents the corresponding testable hypotheses under each interaction of arguments.

Appendic C. E-Policy Implimentation Date of Kickstarter Project Categories

Project Category	E-Introduction Date
Design	23-Oct-2018
Technology	27-Nov-2018
Games	23-Jan-2019
Journalism	29-Jan-2019
Fashion	4-Jun-2019
Art	18-Dec-2019
Publishing	27-Dec-2019
Crafts	17-Jan-2020
Food	5-Feb-2020
Music	16-May-2020
Dance	5-Jun-2020
Photography	23-Jun-2020
Comics	31-Aug-2020

This table shows the date when Kickstarter provides guideline for environmental commitment (i.e., E-Policy) for each category of projects. Out of the 15 categories of projects, Theater and Film & Video categories have not implemented E-Policy and thus have no projects with E-Commitment in our sample period.

Figure 1. E- Policy implementation and the total pledged amount

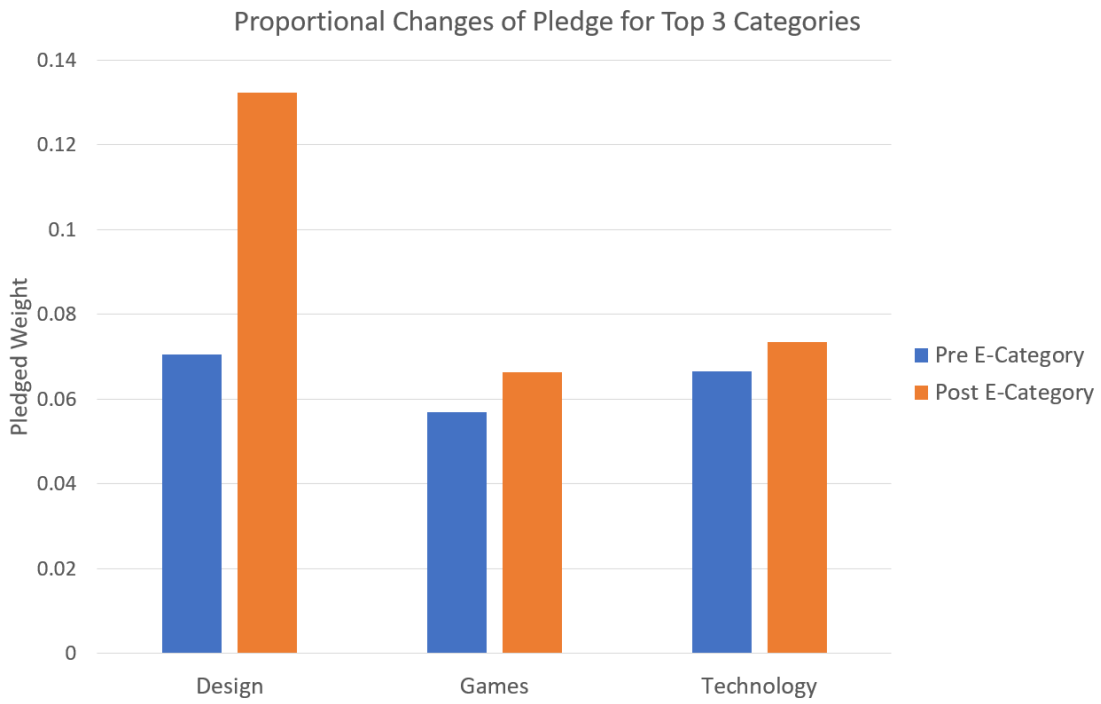


This figure reports the number of categories that implemented E-Policy (blue bars) and the total pledged amount across the Kickstarter platform (yellow line). The pledged amounts are in millions of US dollars.

Figure 2. Word Cloud of Environmental-Related Bigrams

This figure shows the word cloud of keywords (bigrams) presented in the collection of Kickstarter's "Environmental commitments" sections. The font size of each bigram represents its relative frequency of usage (and therefore relevance). Orange colored fonts highlight the top five most frequent used bigrams in the comment section.

Figure 3. Proportional Changes of Pledge Pre- and Post- E-Policy for Top 3 Categories



This figure reports the difference in the weight of the pledged amount for the top 3 categories of projects pre- and post- Kickstarter Platform environmental engagement policy. The top 3 categories of Kickstarter projects (design, games and technology) represent 72.5% of the total pledged amounts over our sample period.

Table 1 Summary Statistics

Variable	N	Mean	SD	P10	P25	Median	P75	P90
Success	173,874	0.272	0.445	0	0	0	1	1
Pledges	173,874	0.506	0.576	0	0.009	0.203	1.039	1.5
E-Policy	173,874	0.238	0.426	0	0	0	0	1
E-Commitment	173,874	0.077	0.266	0	0	0	0	0
E-Comments	83,569	0.037	0.19	0	0	0	0	0
Positive E-Comments	83,569	0.036	0.187	0	0	0	0	0
Goal (in dollars)	173,874	45177.71	903000	500	1500	5000	17115	50000
Minimum Reward (in dollars)	173,874	79.279	111.14	1	2	6	16	50
Blurb Length	173,874	16.323	5.825	7	12	18	21	23
Horizon (Days)	173,874	33.456	12.163	21	30	30	35	60
Self-Mention	173,874	0.057	0.232	0	0	0	0	0
Staff Pick	173,874	0.09	0.286	0	0	0	0	0
FAQ	173,874	0.814	2.847	0	0	0	0	2
Updates	173,874	6.681	11.19	0	0	2	9	19
Comments	173,874	61.035	1010.532	0	0	0	7	50
Previous Success	173,874	0.724	2.929	0	0	0	0	2
Other Projects	173,874	1.1	0.959	1	1	1	1	1
Gender	173,874	0.188	0.391	0	0	0	0	1
Delivery	40,698	0.723	0.447	0	0	1	1	1
Delivery Time	29,432	42.491	69.028	1	5	18	48	104
Num. New Backers	97,051	24.121	54.584	0	0	3	22	66
Num. Experienced Backers	97,051	55.788	122.972	0	0	8	47	160
Num. High E-Awareness Backers	80,291	14.724	60.849	0	1	4	13	34
Pct. High E-Awareness Backers	80,291	0.418	0.354	0	0.059	0.374	0.727	1
National Project	158,788	0.515	0.500	0	0	1	1	1
E-Story	173,874	0.061	0.239	0	0	0	0	1

This table presents the summary statistics of the variables used in the empirical analysis. Specifically, it presents the summary statistics of the main variables for 173,874 Kickstarter projects covers the sample period of Jan. 1, 2016 to Dec. 31, 2021; the indicator variable *E-Comments* covers 83,569 projects as the identification of whether a comment has environmental-related bigrams conditions on non-zero comments for the project, and the summary statistics for the additional variables used in the empirical analysis. These variables may cover different subsamples of our main dataset. The identification of whether a project has delivered its rewards, *Delivery* is only available for the projects that successfully meet the funding goal. *Delivery Time* is only available for the projects that successfully delivered the rewards. We collect the *Delivery* and *E-Comment* variables of a project one year before the end of our main sample, to avoid truncation bias that may mis-identify the projects near the end of our sample period. The number of new and experienced backers, as well as number and percentage of E-Awareness are only available when a project garners 10 or more backers to activate the disclosure of backer locations. E-Awareness backers' identification is only available for U.S. backers. The summary statistics in this table are based on the level of all variables while some of the variables in the analysis are in natural logarithms. All variables are defined in Appendix A.

Table 2 Correlation matrix of key variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) *Success*																
(2) *Pledges*	**0.91**															
(3) *E-Policy*	**0.11**	**0.13**														
(4) *E-Commitment*	**0.07**	**0.07**	**0.52**													
(5) *Goal*	**-0.02**	**-0.03**	**0.01**	**0.01**												
(6) *Reward*	**-0.01**	**-0.01**	0.00	0.00	**0.06**											
(7) *Blurb Length*	**-0.07**	**-0.08**	**-0.25**	**-0.10**	**-0.01**	0.00										
(8) *Horizon*	**-0.26**	**-0.29**	**0.02**	**0.03**	**0.03**	**0.01**	**0.02**									
(9) *Self-Mention*	**0.03**	**0.04**	**-0.04**	**-0.03**	0.00	0.00	**0.03**	0.00								
(10) *Staff Pick*	**0.19**	**0.24**	**0.02**	**-0.02**	0.00	0.00	0.00	**-0.06**	**0.04**							
(11) *Mean E-Story*	**0.03**	**0.04**	**0.06**	**0.13**	0.00	0.00	**-0.02**	0.00	**-0.01**	**0.03**						
(12) *FAQ*	**0.16**	**0.20**	**0.03**	**0.11**	**0.01**	0.00	**0.01**	0.01	0.00	**0.13**	**0.07**					
(13) *Updates*	**0.42**	**0.51**	**0.02**	**0.02**	**-0.01**	**-0.01**	**0.02**	**-0.11**	**0.02**	**0.23**	**0.01**	**0.30**				
(14) *Comments*	**0.08**	**0.09**	0.00	**0.01**	0.00	0.00	**0.01**	**-0.01**	0.00	**0.07**	0.00	**0.18**	**0.24**			
(15) *Previous Success*	**0.28**	**0.31**	**0.08**	**0.02**	**-0.01**	0.00	**-0.02**	**-0.19**	**-0.01**	**0.06**	**-0.02**	**0.03**	**0.20**	**0.07**		
(16) *Other Projects*	**0.04**	**0.04**	**-0.01**	**-0.01**	0.00	0.00	**-0.01**	**-0.07**	**-0.01**	0.00	**-0.01**	**0.03**	0.00	0.00	**0.14**	
(17) *Gender*	**-0.01**	**-0.01**	**-0.02**	**-0.05**	**-0.01**	**-0.01**	**-0.02**	**-0.02**	**-0.03**	0.00	0.00	**-0.06**	**-0.06**	**-0.02**	**-0.04**	**-0.01**

This table presents the pair-wise Pearson correlation matrix of the key variables for 173,874 Kickstarter projects covers the sample period of Jan. 1, 2016 to Dec. 31, 2021. The correlation coefficients that are statistically significant at 5% in two-tailed tests are in bold.

Table 3 Environmental Commitment and Funding Success

Panel A: DiD Estimation

VARIABLES	(1) Success	(2) Pledges
E-Policy	0.044***	0.029***
	(5.17)	(4.56)
Goal (in log)	-0.069***	-0.104***
	(-15.70)	(-18.90)
Minimum reward (in log)	0.010***	0.011***
	(8.84)	(7.72)
Blurb Length (in log)	-0.010***	-0.017***
	(-4.16)	(-6.47)
Horizon (in log)	-0.143***	-0.169***
	(-21.65)	(-31.32)
Self-Mention	0.026***	0.053***
	(7.77)	(13.31)
Staff Pick	0.084***	0.133***
	(4.71)	(7.16)
FAQ	0.005	0.004
	(1.50)	(1.03)
Updates	0.083***	0.118***
	(25.92)	(35.22)
Comments	0.084***	0.165***
	(14.43)	(26.65)
Previous Success	0.099***	0.123***
	(14.21)	(14.11)
Other Projects	-0.030***	-0.040***
	(-5.09)	(-7.01)
Gender	0.005*	0.009**
	(1.84)	(2.56)
Category, Year-month, and Location FE	Yes	Yes
Category, Year-month, and Location Clustering	Yes	Yes
Observations	173,874	173,874
Adj. R^2	0.448	0.648

Panel B: 2SLS Estimation

VARIABLES	(1) 1st Stage E-Commitment	(2) 2nd Stage Success	(3) 2nd Stage Pledges
E-Policy	0.332***		
	(4.56)		
$\boldsymbol{E-\widehat{Commitment}}$		0.132***	0.087***
		(5.17)	(4.56)
Goal (in log)	-0.000	-0.069***	-0.104***
	(-0.31)	(-15.70)	(-18.90)
Minimum reward (in log)	0.007***	0.009***	0.010***
	(4.18)	(7.75)	(7.20)
Blurb Length (in log)	0.019***	-0.012***	-0.019***
	(4.44)	(-4.81)	(-6.60)
Horizon (in log)	-0.005	-0.142***	-0.168***
	(-1.63)	(-21.58)	(-31.30)
Self-Mention	-0.002	0.027***	0.053***
	(-1.35)	(7.87)	(13.33)
Staff Pick	-0.020***	0.087***	0.134***
	(-4.61)	(4.85)	(7.25)
FAQ	0.017***	0.003	0.002
	(4.66)	(0.85)	(0.61)
Updates	0.003***	0.083***	0.118***
	(2.74)	(25.90)	(34.94)
Comments	-0.004**	0.084***	0.166***
	(-2.30)	(14.48)	(26.64)
Previous Success	-0.008**	0.100***	0.123***
	(-2.55)	(14.43)	(14.22)
Other Projects	-0.014**	-0.028***	-0.039***
	(-2.31)	(-4.81)	(-6.76)
Gender	0.003	0.005*	0.008**
	(1.36)	(1.70)	(2.50)
Category, Year-month, and Location FE	Yes	Yes	Yes
Category, Year-month, and Location clustering	Yes	Yes	Yes
Observations		173,874	173,874
Adj. R^2		0.404	0.605

This table presents the effect of instrumented *E-Commitment* and *E-Policy* on the main funding outcomes. Panel A presents the results of the DiD estimation of equation (2) and Panel B presents the results of the 2SLS estimation of equation (3). This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 4 Quality Implication of Environmental Commitment

VARIABLES	(1) Delivery
$\widehat{E-Commitment}$	0.013
	(0.49)
Pledged	0.065***
	(6.28)
Goal (in log)	-0.003
	(-1.32)
Minimum reward (in log)	-0.001
	(-0.34)
Blurb Length (in log)	-0.015***
	(-3.82)
Horizon (in log)	-0.036***
	(-7.40)
Self-Mention	0.010
	(1.35)
Staff Pick	0.009
	(1.34)
Past E-Story	-0.027***
	(-7.60)
FAQ	0.005
	(1.42)
Updates	0.233***
	(22.58)
Comments	0.024***
	(11.84)
Previous Success	-0.016**
	(-2.05)
Other Projects	0.026***
	(4.76)
Gender	0.065***
	(6.28)
Category, Year-month, and Location FE	Yes
Category, Year-month, and Location clustering	Yes
Observations	40,698
Adj. R^2	0.334

This table presents the effect of *E-Commitment* on the likelihood of project delivery using 2SLS estimation. This test is based on the subsample of projects that have successfully met the funding goal. We collect the delivery status for projects launched one year before the end of our main sample period, to avoid truncation bias that may misidentify the projects near the end of our sample period. This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5 Cost of Environmental Commitment

VARIABLES	(1) Log (Delivery Time in days)	(2) Log (Minimum Reward)	(3) E-Comments	(4) Positive E-Comments
$\widehat{E-Commitment}$	0.514**	0.538***	0.084***	0.085***
	(2.33)	(4.99)	(4.72)	(6.04)
Pledges	-0.227***			
	(-3.08)			
Goal (in log)	0.100***	0.110***	0.000	-0.000
	(13.50)	(16.68)	(0.11)	(-0.03)
Minimum reward (in log)	0.022***		-0.001	-0.001
	(4.87)		(-0.91)	(-1.32)
Blurb Length (in log)	-0.070***	0.035**	0.004***	0.003***
	(-3.31)	(2.08)	(2.86)	(3.01)
Horizon (in log)	0.062**	-0.031*	0.015***	0.014***
	(2.27)	(-1.87)	(3.39)	(9.24)
Self-Mention	0.027	-0.002	-0.007***	-0.007***
	(1.47)	(-0.18)	(-4.22)	(-4.51)
Staff Pick	0.056**	-0.030	0.000	0.000
	(2.31)	(-0.93)	(0.00)	(0.07)
FAQ	-0.081***	-0.056***	0.018***	0.018***
	(-5.05)	(-4.91)	(11.18)	(18.77)
Updates	-0.018**	0.049***	0.036***	0.036***
	(-2.01)	(4.40)	(7.13)	(45.24)
Comments	-0.164***	-0.155***	-0.008***	---
	(-6.87)	(-9.17)	(-7.74)	
Previous Success	0.031***	0.141***	-0.005***	-0.005***
	(2.91)	(15.05)	(-4.27)	(-4.34)
Other Projects	-0.030	0.074***	0.006***	0.006*
	(-0.54)	(4.17)	(2.65)	(1.96)
Gender	-0.006	-0.004	-0.001	-0.001
	(-0.21)	(-0.12)	(-1.24)	(-1.48)
Category, Year-month, and Location FE	Yes	Yes	Yes	Yes
Category, Year-month, and Location clustering	Yes	Yes	Yes	Yes
Observations	29,432	173,874	83,569	83,569
Adj. R^2	0.038	0.172	0.088	0.126

This table presents the effect of instrumented *E-Commitment* on the delivery time and the minimum reward using 2SLS estimation. Column (1) represents the result based on the subsample of projects that have successfully met the funding goals and delivered the rewards. We collect the delivery time for projects launched one year before the end of our sample period, to avoid truncation bias that may mis-identify the projects near the end of our sample period. This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 6 Environmental Commitment – Creators and Backers

Panel A. Backers

VARIABLES	(1) # High E-Awareness Backers (in log)	(2) # Low E-Awareness Backers (in log)	(3) # New Backers (in log)	(4) # Experienced Backers (in log)
$\widehat{E-Commitment}$	0.533***	0.170	0.290***	-0.108
	(6.89)	(1.14)	(2.88)	(-0.94)
Goal (in log)	0.144***	0.147***	0.319***	0.033
	(5.76)	(4.83)	(21.39)	(1.00)
Minimum reward (in log)	-0.008	-0.021***	-0.001	-0.013
	(-1.63)	(-4.23)	(-0.07)	(-1.04)
Blurb Length (in log)	-0.002	-0.013	0.046***	-0.045***
	(-0.13)	(-1.54)	(3.46)	(-4.37)
Horizon (in log)	-0.103***	-0.078***	-0.042	-0.086**
	(-2.64)	(-3.34)	(-1.50)	(-2.29)
Self-Mention	0.041***	0.063***	0.104***	0.135***
	(2.76)	(4.44)	(5.76)	(5.43)
Staff Pick	0.340***	0.322***	0.255***	0.206***
	(10.68)	(8.86)	(8.49)	(3.43)
FAQ	0.046***	0.055***	0.106***	-0.257***
	(5.18)	(5.74)	(11.49)	(-6.06)
Updates	0.137***	0.162***	0.147***	0.149***
	(17.08)	(13.51)	(16.56)	(4.86)
Comments	0.103***	0.129***	0.266***	0.389***
	(6.13)	(7.71)	(16.71)	(26.59)
Previous Success	0.041**	0.035	-0.347***	0.048
	(2.38)	(1.65)	(-16.94)	(0.81)
Other Projects	-0.123**	-0.171***	-0.553***	0.085**

	(-2.16)	(-3.23)	(-8.47)	(1.98)
Gender	0.074***	0.099***	0.134***	-0.028
	(9.40)	(7.19)	(6.17)	(-1.47)
Category, Year-month, Location FE	Yes	Yes	Yes	Yes
Category, Year-month, Location clustering	Yes	Yes	Yes	Yes
Observations	80,291	80,291	97,051	97,051
Adj. R^2	0.406	0.428	0.380	0.168

Panel B. Creators

VARIABLES	(1) New Creator	(2) High E-Awareness Creator
$\widehat{E-Commitment}$	0.006	-0.014
	(0.24)	(-0.35)
Goal (in log)	-0.027***	0.002**
	(-13.54)	(2.20)
Minimum reward (in log)	0.011***	0.002
	(5.10)	(1.45)
Blurb Length (in log)	-0.008**	0.010**
	(-2.31)	(2.29)
Horizon (in log)	-0.136***	-0.016***
	(-9.34)	(-3.09)
Self-Mention	-0.008	0.005
	(-1.26)	(0.76)
Staff Pick	0.021	0.033***
	(1.41)	(5.91)
FAQ	-0.043***	0.003
	(-10.50)	(1.18)
Updates	0.061***	0.000
	(12.62)	(0.24)
Comments	0.042***	0.006***
	(9.39)	(3.48)
Previous Success	--	--
Other Projects	0.323***	-0.024**
	(33.18)	(-2.45)
Gender	-0.015***	0.002
	(-4.21)	(0.50)
Category, Year-month, Location FE	Yes	Yes
Category, Year-month, Location clustering	Yes	Yes
Observations	173,874	105,000
Adj. R^2	0.281	0.117

This table presents the effect of the instrumented *E-Commitment* on the attributes of backers and creators using 2SLS estimation. Panel A presents the 2SLS estimation of the *E-Commitment* effect on the backers' attributes and Panel B presents the 2SLS estimation of the *E-Commitment* effect on the creators' attributes. The number of new and experienced backers, as well as number and percentage of E-Awareness Backers are only available when a project garners 10 or more backers to activate the disclosure of backer locations. E-Awareness backers and creators are only available for U.S. backers. *E-Comments* covers 83,569 projects as the identification of whether a comment has environmental-related bigrams conditions on non-zero comments for the project. This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7 Local vs. National Projects

	National Projects Classified by BERT			
	1st stage	1st stage	2nd stage	2nd stage
	(1)	(2)	(3)	(4)
	E-Commitments	*E-Commitments* × *National-Proj*	# High E-awareness backers (in log)	% High E-awareness backers
VARIABLES				
E-Policy	0.147***	0.0182		
	(2.75)	(0.55)		
E- Policy × *National-Proj*	0.319***	0.413***		
	(5.18)	(5.63)		
$E-\widehat{Commitment}$			0.460***	0.071***
			(5.75)	(3.18)
$E-\widehat{Commitment}$ × *National-Proj*			0.118***	0.103**
			(3.05)	(2.51)
National-Proj	0.030*	0.039**	0.044***	0.008**
	(1.85)	(2.28)	(4.03)	(2.52)
Other controls	Yes	Yes	Yes	Yes
Category, Year-month, Location FE	Yes	Yes	Yes	Yes
Category, Year-month, Location clustering	Yes	Yes	Yes	Yes
Observations			80,291	80,291
Adj R^2			0.404	0.325

Columns 1 and 2 present the 1st stage regression results that shed light on the interaction effect of the *E-Policy* and *National-Proj* on the likelihood of the project making E-Commitment. Columns 3 and 4 report the second stage results that examine the instrumented *E-Commitment* and *National-Proj* on the number and percentage of E-Awareness Backers. Specifically, the two endogenous variables (*E-Commitment* and *E-Commitment*×*National Proj*) are instrumented by their counterparts that are motivated by the exogenous introduction of E-policy (i.e., *E-Policy* and *E-Policy*×*National Proj*). To appraise a project's national appeal (or lack of that), we train BERT (Bidirectional Encoder Representations from Transformers) from Google to classify whether a Kickstarter project is likely to mainly attract local backers (i.e., backers from the creator's state) or tend to be national by drawing support from multiple states. Our training sample includes all projects, which are launched during the period of 2010-2016, and have 50 or more backers to better decern the geographical dispersion of a project's backers. Specifically, in the training sample, projects that attract 5% or fewer backers from the creator's state are classified as being national; and those with 50% or more backers from the creator's state are classified as being local. This customed BERT classifier is applied to each project in our sample period to predict whether it is likely to attract national support or not. *National Proj* is an indicator variable that takes the value of 1 for predicted national projects and 0 for predicted localized state projects. This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 8. E-Story

Panel A

VARIABLES	(1) E-story
$E - \widehat{Commitment}$	-0.122** (-2.40)
Equality of coefficients (F test statistic)	
Other controls	Yes
Category, Year-month, and Location FE	Yes
Category, Year-month, and Location clustering	Yes
Observations	173,874
Adj. R^2	0.064

Panel B

VARIABLES	(1) Success	(2) Pledges
$E - Commitment$	0.047***	0.032***
	(3.50)	(3.11)
E-Story	0.010**	0.023***
	(2.07)	(2.97)
E-Policy	0.004	0.005
	(1.23)	(1.25)
E-Story × *E-Policy*	-0.059***	-0.052***
	(-3.42)	(-2.90)
Equality of coefficients (*E-Commitment* vs *E-story*; F test)	6.81***	3.48**
Other controls	Yes	Yes
Category, Year-month, and Location FE	Yes	Yes
Category, Year-month, and Location clustering	Yes	Yes
Observations	173,874	173,874
Adj. R^2	0.449	0.648

This table presents the relationship between *E-Commitment* and *E-Story*, as well as the effect of *E-Commitment* dominates that of the *E-Story* after the E-Policy. Panel A examines the relationship between *E-Commitment* and *E-Story*, where *E-Commitment* is instrumented by *E-Policy*. Panel B examines the diminished effect of *E-Story* on favorable funding outcome after *E-Policy*. This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 9 Robustness Tests

Panel A. Stacked Regression

VARIABLES	(1) Success	(2) Pledges
E- Policy	0.055***	0.057***
	(3.507)	(3.723)
Goal (in log)	-0.096***	-0.132***
	(-14.032)	(-26.746)
Minimum reward (in log)	0.016	0.013
	(1.635)	(1.439)
Blurb Length (in log)	-0.088***	-0.116***
	(-3.244)	(-5.666)
Horizon (in log)	-0.275***	-0.227***
	(-8.614)	(-9.301)
Self-Mention	0.022	0.026
	(0.600)	(0.550)
Staff Pick	0.105***	0.191***
	(5.767)	(9.689)
FAQ	0.146***	0.121***
	(5.735)	(4.823)
Updates	0.076***	0.107***
	(4.446)	(6.848)
Comments	0.073***	0.185***
	(6.298)	(15.394)
Previous Success	0.223***	0.206***
	(11.137)	(10.522)
Other Projects	-0.038	-0.007
	(-1.390)	(-0.192)
Gender	-0.065***	-0.031**
	(-3.063)	(-2.082)
Category, Year-month, Location FE	Yes	Yes
Category, Year-month, Location clustering	Yes	Yes
Observations	7,697	7,697
Adj. R^2	0.846	0.936

This table presents category-month level stacked regression where we aggregate all project level data to category and year-month. As a project falls into either the treated group or the control group, we first create individual stacks of observations from a month that receive treatment in the same time period or not receiving treatment, and then append these stacks together and estimate the treatment effect of E-Policy. This specification is on the category level and controls for the category fixed effects, the standard errors are clustered by category. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel B. Parallel Trend Analysis

	(1)	(2)
VARIABLES	Success	Pledges
E-Policy Year (-4)	-0.016	-0.019
	(-0.968)	(-1.240)
E-Policy Year (-3)	0.003	0.014
	(0.161)	(0.807)
E-Policy Year (-2)	-0.018	0.008
	(-0.930)	(0.437)
E-Policy Year (-1)	-0.004	0.026
	(-0.292)	(1.793)
E-Policy Year	0.042*	0.079**
	(2.067)	(3.808)
E-Policy Year (+1)	0.048**	0.086***
	(2.603)	(4.509)
E-Policy Year (+2)	0.037	0.079*
	(1.183)	(2.381)
E-Policy Year (+3)	0.068**	0.127***
	(3.438)	(6.254)
E-Policy Year (4+)	0.435***	0.652***
	(6.877)	(8.200)
Other Control Variables	Yes	Yes
Category, Year-month, Location FE	Yes	Yes
Category, Year-month, Location clustering	Yes	Yes
Observations	173,874	173,874
Adj. R^2	0.444	0.645

This table presents the results of the test to examine the parallel trend assumptions. The variables of interest are a series of indicator variables, *E-Policy Year* -1 to -4, *E-Policy Year* and *E-Policy Year* 1 to 4 as well as an indicator variable, *E-Policy Year (4+)*. For each *E-Policy Year* -n, the indicator variable equals to 1 if the project was announced $n \times 12$ months before the *E-Policy* date for the category and 0 otherwise, and for each *E-Policy Year* +n, the indicator variables equal to 1 if the project was announced $n \times 12$ months after the *E-policy* date for the category and 0 otherwise. *E-Policy Year* (4+) equals to 1 if the project was announced more than 48 months after the *E-Policy* date for the category and 0 otherwise. This specification controls for the project category, launching year-month and creator's location fixed effects, and the standard errors are clustered by category, year-month and creator's location. The *t* values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.