

# A Kick or a start? Gender disparity evidence of winning a Kickstarter on future funding

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## Abstract

This study identifies the causal effect of acquiring funding on Kickstarter, which has become a standard method for “new” entrepreneurs to obtain financial support. Subsequently, it studies gender-based heterogeneity in acquiring funding for future outcomes for “first-time” entrepreneurs. The study employs a regression discontinuity design to address the issue of non-random assignment of an entrepreneur’s success in the first campaign. According to the findings, completing the first Kickstarter campaign increased the first Kickstarter campaign, resulting in an increase of 32% compared to the mean funding received after the first campaign. For female entrepreneurs, completing their first project yields an increase of \$2,961 in raising funds via crowdfunding, as opposed to their female counterparts who fail to finish their campaigns. However, males see a more significant increase of \$4,018, which is a 40% increase compared to the mean funds raised in the future for all entrepreneurs. It is statistically different from their female counterparts for a sample subset. This study adds to the literature on the determinants of successful entrepreneurs and highlights the need for further research to understand and address gender disparities in entrepreneurship.

*Keywords: Entrepreneurship, Economics of Gender, Online Crowdfunding*

# 1 Introduction

One of the central focuses in the literature on Entrepreneurial Finance (EF) pertains to the role of gender identity in determining entrepreneurial success and discrimination. Klapper and Parker (2011) summarize the vast literature understanding the relationship between entrepreneurship and gender and identify significant gender gaps in multiple industries. The issue of gender disparity in entrepreneurship has garnered considerable attention in recent years. Numerous studies have also underscored women entrepreneurs’ difficulties securing the necessary funding and resources for their businesses to thrive across developed and developing countries (Minniti, 2009; OECD, 2016). However, gender disparity has not received sufficient attention in crowdfunding in contrast to other forms of financing, such as debt and angel financing. Therefore, it is critical to comprehend and emphasize gender-based inequalities in various forms of funding acquisition, particularly in online crowdfunding, which has become the alternative approach to raising funds among emerging entrepreneurs (Barnett, 2015).

Online crowdfunding has become a primary method for emerging entrepreneurs to secure financial support for their products and services (Belleflamme et al., 2014). This approach offers several advantages, including reduced entry barriers, increased exposure, and lower risk of debt (Ordanini et al., 2011; Belleflamme et al., 2014; Block et al., 2018). In 2020, crowdfunding platforms like Kickstarter, IndieGoGo, GoFundMe, and StartEngine raised over \$74 billion in North America alone (Statista, 2023), underscoring the widespread use of crowdfunding by entrepreneurs to obtain capital for innovative projects. However, research on how the funds acquired by entrepreneurs through these platforms have a causal effect on the future success of these entrepreneurs remains unclear.

As a crowdfunding platform, Kickstarter offers a way for profit-seeking entrepreneurs and startups to assess the market viability of their ideas with minimal financial risk, utilizing their “all-or-nothing” funding approach (Mollick, 2014). This approach necessitates that projects (called campaigns on Kickstarter) achieve their funding objective within a predetermined time frame; otherwise, no funds are gathered from the supporters. Nevertheless, this model also presents an opportunity to leverage the variation in funding success and failure, from those who fell short by a few dollars to those who just met their goal. This study capitalizes on this variation and assesses the impact of completing an online crowdfunding campaign on an entrepreneur’s ability to secure future funding.

Estimating the causal impact of completing an initial funding round on the acquisition of future funding presents a challenge due to entrepreneurs’ non-random assignment of first projects. The unobserved abilities of entrepreneurs can affect their capacity to secure additional funding. A regression discontinuity (RD) design that leverages a sharp discontinuity of dollars pledged by backers in entrepreneurs’ campaigns is utilized to address this issue. This design allows for examining the impact of achieving success in the first Kickstarter project on the ability to generate funding for future ventures. Moreover, this study characterizes the effects of gender on the capacity to raise funding, revealing heterogeneity in funding acquisition abilities.

Analyzing entrepreneurs just above and below the threshold of success reveals that completing the first Kickstarter campaign results in an \$3,185 increase in future funding, 32% of the mean funding entrepreneurs obtained after their first campaign. These statistical results remain robust to bandwidth and kernel selection methods. Moreover, incomplete Kickstarter

campaigns for female entrepreneurs limit their ability to acquire additional funding (\$2,756.56 compared to \$3,066.24 for men) relative to other female entrepreneurs who managed to obtain funding by just over \$500 of their funding goals. The difference between the male and female estimates is statistically significant for a higher set of bandwidths. Furthermore, the top (and bottom 10) categories with the highest (and lowest) differences in estimates provide evidence against the notion that differences in category choices between males and females are the reason for the observed disparities.

## 2 Literature Review

This research adds to the current body of literature focusing on the factors that impact entrepreneurial success. Among these factors, funding is particularly crucial for small and medium-sized enterprises (SMEs). These SMEs often encounter significant credit constraints, which can, in turn, affect the ability of entrepreneurs to enter a specific market (Aghion et al., 2014). On an entrepreneurial level, perseverance or the perception of persistence has proven valuable for entrepreneurs aiming for success in their business endeavors (Gompers et al., 2010). Astebro et al. (2014) have extensively examined the individual determinants of entrepreneurship using an expected utility framework. Their analysis indicates that the expected returns from entrepreneurial activities show significant variance and tend to remain moderate. The high variation in expected returns is attributed to a high failure rate of startups, and the rarity of exceptionally successful ones primarily contributes to poor success outcomes. With the growing interest in understanding the drivers of entrepreneurial success, this study offers insights through crowdfunding and sheds light on the financial gains entrepreneurs reap following initial success.

In the context of entrepreneurial success, the pivotal role of crowdfunding platforms like Kickstarter has garnered increasing attention in recent years because of its appeal as an alternative to traditional forms of funding (Hervé and Schwienbacher, 2018). Prior literature has focused on the immediate outcomes of Kickstarter campaigns, such as financial and qualitative well-being of entrepreneurs' startups (Schwienbacher and Larralde, 2012) and backer support (Kuppuswamy and Bayus, 2017), and the characteristics of what makes a Kickstarter successful and unsuccessful (Ullah and Zhou, 2020; Gafni et al., 2020; Wang et al., 2023). However, a notable gap exists in understanding the long-term implications of Kickstarter's success. This study addresses this gap by investigating the causal effect of winning a Kickstarter campaign on entrepreneurs' ability to secure subsequent funding. By delving into the dynamic relationship between Kickstarter's success and future financial backing, this research aims to contribute valuable insights to the broader discourse on entrepreneurial success and funding strategies in the contemporary entrepreneurial landscape.

Gender disparities in the workforce have widened as a result of unconventional human capital factors, such as differences in occupation and industry based on gender (Blau and Kahn, 2017). In entrepreneurship, female entrepreneurs have encountered significant challenges in obtaining business loans, often facing higher interest rates. These discrepancies have become increasingly apparent even in societies with greater gender equality (Malmström et al., 2023). The primary issue hindering female entrepreneurs from launching new ventures is the need for more access to credit. Numerous studies have emphasized women entrepreneurs' challenges

when seeking crucial financing and resources for their businesses. For example, Coleman (2012) discovered that women entrepreneurs are less likely than their male counterparts to secure external funding, such as venture capital and angel investments. Other research has examined the perceived financial barriers that disproportionately affect women, leading them to become discouraged borrowers (Roper and Scott, 2009; Freel et al., 2012).

Success in entrepreneurship has been explored through the lens of gender, in which women are significantly underrepresented. Numerous studies have aimed to delve into the root causes behind this gender gap (Guzman and Kacperczyk, 2019; Markussen and Røed, 2017; McGrath et al., 2022). Existing literature indicates that variation in self-perceived capabilities (Hisrich and Brush, 1984), risk aversion (Jianakoplos and Bernasek, 1998), and gender-related disparities in STEM representation, along with prejudiced evaluations, have all contributed to this disparity (Thébaud and Charles, 2018; Ding et al., 2006; Ridgeway and Correll, 2004). However, understanding the extent of these disparities and inequalities in the digital market requires evidence through causal estimates, which is the primary goal of this study.

Gender disparities are also prevalent in other entrepreneurial areas, such as patenting, where women’s patents have a lower technological impact than men’s (Sugimoto et al., 2015). Women are also substantially more hindered than men in acquiring funding through venture capitalists due to gendered biases and poor signals on growth potential (Guzman and Kacperczyk, 2019). Similarly, in angel financing, women tend to receive less capital and provide higher equity for their businesses compared to their male counterparts (Poczter and Shapsis, 2018). Nevertheless, there has also been evidence of women having a higher likelihood of success at crowdfunding than men (Greenberg and Mollick, 2017; Younkin and Kuppuswamy, 2018). These contradictory findings highlight the persistent gender disparities in various aspects of entrepreneurship and the need for targeted interventions to address them.

This study has three significant contributions. First, it presents long-term causal estimates of the impact of acquiring crowdfunding on the future projects of entrepreneurs. Second, it offers additional evidence of the spillover effects of a Kickstarter campaign on other campaigns, demonstrating the recursive nature of legitimacy (Soublière and Gehman, 2020; Huang et al., 2022). Finally, the research provides evidence of the disparities women face in online crowdfunding, including lower representation on the platform and less ability to raise funds compared to men.

### **3 Background on Kickstarter**

Kickstarter, founded in 2009, is a popular crowdfunding platform that enables entrepreneurs and creatives to raise funds for their products and services. It operates on an “all-or-nothing” funding model, meaning that campaigns must reach their fundraising goal for the project to receive any funding. Under this model, entrepreneurs or creatives who launch a crowdfunding campaign on Kickstarter set a fundraising goal they must meet within a specified time frame, typically 30 to 60 days. If the campaign does not meet its goal by the deadline, it will not receive any funding, and backers will not be charged for their pledges.

The all-or-nothing model on Kickstarter is a win-win situation for backers and entrepreneurs. It safeguards backers by ensuring that entrepreneurs or creatives who receive

funding are committed to delivering their products or services as promised. Simultaneously, it motivates entrepreneurs or creatives to set realistic fundraising goals and work hard to promote their campaigns, as they understand that meeting their goals is the only way to secure funding.

Launching a campaign on Kickstarter is straightforward. Entrepreneurs start by creating a project page with a video explaining their product or service, a project description, and a set of rewards for backers. They then set the fundraising goal and campaign deadline. Kickstarter also assists entrepreneurs in determining the correct payout based on the taxes in their state or country of origin. The campaign duration is limited to a maximum of 60 days, ensuring a sense of urgency and momentum.

Kickstarter successfully impacts projects and entrepreneurs worldwide because it provides a platform for entrepreneurs to test their products/services before launching them publicly. The platform allows for demand estimation for entrepreneurs, which helps ensure the product's success. Moreover, the all-or-nothing model creates a sense of urgency among backers, who are more likely to pledge their support early in the campaign when they know the project's success is uncertain. The Kickstarter's strategy can build momentum for the campaign and attract more backers, increasing the chances of success.

## 4 Data

This research utilizes project-level data obtained from Kickstarter. The data is gathered using a web scraper executed monthly and publicly available from the developers on Robots (2023). It includes information on project status (active, completed, failed, canceled, or suspended), detailed creator-level project data such as creator and project names, product funding information, and launch and deadline dates. Each Kickstarter project identifies the entrepreneurs involved by linking them through their unique person ID. I also track subsequent projects created to obtain the outcome variable and future funding after the initial campaign. Future funding after the initial campaign sums the dollars raised in future Kickstarter campaigns if and only if the future campaign is successful.<sup>1</sup>

The base sample for this study consists of all the Kickstarter campaigns from April 2014 through September 2022, a total of 349,158 unique first-time Kickstarter campaigns. To ensure accurate measurement of bandwidths, approximately 5% of the cases with total funding exceeding \$100,000 or falling below \$100,000 are excluded, resulting in a sample of 333,471 campaigns.<sup>2</sup> Additionally, 0.44% campaigns flagged as suspended are also dropped as they have the potential to be involved in misrepresentation of support, among other reasons (Kickstarter Help Center, 2023). The final sample includes campaigns with outcomes of

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<sup>1</sup>This particular imputed variable offers numerous advantages over the success rates following the initial Kickstarter campaign. According to Schwienbacher and Larralde (2012), these success rates are deemed an unreliable predictor of an entrepreneur's future success for the following reasons: (1) The metric encompasses a range of strategic and execution elements that contribute to a project's success; (2) It takes into consideration the cumulative impact of an entrepreneur's Kickstarter campaigns, acknowledging the potential influence of cultivating a loyal customer base and the development of skills through multiple campaigns.

<sup>2</sup>Excluding outliers is crucial for accurately estimating bandwidths, as highlighted by Calonico et al. (2014) and Imbens and Kalyanaraman (2012). A robustness check that includes the outliers and maintains the original set of bandwidths demonstrates minimal statistical impact on the study's findings.

success, failure, or cancellation when calculating the imputed variable, as all other statuses indicate ongoing Kickstarter campaigns.

A gender identification algorithm is utilized, which analyzes creators’ first names, taking into account various possibilities and yielding both a gender label and a probability score to indicate the likelihood of the determination. In the case of uncommon first names, the algorithm assigns the gender as “mostly male” or “mostly female.” In situations where the first name is unisex, the algorithm assigns the gender as androgynous or “Andy.” Data points without a first name or those that do not fit into the aforementioned categories are categorized as firms. To ensure the accuracy and dependability of the gender classification, semi-identified genders are not considered when analyzing gender differences. Table 1 displays statistics generated by the algorithm, indicating that the algorithm identifies fewer females than males, regardless of the treatment. Panel A presents data for all individuals who did not complete their first Kickstarter, while Panel B provides statistics on individuals who completed it.

The table encompasses several notable findings. Firstly, in Panel A, the dollar amounts are negative, indicating unsuccessful Kickstarter campaigns. The larger amounts suggest that, on average, entrepreneurs who face initial failure do so with a considerable deviation from their pledged goal amounts. Secondly, regardless of the treatment, male and female participants demonstrate distinct campaign goals and receive varying funding levels. Thirdly, male entrepreneurs achieve an average number of backers that is 29.2% higher than their female counterparts when they complete their first Kickstarter. In contrast, the difference between male and female backers is negligible when both fail their first Kickstarter campaign. Lastly, the total number of women represented in the data is significantly lower than that of men, which aligns with the findings of Gafni et al. (2020) and Elitzur and Solodoha (2021).

Table 1: Statistics by Gender

| <b>Panel A: Failed First Kickstarter</b>    |          |                                |                |           |        |        |
|---|----------|--------------------------------|----------------|-----------|--------|--------|
| Gender                                      | US based | Dollars To Goal Cutoff (in \$) | Amount Pledged | Backers   | Obs.   |        |
| Andy  | 0.73     | -13,643.02                     | 14,802.13      | 1,159.11  | 13.48  | 1,879  |
| Female                                      | 0.74     | -11,685.68                     | 12,636.12      | 950.44    | 11.92  | 31,479 |
| Male  | 0.73     | -14,781.22                     | 15,698.49      | 917.27    | 11.87  | 89,921 |
| Mostly Female                               | 0.8      | -12,598.46                     | 13,775.31      | 1,176.85  | 14.33  | 6,203  |
| Mostly Male                                 | 0.78     | -13,623.6                      | 14,580.35      | 956.75    | 12.05  | 8,423  |
| Firms                                       | 0.7      | -15,568.53                     | 17,295.21      | 1,726.68  | 19.92  | 50,465 |
| <b>Panel B: Completed First Kickstarter</b> |          |                                |                |           |        |        |
| Andy  | 0.69     | 3,728.57                       | 8,183.02       | 11,911.58 | 143.52 | 1,755  |
| Female                                      | 0.71     | 2,144.59                       | 7,689.7        | 9,834.29  | 110.3  | 30,655 |
| Male  | 0.74     | 3,387.9                        | 8,599.19       | 11,987.09 | 142.14 | 51,532 |
| Mostly Female                               | 0.79     | 2,788.96                       | 8,544.68       | 11,333.65 | 135.39 | 6,902  |
| Mostly Male                                 | 0.79     | 3,027.29                       | 7,127.04       | 10,154.32 | 139.1  | 5,615  |
| Firms                                       | 0.66     | 6,335.68                       | 12,406.96      | 18,742.63 | 204.75 | 48,642 |

Values are averages rounded to the nearest second decimal place. Outliers are excluded from these summary statistics.

## 5 Empirical Strategy

### 5.1 Identification

The primary objective of this research design is to examine whether discontinuities within the “all-or-nothing” framework of Kickstarter align with similar discontinuities in other outcomes. To support the discontinuity framework, which necessitates a running variable, I use the creators’ initial project as a basis for creating the running variable known as “dollars remaining to reach the goal.” This variable calculates the difference between the total dollars raised and the goal the creator set at the end of the campaign duration. This running variable generates a sharp discontinuity at zero, where creators to the left of the discontinuity do not secure funding for their first Kickstarter project, while creators on the right do. Apart from the treatment of receiving funding for the first campaign, creators on both sides of the discontinuity are presumed to exhibit similarity, thus enabling a comparison of the creators’ future outcomes.

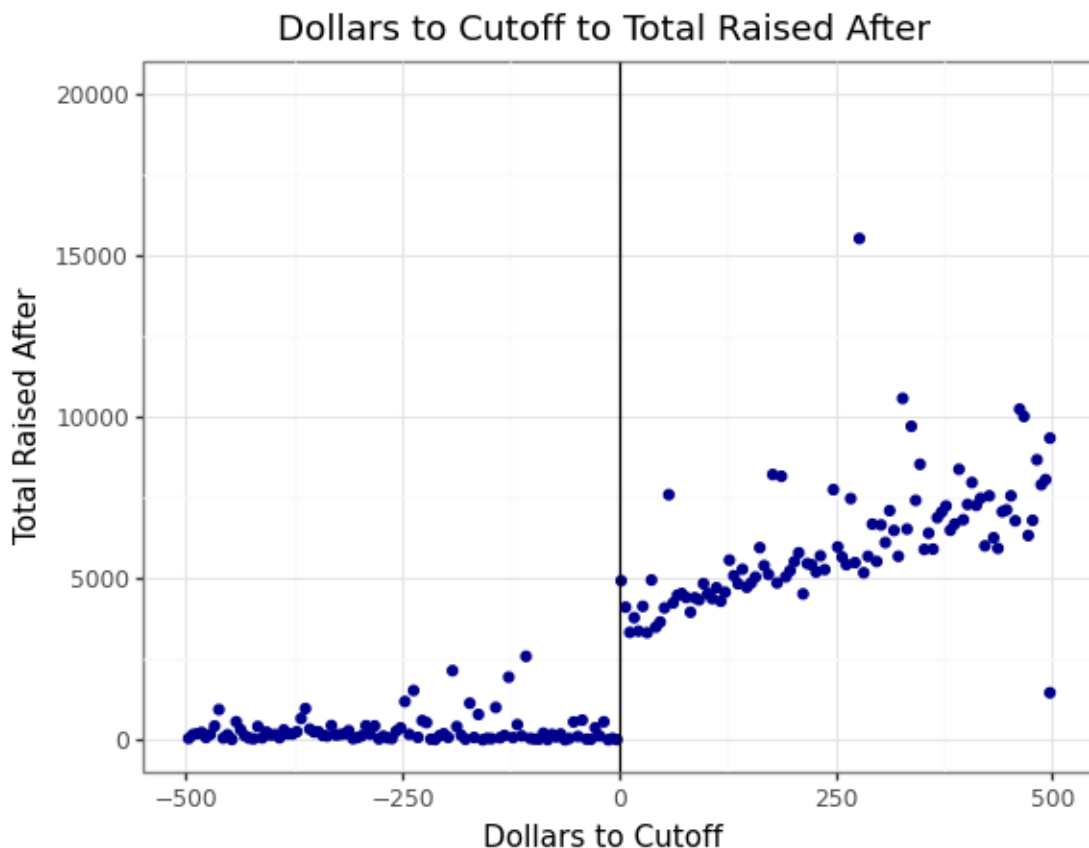


Figure 1: The figure emphasizes the discontinuity of receiving funding in an entrepreneur’s first campaign on total dollars raised after. The data is divided into 100 bins with an average bin length of \$5. Data is weighted based on an Epanechnikov kernel.

The chart labeled as Figure 1 depicts the total funds raised by entrepreneurs in all campaigns, except the first one, within a \$500 range. It also showcases the proximity of

their first project to reaching its funding goal. Entrepreneurs positioned to the right of the cutoff are eligible for funding based on the pledges received for their initial project. In contrast, entrepreneurs positioned to the left failed to complete their first campaign and are ineligible to receive funding. Moreover, the graph displays a significant disparity in funding accumulation after the first campaign, with notably less funding on the left side of the cutoff compared to the right.

We can utilize a “sharp” regression discontinuity (RD) to estimate the impact of completing a Kickstarter campaign for individuals who are close to the funding threshold. Since the treatment can be perfectly predicted by the running variable, a Local Average Treatment Effect (LATE) can be estimated for entrepreneurs that are near the threshold.<sup>3</sup> The research focuses on estimating the impact of completing a Kickstarter campaign for entrepreneurs near the funding threshold due to limited information on their initial project revenues.

It is important to assume continuity in explanatory variables near the threshold to assess the causal effects of the successful completion of initial Kickstarter campaigns. This assumption seems reasonable, as entrepreneurs just above and below the threshold exhibit similarity in all aspects except for the treatment variable. To verify continuity in the explanatory variables and sample distribution, I test whether the covariates have a statistically significant effect at the cutoff. The results of the tests are in Table 2, which show the regression discontinuity effect on the standard covariates of the project and creator, including US-based Kickstarter, whether it is a firm or not a firm, gender, and campaign duration of the Kickstarter. The RD effect is not statistically significant on all the covariates, showing that the covariates are continuous on the threshold.

Table 2: Covariate Balance Table

| Variables | <u>Control</u> |       |           | <u>Treated</u> |       |           | RD Effect | Robust <i>p</i> -val |
|-----------|----------------|-------|-----------|----------------|-------|-----------|-----------|----------------------|
|           | N              | Mean  | Std. Dev. | N              | Mean  | Std. Dev. |           |                      |
| US        | 188370         | 0.69  | 0.42      | 145101         | 0.62  | 0.41      | 0.22      | 0.83                 |
| company   | 188370         | 0.25  | 0.42      | 145101         | 0.29  | 0.41      | 0.19      | 0.85                 |
| male      | 188370         | 0.45  | 0.47      | 145101         | 0.31  | 0.43      | -0.18     | 0.86                 |
| female    | 188370         | 0.16  | 0.35      | 145101         | 0.19  | 0.36      | 0.37      | 0.71                 |
| Camp Dur. | 188370         | 34.28 | 69.23     | 145101         | 28.44 | 11.95     | 0.71      | 0.48                 |

The table displays the statistics of the covariates for entrepreneurs’ first Kickstarter projects. Campaign Duration (Camp. Dur.) is the total duration of the campaign from the launch date to the deadline. The values are rounded to the nearest two decimal places. The RD reflects individuals who are \$500 on either side of the treatment variable to calculate the RD-Effect and P-values.

In order to make causal inferences in a sharp regression discontinuity design, it is necessary to have a continuous variation of unobservable characteristics, in addition to observable attributes that determine the allocation of treatment to units, without any manipulation of precision. Consequently, a legitimate concern arises regarding the potential influence of individuals over their position relative to the cutoff.

In this scenario, it is not feasible for campaigners to enhance their own payoffs by donating

<sup>3</sup>Lee and Lemieux (2010) offer a detailed explanation of regression discontinuity design and its application in Economics.



to their own projects, as this would violate Kickstarter’s Terms of Service (TOS). Additionally, creators are unable to alter the campaign deadline once the goal is reached, and they cannot prematurely end the campaign. To ensure the integrity of the study, all suspended Kickstarter campaigns are excluded to avoid any manipulation of the running variable. Backers can continue contributing to the project until the deadline, allowing for a valid comparison of Kickstarter campaigns around the funding threshold.

The data shows that more Kickstarter campaigns are positioned just above the threshold than those below, as illustrated in Figure 2. To address this issue, the study will perform a robustness analysis using a donut-hole RD design. This analysis aims to provide evidence that the observed effect is not due to manipulation of the treatment variable.

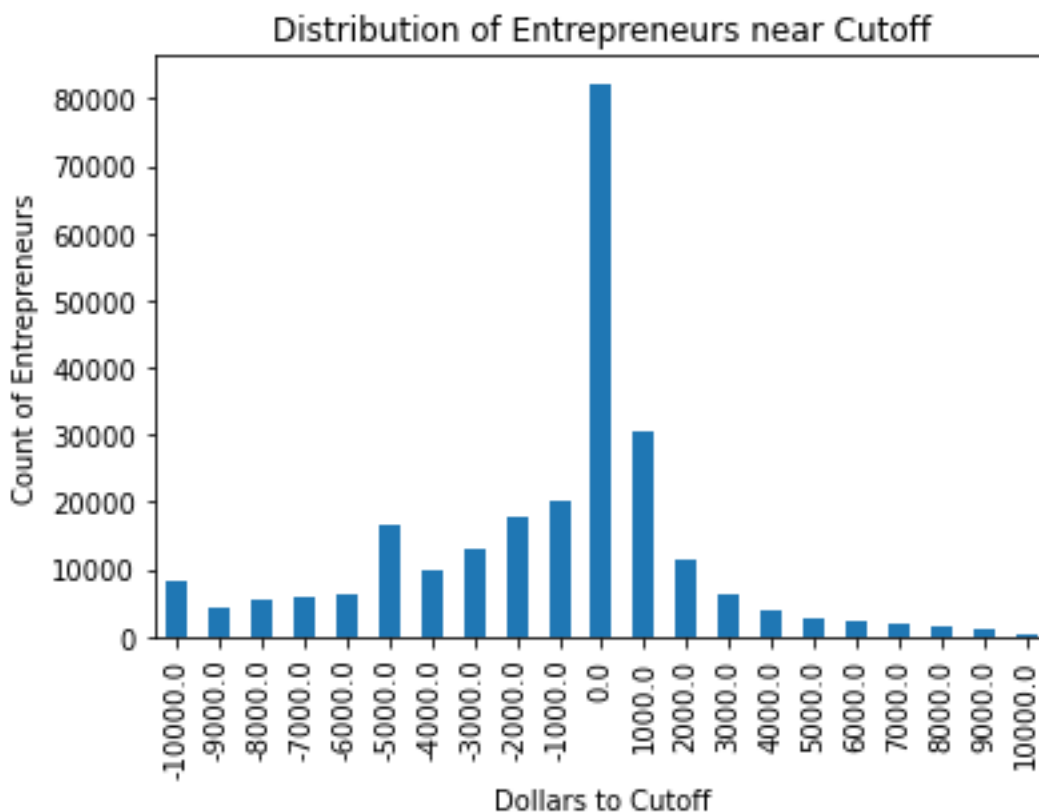


Figure 2: The distribution of data within the \$10,000 near the cutoff. This shows that there are a significant number of entrepreneurs to the right of the cutoff. This shows Kickstarter’s overall success and appeal as a funding opportunity for entrepreneurs looking for new ventures.

The study also aims to identify gender-based disparities within the crowdfunding landscape. An important consideration is the potential differences in the categories chosen by male and female entrepreneurs, which could introduce selection bias in the study. To address this concern, a category-specific RD analysis is carried out, and the top 10 estimates showing the greatest and smallest differences for each gender are determined. If non-stereotypical genders are prevalent in stereotypical categories, it could indicate a potential absence of selection bias in the data from Kickstarter.

To obtain an unbiased estimate of the “sharp” RD design, a second assumption is necessary, namely, the complete absence of overlap. This means that projects that fail to meet their funding goals must not receive funding from Kickstarter, and conversely, projects that do meet their funding goals must receive funding. It is safe to disregard the former scenario since firms that do not reach their funding goals never receive funding from the crowdfunding platform in the first place. However, the latter scenario is more complex. Some companies may be unable to fulfill their commitments, and consequently, they may be held responsible for reimbursing the backers, even if their projects have surpassed the threshold. These projects are known as “suspended” and are therefore excluded from the study.

One practical issue that arises is how to model  $f(X_i)$ . I test various “parametric” specifications using different polynomial functions of  $X_i$  calculated using the entrepreneurs near the cutoff point. Regardless of the parametric choice, the results obtained remain robust to all specifications when controlled for entrepreneur and time-fixed effects. Therefore, the research focuses on linear models, allowing the slope of these functions to vary across both sides of the cutoff.

One notable concern from the primary dataset is the assumption that the entrepreneurs’ initial Kickstarter campaigns only began in 2016. However, given that Kickstarter was established in 2009, this assumption may not be entirely accurate. Relying on this premise could introduce bias by potentially misidentifying individuals’ initial campaign occurrences. To address this issue, I utilize a dataset spanning Kickstarter’s records from 2009 to 2020, publicly available in ICPSR provided by Kickstarter (Leland, 2022). This extended dataset assists in evaluating the likelihood of a campaign within the gathered data representing an entrepreneur’s first experience with Kickstarter.

The preferred research design also examines different kernel specifications that assign varying weights to observations based on their distance from the cutoff. These kernels include uniform, triangular, and Epanechnikov. They are valuable tools in RD designs as they allow for the estimation of the LATE and offer flexibility in modeling the outcome variable without imposing strong assumptions on the data. Specifically, the preferred kernel, the Epanechnikov kernel, exhibits the smallest asymptotic bias among all kernels when used to estimate the LATE. It has a compact support, meaning it assigns zero weight to observations that are further away from the cutoff point than a certain distance. Additionally, it is straightforward to implement with less computational complexity and does not require additional tuning parameters.

Given that the dollars relative to the cutoff is a perfect predictor of treatment, it can be used to provide causal inference, provided that the unobserved characteristics of the entrepreneurs are continuous across the running variable. This allows for the comparison of the mean outcomes of entrepreneurs in a small range on either side of the cutoff. To determine the optimal threshold, I follow the methods outlined by Imbens and Kalyanaraman (2012) and Calonico et al. (2014) and also test against multiple thresholds for robustness.

## 5.2 Estimation

### 5.2.1 All Entrepreneurs

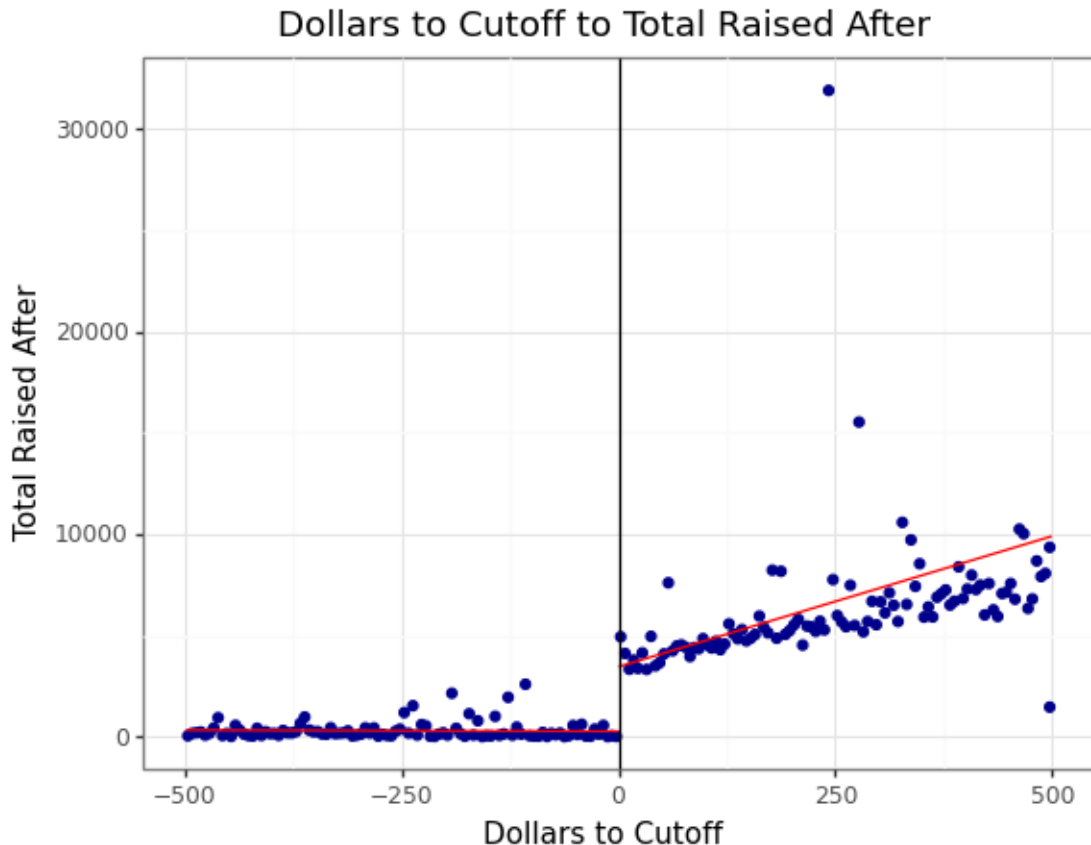


Figure 3: RD plot with Bandwidth of \$500. Data only between the bandwidth is binned in 100 bins on left and right of the cutoff. All values above 0 are treated, i.e., won the first Kickstarter campaign.

The regression discontinuity plot in Figure 3 illustrates the treatment effect of winning a Kickstarter campaign on the total dollars raised by entrepreneurs after their initial campaign. The plot clearly shows that the ability of entrepreneurs to raise additional funding differs significantly between those who successfully completed their first Kickstarter campaign and those who did not.

Based on the figure 3, completing a Kickstarter campaign leads to a total treatment effect of an increase in future funding ability by \$3,185.34, representing a 32% rise from the mean future funding of \$4,692.38 for entrepreneurs in the \$500 bandwidth. Compared to the complete dataset with no bandwidth, the increase in the ability to raise funding increases by 12.4%. These results indicate that entrepreneurs completing a Kickstarter campaign see significant enhancements in their ability to secure funding for future projects.

In Table 3, the impact of winning a Kickstarter on the dollars raised after the first campaign is presented. In row (1), the regression outcomes with a bandwidth of \$500 on

both ends of the cutoff are shown without any controls. Row (2) illustrates the change from an Epanechnikov kernel to a triangular kernel, which assigns higher weights to data closer to the threshold and lower weights to the points away from the threshold. In row (3), the linear functional form is replaced with a quadratic functional form.

The findings are robust across various model specifications. For example, row (4) introduces controls to the RD Design, including whether the Kickstarter campaign was in the US or not, and the campaign duration, thereby enhancing the reliability of the results. Furthermore, rows (5) and (6) change the bandwidth from the \$500 bandwidth to the optimal bandwidth by Imbens and Kalyanaraman (IK) and Calonico, Cattaneo and Titiunik (CCT), respectively. Despite these changes, the key conclusion remains consistent: winning the first Kickstarter campaign has a positive and statistically significant effect on the estimated dollars raised by entrepreneurs.

Table 3: Dollar Difference Discontinuity and Corresponding Dollars Raised After For All Entrepreneurs

| Regression Specification   | Function of Dollar Difference | Kernel       | Additional Controls | Discontinuity          |
|----------------------------|-------------------------------|--------------|---------------------|------------------------|
|                            |                               |              |                     | Estimated Raised After |
| (1) Regression in Figure 3 | Linear                        | Epanechnikov | No                  | \$3,185.34***          |
| (2)                        | Linear                        | Triangle     | No                  | \$3,141.22***          |
| (3)                        | Quadratic                     | Epanechnikov | No                  | \$2,899.43***          |
| (4)                        | Linear                        | Epanechnikov | Yes                 | \$3,078.46***          |
| (5)(IK BW: \$102)          | Linear                        | Epanechnikov | No                  | \$2,889.01***          |
| (6)(CCT BW: \$2,155)       | Linear                        | Epanechnikov | No                  | \$3,996.42***          |

Notes: Additional controls include US-based campaigns or not and campaign duration. \*, \*\*, and \*\*\*: statistical significance at the 10%, 5%, and 1% levels, respectively.

### 5.2.2 Gender Differences

Table 4 presents the impact of winning the initial Kickstarter campaign on future funding and success rates for both males and females. Our findings reveal that males experience a greater improvement in their ability to raise future funding than females. The results are statistically significant for higher sets of optimal bandwidths, but the differences are not statistically significant within the current sample.

In the first specification, males increase their ability to raise funding by 42% compared to average male funds raised of \$7,332. Conversely, females see an improvement of 45% compared to average female funds raised of \$6,025. However, with the mean dollars raised after the first campaign being \$9,931, males increased the dollars raised by 31%, whereas women only increased their dollars raised by 27%.

In contrast, the success rates display comparable improvements across genders, albeit with a minor variance in degree. Irrespective of the chosen bandwidth or kernel, the outcomes demonstrate statistical significance and remain consistent between genders. This

result provides evidence of Kickstarter’s fair terms of use and equitable actions to help end prejudices against and increase opportunities for women.

Table 4: Dollar Difference Discontinuity and Outcomes Across Gender

| <b>Panel A: Total Raised After</b> |                 |              |          |               |                |            |
|------------------------------------|-----------------|--------------|----------|---------------|----------------|------------|
|                                    | Functional form | Kernel       | Controls | Males         | Females        | Difference |
| (1)                                | Linear          | Epanechnikov | No       | \$3,066.24*** | \$2,756.56***  | 0.92       |
| (2)                                | Linear          | Triangle     | No       | \$2,987.03*** | \$2,701.07***  | 0.86       |
| (3)                                | Quadratic       | Epanechnikov | No       | \$2,622.26*** | \$2,456.98 *** | 0.41       |
| (4)                                | Linear          | Epanechnikov | Yes      | \$2,919.48*** | \$2,656.33***  | 0.78       |
| (5)                                | Linear          | Epanechnikov | No       | \$2,215.61*** | \$2,247.85***  | -0.12      |
| (6)                                | Linear          | Epanechnikov | No       | \$4,018.73*** | \$2,961.39***  | 3.04***    |
| <b>Panel B: Success Rate</b>       |                 |              |          |               |                |            |
|                                    | Functional form | Kernel       | Controls | Males         | Females        | Difference |
| (1)                                | Linear          | Epanechnikov | No       | 78.1%***      | 78.03%***      | 0.06       |
| (2)                                | Linear          | Triangle     | No       | 76.5%***      | 76.6%***       | -0.15      |
| (3)                                | Quadratic       | Epanechnikov | No       | 70.3%***      | 71.4%***       | -0.72      |
| (4)                                | Linear          | Epanechnikov | Yes      | 78.2%***      | 78.1%***       | 0.08       |
| (5)                                | Linear          | Epanechnikov | No       | 60.1%***      | 61.6%***       | -0.68      |
| (6)                                | Linear          | Epanechnikov | No       | 82.1%***      | 82.0%***       | 0.07       |

[1]Additional controls include campaign duration and US-based Kickstarter dummy. \*, \*\*, and \*\*\*: statistical significance at the 10%, 5%, and 1% levels, respectively.

Figure 4 illustrates the variation in estimates based on the chosen categories. In categories such as Social Practice, Software, Apps, Ready-to-wear, and Pet Fashion, there is a notable increase in future total dollars raised for females. Conversely, males experience larger gains in categories like Television, Sound, Fiction, Photo, and Fantasy. However, categories such as Electronic Music, Nonfiction, Video Games, and Food show minimal to no difference in total dollars raised after the initial Kickstarter campaign.

This emphasizes a key finding: the discrepancy in total dollars raised between male and female estimates for their first Kickstarter campaign is not influenced by the entrepreneurs’ choice of category. If it were, we would expect higher gains for males in male-dominated categories like video games and software and vice versa for females. However, the data suggests little to no difference or even the opposite effect for categories predominantly occupied by males.

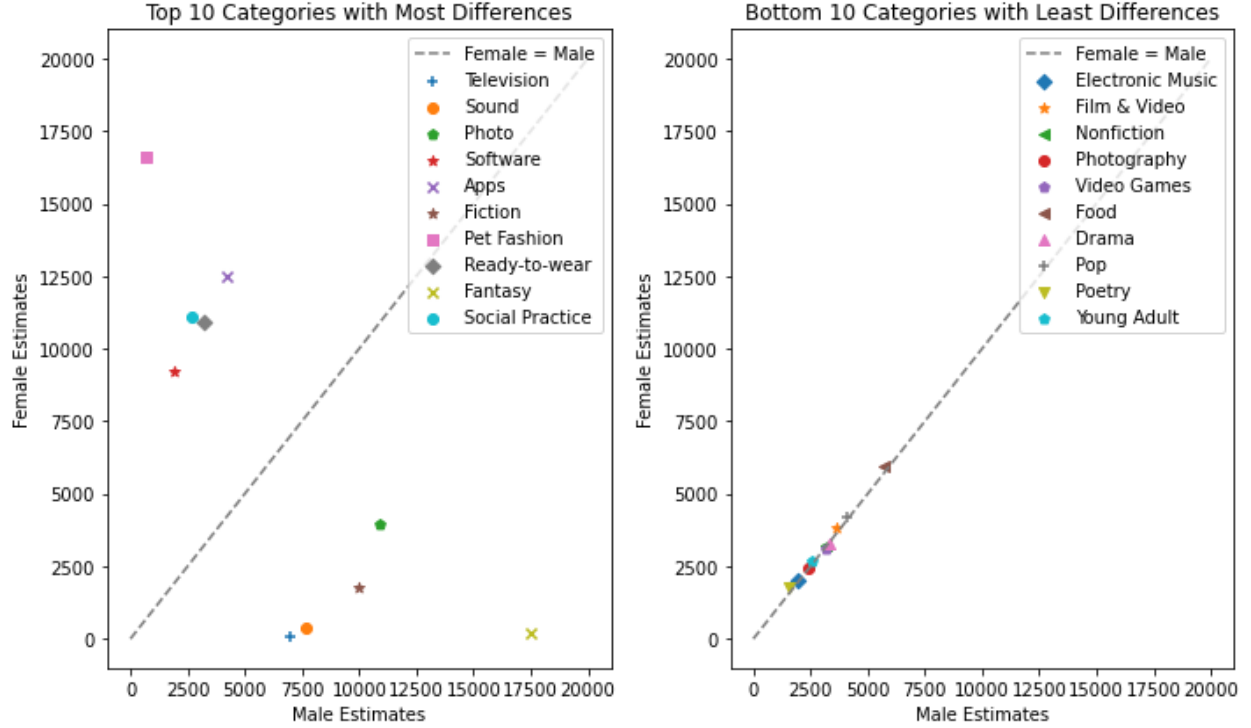


Figure 4: RD Estimates of Top 10 most different categories compared to the least different categories

## 6 Robustness

### 6.1 Including Outliers

All initial Kickstarter campaigns that have failed or completed a campaign with more than \$100,000 are considered in this section. Including the outliers change the IK optimal bandwidth from \$102.50 to \$464.07, and the plot results are available in Figure 5. Adding the outliers increases the total dollars raised to \$3,138.60 compared to \$3,066.24. This shows that outliers near the optimal bandwidth have little to no effect on the outcomes.

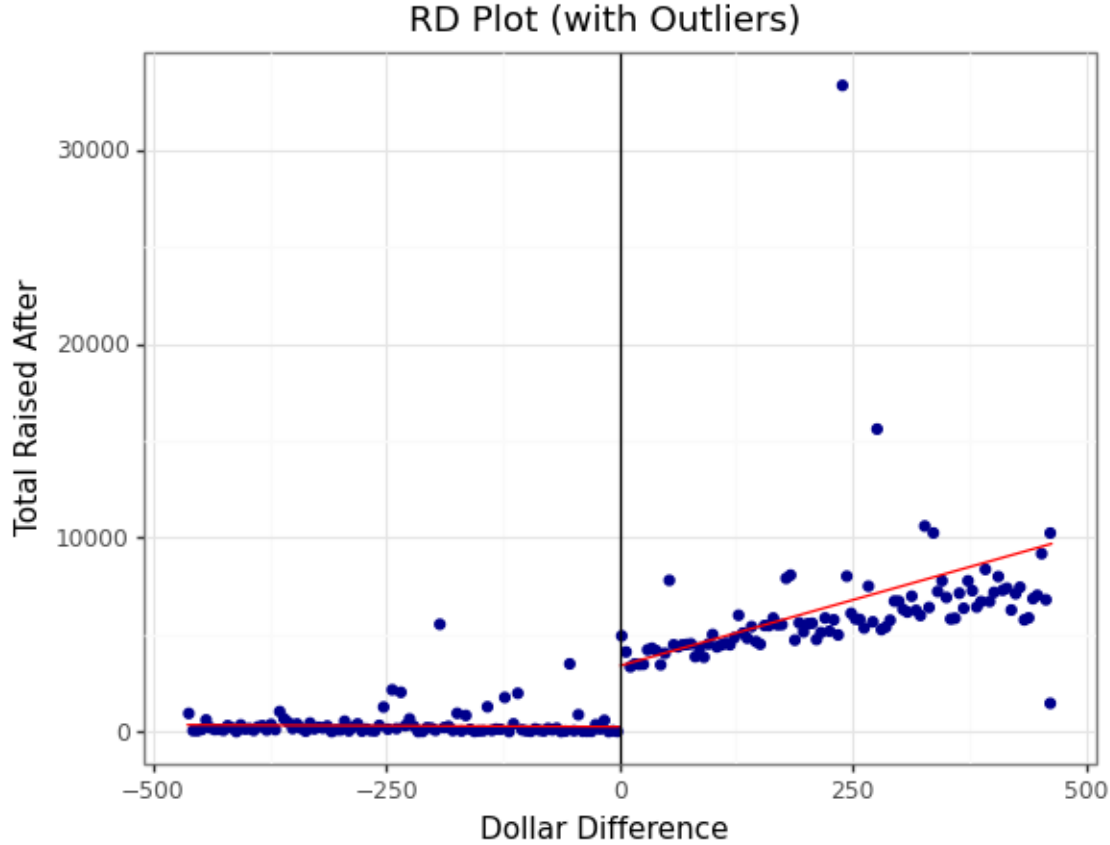


Figure 5: This shows the effect of including 15,687 outliers that have their first projects gaining too many dollars or setting too high of a goal.

## 6.2 Probability of Treatment as weights

The analysis of gender disparities started in 2016, which imposes limitations on its capacity to definitively ascertain whether the Kickstarter campaign initiated represents the individuals' first campaigns. This gives rise to a downward bias, as erroneously identified participants might conceivably possess prior experience, thereby augmenting their probability of achieving greater success.

To address the aforementioned concern, I utilize a publicly accessible dataset obtained from ICPSR, encompassing Kickstarter campaign-level data spanning the period from 2009 to 2020. To ascertain the likelihood of a Kickstarter campaign being the creator's first campaign on the platform, a Light Gradient-Boosting Machine (LGBM) model is employed. LGBM model is used due to its near-perfect out-of-sample prediction on test data from ICPSR compared to only a 0.635 ROC-AUC score of the logistic regression. The model is trained on the ICPSR data, which includes Unique IDs (distinct from those in the primary dataset) for creators to identify whether the campaign represents their first on the platform. The LGBM model integrates various factors, such as category, currency employed on Kickstarter, campaign duration, launch year, total fundraising goal, cumulative pledged amount, and the count of backers supporting the project.

Following the training of two distinct models—one for individuals whose campaigns have successfully met their goals and another for creators whose campaigns have not—the probabilities for the primary dataset are predicted for each entrepreneur. These probabilities are subsequently multiplied by the kernel weights in the regression discontinuity design. The results, detailed in Table 5, indicate that the successful completion of the initial Kickstarter campaign causes an increase in the fundraising capacity of all entrepreneurs by \$3,165.56. The inclusion of weights introduces slight variations in estimates but does not exert a significant impact on the effect of winning a Kickstarter campaign on the total raised dollars subsequent to the first Kickstarter campaign.

Table 5: Including Probability of treatment as weights

| Regression Specification | Function of Dollar Difference | Kernel       | Additional Controls | Discontinuity          |
|--------------------------|-------------------------------|--------------|---------------------|------------------------|
|                          |                               |              |                     | Estimated Raised After |
| (1) \$500 BW             | Linear                        | Epanechnikov | No                  | \$3,481.80***          |
| (2)                      | Linear                        | Triangle     | No                  | \$3,427.78***          |
| (3)                      | Quadratic                     | Epanechnikov | No                  | \$3,153.64***          |
| (4)                      | Linear                        | Epanechnikov | Yes                 | \$3,413.46***          |
| (5)(IK BW: \$102)        | Linear                        | Epanechnikov | No                  | \$3,098.75***          |
| (6)(CCT BW: \$2,155)     | Linear                        | Epanechnikov | No                  | \$4,324.39***          |

Notes: Additional controls include US based Kickstarters or not, and campaign duration. \*, \*\*, and \*\*\*: statistical significance at the 10%, 5%, and 1% levels, respectively.



### 6.3 Donut-Hole RD

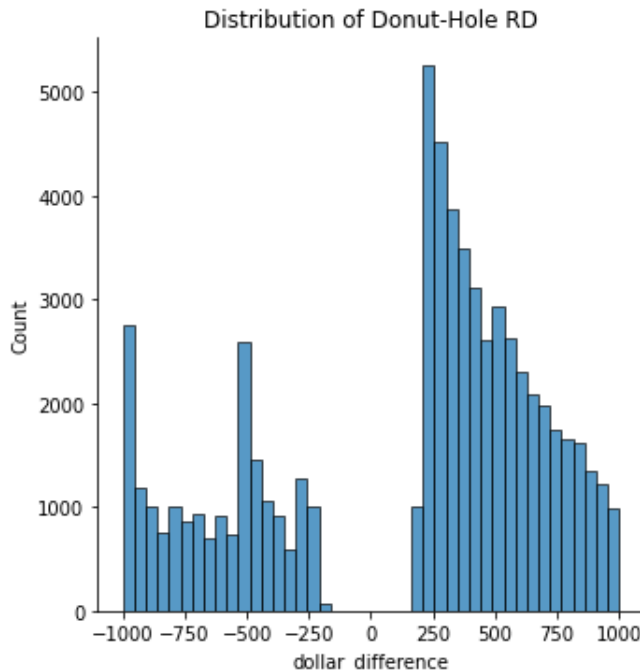


Figure 6: The density of the data when conducting a donut hole RD within a \$1,000 bandwidth.

Due to the discontinuity in the distribution of individuals near the cutoff, a natural concern is that Kickstarter creators can manipulate the running variable leading to the discontinuity effect being due to creators being able to manipulate the dollars raised perfectly. To provide evidence against it, a regression discontinuity is performed which removes individuals near the cutoff, referred to as the "donut-hole" regression discontinuity (Barreca et al., 2011). In this method, I systematically remove Individuals in the immediate vicinity of the threshold (\$200) and re-estimate the discontinuity on the remaining samples.

The density plot for the donut-hole Regression Discontinuity (RD) can be found in Figure 6. The distributions on the right and left sides of the cutoff closely resemble the patterns observed in Figure 2. Detailed results of the Donut Hole RD can be seen in Table 6. Notably, various RD specifications demonstrate statistical significance. A bandwidth of \$1,000 is set as the baseline, revealing that the effect of successfully completing the first campaign continues to significantly impact the fundraising capability in comparison to entrepreneurs who do not successfully finish their initial campaign.

Table 6: Donut Hole Regression Discontinuity

| Regression Specification | Function of Dollar Difference | Kernel       | Additional Controls | Discontinuity          |
|--------------------------|-------------------------------|--------------|---------------------|------------------------|
|                          |                               |              |                     | Estimated Raised After |
| (1)                      | Linear                        | Triangle     | No                  | \$6,015.40***          |
| (2)                      | Quadratic                     | Epanechnikov | No                  | \$8,351.25**           |
| (3)                      | Linear                        | Epanechnikov | Yes                 | \$5,932.03***          |
| (4)(CCT BW: \$622.53)    | Linear                        | Epanechnikov | No                  | \$6,830.54***          |

Notes: Additional controls include US-based campaigns or not, and campaign duration. \*, \*\*, and \*\*\*: statistical significance at the 10%, 5%, and 1% levels, respectively. Data for \$102 bandwidth is unavailable due to Donut Hole hence the IK bandwidth is not included. All RDs are done with \$1,000 bandwidths unless otherwise stated

## 6.4 Cutoff and Bandwidth

Figure 7 displays our sensitivity analysis results to the cutoff point choice. The figure shows that the estimated treatment effect is statistically insignificant for most of the cutoff points, except for the true cutoff point, which is located at 0. This finding provides evidence that the Local Average Treatment Effect (LATE) of winning the Kickstarter campaign is driven by actual winning status rather than mere proximity to the cutoff point. Some cutoffs do not have standard errors due to fewer Kickstarter projects left of the cutoff compared to the right.

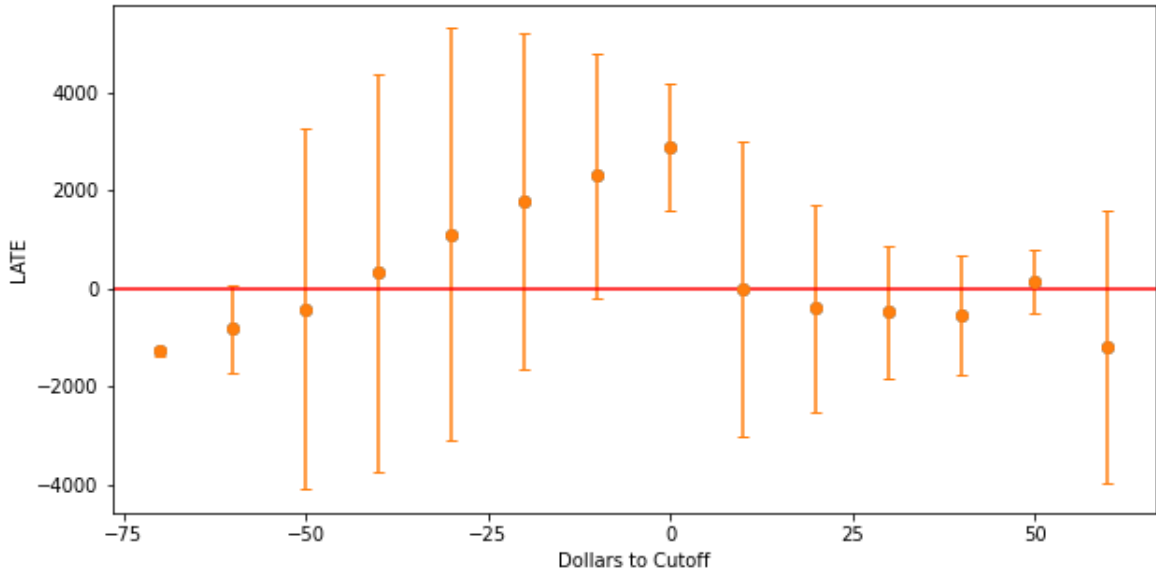


Figure 7: Analysis of LATE on the sensitivity to threshold. It is evident that the true threshold of 0 has a positive statistically significant LATE with largely no effect on any other threshold. This plot uses the optimal bandwidth as suggested by IK, i.e. \$102.50.

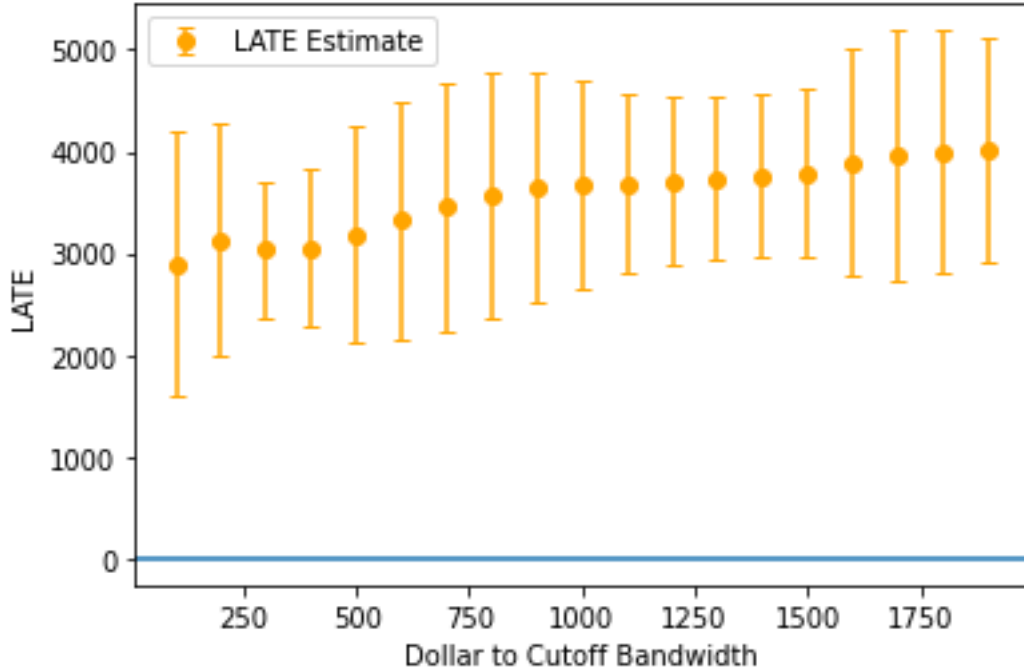


Figure 8: Analysis of LATE on the sensitivity to bandwidth choice. The figure shows that largely any choice of bandwidth is able to uncover the LATE except the extremely small bandwidth.

Figure 8 presents the results of our sensitivity analysis on the choice of bandwidth. The plot shows that the estimated effect of winning the first Kickstarter campaign on the total dollars raised after the campaign remains similar to the estimates reported in Table 3 and is robust to the choice of bandwidth. The smaller bandwidth choices produce statistically insignificant results due to a smaller number of observations available on both sides of the threshold, but the effect remains qualitatively unchanged.

## 7 Conclusion

This study examines the gender dynamics within Kickstarter, a prominent online crowdfunding platform, with the goal of uncovering the influence of initial Kickstarter campaign results on the ability to secure subsequent funding. The findings indicate that men generally outperform women in online crowdfunding. These statistically significant findings hold across all aspects of the study, suggesting promising opportunities for young entrepreneurs to utilize online crowdfunding as a means of raising capital for their projects.

The study finds that successfully completing a Kickstarter campaign leads to increased total future funding acquired by entrepreneurs who use Kickstarter to fund their future projects. This increase is \$3,185, which is approximately a 32.1% increase compared to the mean funding in the future of \$9,931. This effect remains robust regardless of the choice of bandwidths, kernels, or choice of functional form. On the other hand, the study finds statistical differences across genders for higher bandwidths, with male entrepreneurs receiving

approximately \$1,000 more compared to female entrepreneurs who successfully complete their first Kickstarter.

This phenomenon could be attributed to several factors. Firstly, gender bias in assessments could lead to fewer pledges for women compared to their male counterparts, as observed by Ridgeway and Correll (2004). This imbalance persists even when women demonstrate their competence on the platform. This has significant implications in terms of the barrier that female entrepreneurs face in innovation, along with reinforcing stereotypes within new funding approaches for business ventures. This allows researchers to delve deeper into understanding the reasons behind such funding gap and combat gender bias and discrimination in online crowdfunding and entrepreneurship.

Secondly, in situations where entrepreneurs share equal levels of risk aversion and lack experience in crowdfunding, a level playing field emerges, enabling both genders to use Kickstarter for project funding. Insights gleaned from the donut-hole RD and weighted RD methodologies further bolster the lasting impact of a successful campaign on future prospects. This provides evidence of the practical use of reward-based crowdfunding and provides private investors with a strong signal about the validity of new businesses.

The study also sheds light on the positive influence of Kickstarter on the capacity of young entrepreneurs to secure subsequent funding, a finding that contradicts prior research by Schwienbacher and Larralde (2012). The funding increase from Kickstarter campaigns, which can reach as high as 68% compared to the average future funding, provides evidence for angel investors and venture capitalists to take crowdfunding signals and early-stage funding more seriously, as they have a higher potential for success. These discoveries hold noteworthy implications for policymakers, who can leverage them to cultivate a more level playing field for both genders on crowdfunding platforms and other funding avenues. This endeavor has the potential to ameliorate gender disparities in innovation and further exemplify the sagacity of collective decision-making. With appropriate incentives and parity in opportunities, online crowdfunding could emerge as a more efficient mechanism for market equilibrium and optimized investments by discerning investors.

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