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 common method for "new" entrepreneurs to acquire financial support. Subsequently, it studies gender-based heterogeneity in acquiring funding on future outcomes for first time entrepreneurs. The study employs a regression discontinuity design to address the issue of non-random assignment of first campaigns run by entrepreneurs. According to the findings, successfully completing the first Kickstarter campaign results in an increase of 32% compared to the mean funding received after the first campaign. For female entrepreneurs, successfully completing their first project yields a smaller increase of $2,961 in raising funds via crowdfunding, as opposed to their female counterparts who fail to finish their campaigns. However, males see an increase of $4,018 which is a 40% increase compared to the mean funds raised in the future for all entrepreneurs and is statistically different than their female counterparts for a subset of the sample. 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 significant attention in recent years. Numerous studies have also underscored the difficulties encountered by women entrepreneurs in 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 the context of 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 raise 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 has several advantages, such as 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 $17.2 billion in North America alone, highlighting the widespread use of crowdfunding by entrepreneurs to acquire capital for innovative projects. However, research on the causal effect of raising funds through these platforms still 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 (referred to as 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 successfully 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 the non-random assignment of first projects by entrepreneurs. The unobserved abilities of entrepreneurs can affect their capacity to secure additional funding. To address this issue, a regression discontinuity (RD) design that leverages a sharp discontinuity of dollars pledged by backers in entrepreneur's campaigns is utilized. This design allows for an examination of the impact of achieving success in the first Kickstarter project on the ability to generate funding for future ventures. Moreover, this study characterizes the impact 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 successfully completing the first Kickstarter campaign results in an increase of $3,185.34, which represents a 32% increase compared to the mean funding obtained after the 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 are statistically significant for higher set of bandwidths, providing evidence of gender disparity in a subset of the sample at acquires capital using Kickstarter as the crowdfunding platform.

2 Literature Review

This study makes contribution to the existing body of literature that aims to unravel the factors influencing entrepreneurial success. Among these factors, funding plays a pivotal role, particularly for small and medium-sized enterprises (SMEs). These SMEs often face substantial credit constraints, which can in turn influence the ability of entrepreneurs to enter a given market (Aghion et al., 2014). At the entrepreneurial level, the capacity to persist or the perception of persistence has proven to be a valuable trait for entrepreneurs seeking success in business endeavors (Gompers et al., 2010). Astebro et al. (2014) have undertaken an extensive exploration of the individual determinants of entrepreneurship, utilizing an approach rooted in expected utilities framework. Their analysis reveals that the projected returns from entrepreneurial activities display notable variance and typically remain modest. Such effect is attributed largely to the considerable rate at which startups fail and the infrequent emergence of extremely successful startups. Given the growing interest in comprehending what leads entrepreneurs to succeed in their ventures, this study offers an explanation through the lens of crowdfunding.

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 for 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., 2021; Wang et al., 2023). But there exists a notable gap in understanding the long-term implications of Kickstarter success. This study seeks to address 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 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.

Differences in gender gap have become increasing due to non conventional human capital variables like gender differences in occupation and industry (Blau and Kahn, 2017). Within the entrepreneurship literature, women entrepreneurs have faced large disparities in being able to procure business loans and paying higher interests rate when a loan is procured with these disparities becoming increasingly evident even in societies that have greater women's empowerment (Malmström et al., 2023). The key issue that plagues female entrepreneurs, that are starting a new (or first) business venture, is of credit constraints. Numerous studies have shed light on the challenges women entrepreneurs face when seeking access to vital

financing and other essential resources crucial for the success of their enterprises. For instance, Coleman (2012) found that women entrepreneurs exhibit a lower likelihood, in comparison to their male counterparts, of securing external sources of funding, such as venture capital and angel investments. Other research has also looked at the perceived financial barriers that disproportionately affect women over men (Roper and Scott, 2009) which leads them to become discouraged borrowers (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, the full extent of these disparities and inequalities in the digital market remains a domain that has not been thoroughly comprehended through causal estimates, which is the primary objective of this study.

Gender disparities are also prevalent in other entrepreneurial areas, such as patenting, where women's patents have 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 higher likelihood at 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.

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, which means that campaigns must reach their fundraising goal in order for the project to receive any funding. Under this model, entrepreneurs or creatives who launch a crowdfunding campaign on Kickstarter set a fundraising goal that they must meet within a specified time frame, typically 30 to 60 days. If they fail to meet the goal by the end of the campaign, they receive no funding at all, and backers are not charged for their pledges.

The all-or-nothing model is designed to provide some level of protection to backers by ensuring that entrepreneurs or creatives who receive funding are committed to delivering their products or services as promised. It also incentivizes entrepreneurs or creatives to set realistic fundraising goals and to work hard to promote their campaigns, as they know that they must meet their goal in order to receive any funding.

To launch a campaign on Kickstarter, entrepreneurs create a project page that includes a video explaining their product or service, a description of the project, and a set of rewards

that backers can receive for supporting the campaign. The fundraising goal and deadline for the campaign are also set by the entrepreneur. Additionally, Kickstarter provides some help to entrepreneurs in deciding the correct payout depending on the taxes in the state or country of origin, and the choice of campaign duration is restricted to a maximum of 60 days.

One reason why Kickstarter is believed to have a successful impact on projects and entrepreneurs worldwide is that it provides a platform for entrepreneurs to test their products/services before launching them publicly. This allows for demand estimation, which can largely help determine the success of the product. 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 that the project's success is uncertain. This can help to build momentum for the campaign and attract more backers, increasing the chances of success.

4 Data

This study utilizes project level data from Kickstarter. This data is collected through the use of a monthly-executed web scraper[1] and provides information on project status (active, completed, failed, canceled or suspended) and detailed creator-level project data (creator and project name, product's funding information, and launch and deadline dates). Unique creator identification numbers allow the ability to follow creators throughout their projects and across multiple projects. The outcome measure used is the total dollars raised after the first Kickstarter campaign. This sums the dollars raised in future Kickstarter campaigns if and only if the future campaign is successful.[2]

The base sample for this study consists of the all the Kickstarter campaigns from April 2014 through September 2022, a total of 349,158 unique first time Kickstarter campaigns. I delete approximately 5% of the cases that have a total dollars to their goal exceeding over $100,000 or are below $100,000 for accurately measuring bandwidths leaving a sample of 333,471 initial campaigns[3]. Additionally, 0.44% campaigns are 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). Campaigns that have had an end-result of success, failure or cancellation are represented in the sample when calculating the imputed variable since all other statuses reflect an ongoing Kickstarter campaign.

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

[1]The data from this scraper is publicly available by the developers on Robots (2023).

[2]This imputed variable provides several advantages over success rates after the first Kickstarter, which are identified as not a reliable predictor of entrepreneur's future success by Schwienbacher and Larralde (2012):(1) The metric encapsulates the culmination of various strategic and executional facets that drive a project's success; (2) It captures the cumulative effect of an entrepreneur's Kickstarter campaigns and take into account potential impact of developing a loyal customer base, and the developing skill set due to multiple campaigns.

[3]Bandwidths by Calonico et al. (2014), Imbens and Kalyanaraman (2012) provide data driven bandwidths and therefore including the outlier causes significant changes to the estimated bandwidths. A robustness check is provided including the outliers and keep the old set of bandwidths to show that dropping the outliers causes little no statistical change in the outcome of the study.

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 the 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 contains several noteworthy points. Firstly, in Panel A, the dollar amounts are depicted as negative, signifying unsuccessful Kickstarter campaigns. The larger figures indicate that, on average, entrepreneurs who experience initial failure do so with a substantial deviation from their pledged goal amounts. Secondly, regardless of the treatment, male and female participants exhibit distinct campaign goals and receive varying funding amounts. Thirdly, male entrepreneurs achieve an average number of backers that is 29.2% higher than that of their female counterparts when they complete their first Kickstarter whereas the difference between male and female backers is negligible when both fail their first Kickstarter campaign. Lastly, the total number of women being represented in the data are significantly lower than men, a result that resonated with the findings in Gafni et al. (2020).

Table 1: Statistics by Gender

Panel A: Failed First Kickstarter						
Gender	US based	Dollars To Cutoff (in $)	Goal	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
Panel B: Completed First Kickstarter						
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	11333.65	135.39	6,902
Mostly Male	0.79	3,027.29	7,127.04	10154.32	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 focus of this research design is to investigate whether discontinuities in the "all-or-nothing" framework of Kickstarter correspond to similar discontinuities in other outcomes. To accomplish this, project-level data is analyzed as it is the initial information that backers are presented with. The identification of entrepreneurs involved in each Kickstarter project is carried out by linking them through their unique person ID, and their subsequent projects created to obtain future funding after the initial campaign are also identified. Projects that entrepreneurs fail, succeed, and cancel after their first one are considered. Using the technique, the dollars remaining to reach the goal induces a discontinuity in the relationship between successful entrepreneurs and their future outcomes.

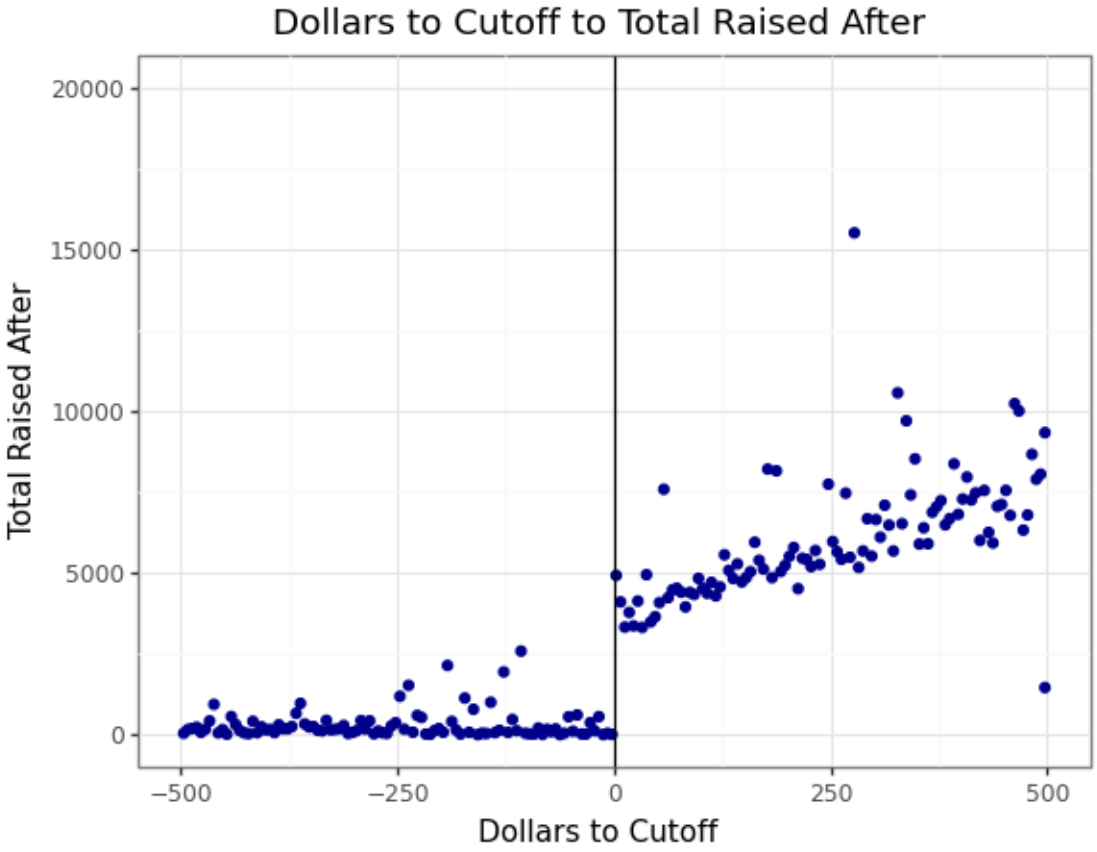

Figure 1: The figure emphasizes the discontinuity of receiving funding in an entrepreneur's first campaign on total dollars raised after. The data is divided into 100 bins with an average bin length of $5. Data is weighted based on an Epanechnikov kernel.

Figure 1 illustrates the total amount of dollars raised by entrepreneurs across all campaigns, excluding the first campaign, within a $500 bandwidth and compares it with how close their first project was to being funded. Entrepreneurs situated to the right of the cutoff are treated, which means that they receive funding based on the pledges made by donors for their first

project. Furthermore, the visual discontinuity is evident, with very little funding being accumulated after the first campaign on the left of the cutoff, as compared to the right.

A "sharp" RD to estimate discontinuities in outcomes at the dollar cutoff can be employed, which provides the Local Average Treatment Effect (LATE) i.e. the effect of successfully completing a Kickstarter campaign for individuals that are compliers that are near the threshold, i.e. that do receive the funding and are inside the bandwidth. Lee and Lemieux (2010) provide a detailed understanding of regression discontinuity design and its use in Economics. The research focuses on reduced form LATE estimates because of the lack of information on revenues of the initial projects ran by entrepreneurs.

The identification of causal effects resulting from the successful completion of initial Kickstarter campaigns depends on assuming continuity in explanatory variables that are close to the threshold. This assumption appears reasonable, given that entrepreneurs situated just above and below the cutoff exhibit similarity in all respects except for the treatment variable. To verify that continuity exists in the explanatory variables and distribution of the sample, 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 common 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. With all the covariates, the R.D. effect is not statistically significant showing that the covariates are continuous on the threshold.

Table 2: Covariate Balance Table

	Control			Treated				
Variables	N	Mean	Std. Dev.	N	Mean	Std. Dev.	RD Effect	Robust p-val
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

Table shows the statistics of the covariates for entrepreneurs' first Kickstarter projects. Camp. Dur. is defined as the total duration of campaign from launch date to deadline. Values are rounded to the nearest 2 decimal places. The RD reflects individuals $500 on either side of the treatment variable to calculate the RD-Effect and P-values.

Controlling for covariates such as project year, duration, characteristics, and other relevant factors, we can then focus on what these entrepreneurs achieve in the future given that they received or did not receive funding in their first campaign.

The assumptions required for causal inference for sharp RD entail a continuous variation of unobservable characteristics alongside observable attributes that dictate the treatment allocation of units, essentially known as no manipulation with precision. So, a natural concern would be that individuals can influence whether or not they can influence their position relative to cutoff.

In this case, it is impossible since campaigners do not have the ability to donate to their own project to marginally improve their payoffs since it violates Kickstarter's Terms of Service (TOS). Since creators can also not change the deadline, after the goal is met,

creators cannot stop the campaign leading to no true manipulation of the running variable. The study drops all suspended Kickstarter campaigns to avoid projects that manipulate the campaign in any way. Backers that contribute to the project can continue to fund the project before the deadline and therefore a viable bandwidth can be employed to compare Kickstarter campaigns around the threshold.

There is a greater count of Kickstarter campaigns positioned just above the threshold compared to those below, as depicted in Figure 2. In order to address this concern, the study will conduct a robustness analysis using a donut hole Regression Discontinuity (RD) design. This analysis aims to furnish evidence demonstrating that the observed effect is not a result of manipulation of the independent variable.

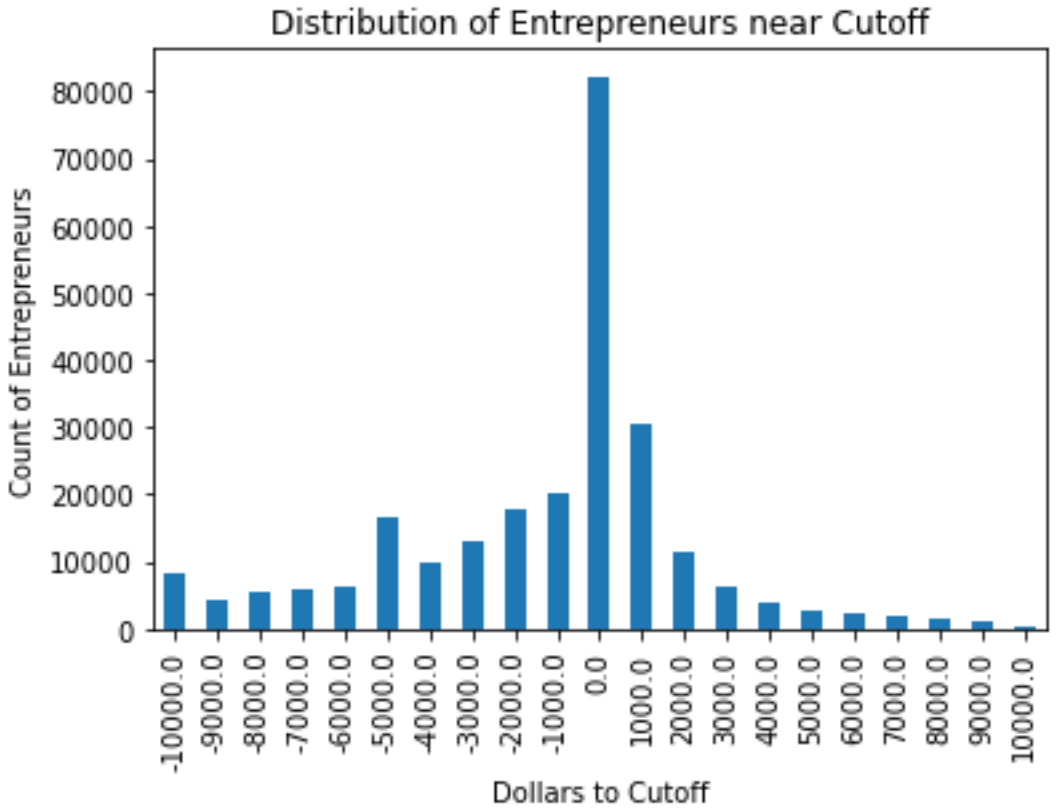

Figure 2: The distribution of data within the $10,000 near the cutoff. This shows that there are significant number of entrepreneurs to the right of the cutoff. This shows the overall success and appeal of Kickstarter as a funding opportunity for entrepreneurs that are looking for new ventures.

Another goal of this study is being able to identify gender based disparities within the crowdfunding scenario. A highlighted concern is that of potential differences in the choice of categories that male and female entrepreneurs choose leading to selection bias in the study. To alleviate this concern, a category wise regression discontinuity is analyzed and the top 5 estimates where the most and least differences is exhibited by each of the gender is shown. Dominance of non-stereotypical gender in stereotypical categories would indicate potential lack of selection bias in Kickstarter's data.

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 and calculated using the entrepreneurs near the cutoff point. Regardless of parametric choice, the results obtain 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.

Another concern arising from the primary dataset pertains to the implicit assumption that the initial Kickstarter campaigns of the entrepreneurs would originate only from 2016 onwards. However, this assumption may not necessarily hold factual ground, given that Kickstarter was established in 2009. Relying on this premise could introduce notable bias by potentially misidentifying individuals' initial campaign occurrences. To address this issue, I employ a dataset spanning Kickstarter's records from 2009 to 2020 available publicly in ICPSR provided by Kickstarter. This extended dataset aids in gauging the likelihood of a campaign within the gathered data actually representing an entrepreneur's first experience with Kickstarter.

Preferred research design also looks at different kernel specifications which weigh observations differently depending on the distance of the cutoff. These kernels include uniform, triangular and Epanechnikov. These kernels are a powerful tool in RD designs because they enable the estimation of the LATE and provide flexibility in modeling the outcome variable, all without imposing strong assumptions on the data. Specifically, the preferred kernel, Epanechnikov kernel, has the smallest asymptotic bias among all kernels when used to estimate the LATE. It has a compact support, meaning that it assigns zero weight to all observations that are further away from the cutoff point than a certain distance. It is also easy to implement with computationally less complex and does not require additional tuning parameters.

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

5.2 Estimation

5.2.1 All Entrepreneurs

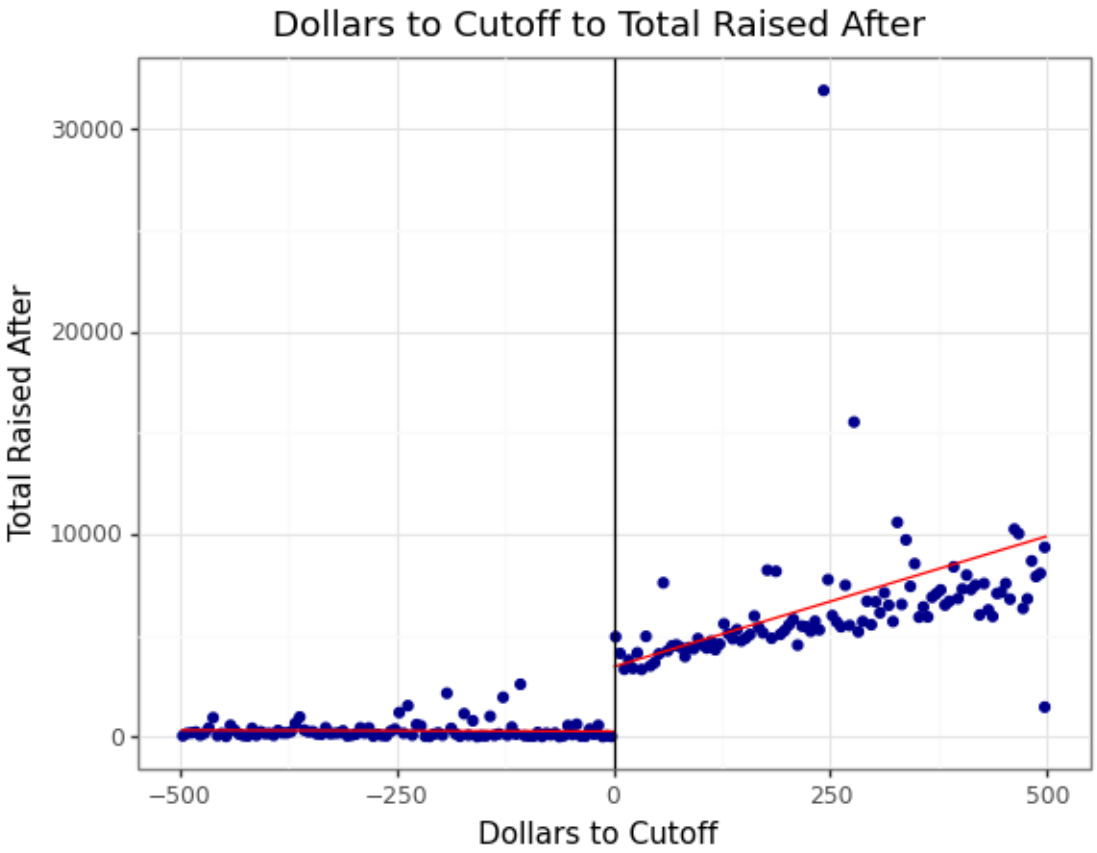

Figure 3: RD plot with Bandwidth of $500. Data only between the bandwidth is binned in 100 bins on left and right of the cutoff. All values above 0 are treated i.e. won the first Kickstarter campaign.

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.

As indicated in the figure, the total treatment effect of successfully completing a Kickstarter campaign is an increase in the ability to raise future funding by $3,185.34. This amount represents a 68% increase from the mean dollars raised in the future by entrepreneurs in the $500 bandwidth, which is $4,692.38. Compared to all data, the increase in ability of raise funding increases by 12.4%. These findings demonstrate that entrepreneurs who successfully complete a Kickstarter campaign experience significant improvements in their ability to secure funding for future projects.

Table 3 shows the results of the impact of winning a Kickstarter on the dollars raised

after the first campaign. Row (1) presents the regression outcomes with a bandwidth of $500 on both ends of the cutoff without any controls. In row (2) the kernel changes from Epanechnikov to a triangular kernel. A triangular kernel provides higher weights to data that are closer to the threshold and lower weights to the points away from the threshold. Row (3) replaces the linear functional form to a quadratic functional form.

Row (4) introduces controls to the RD Design, including whether the Kickstarter campaign was in the US or not, and the campaign duration. Finally, rows (5) and (6) change the bandwidth from the $500 bandwidth to optimal bandwidth by mbens and Kalyanaraman (IK) and Calonico, Cattaneo and Titiunik (CCT), respectively. Regardless of the specification considered, winning the first Kickstarter campaign has a positive and statistically significant effect on the estimated dollars raised after by entrepreneurs.

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

				Discontinuity
Regression Specification	Function of Dollar Difference	Kernel	Additional Controls	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 Kickstarters 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 within the current sample, the differences are not statistically significant.

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

In contrast, the success rates display a 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 provide evidence on Kickstarter's fair terms of use and equitable actions to help end prejudices against and increase opportunities women.

Table 4: Dollar Difference Discontinuity and Outcomes Across Gender

Panel A: Total Raised After

	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***

Panel B: Success Rate

	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 highlights the heterogeneity across estimates depending on the categories selected by the creators. In categories such as Social practice, Software, Apps, Ready-to-wear, and Pet fashion, females experience a larger increase in future total dollars raised. However, males experience larger gains in categories such as television, sound, fiction, Photo and fantasy. On the other hand, results in Electronic Music, Nonfiction, video games, food etc. see little to know difference in total dollars raised after their first Kickstarter campaign.

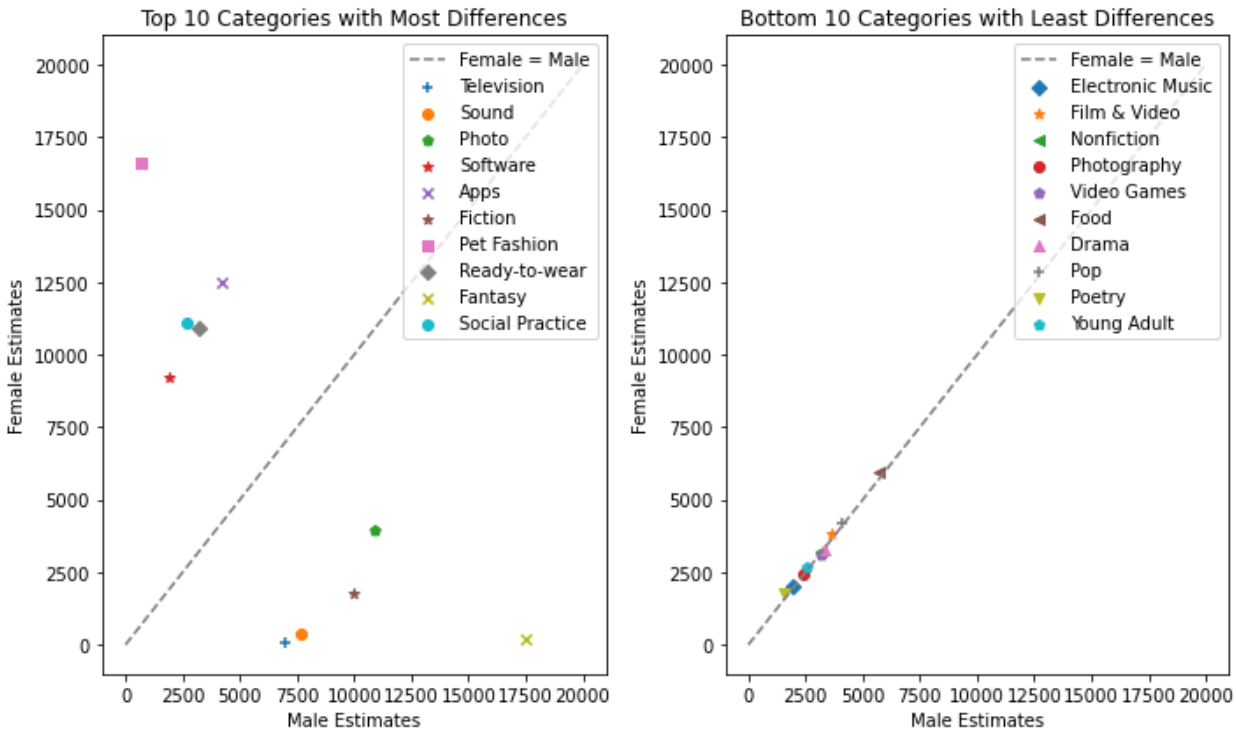

Figure 4: RD Estimates of Top 10 most different categories compared to the least different categories

6 Robustness

6.1 Including Outliers

Keeping all initial Kickstarter campaigns that have failed or completed a campaign with more than $100,000 are considered in this section. Including the outliers changes 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 $3066.24. This shows that outliers near the optimal bandwidth have little to no effect in the outcomes.

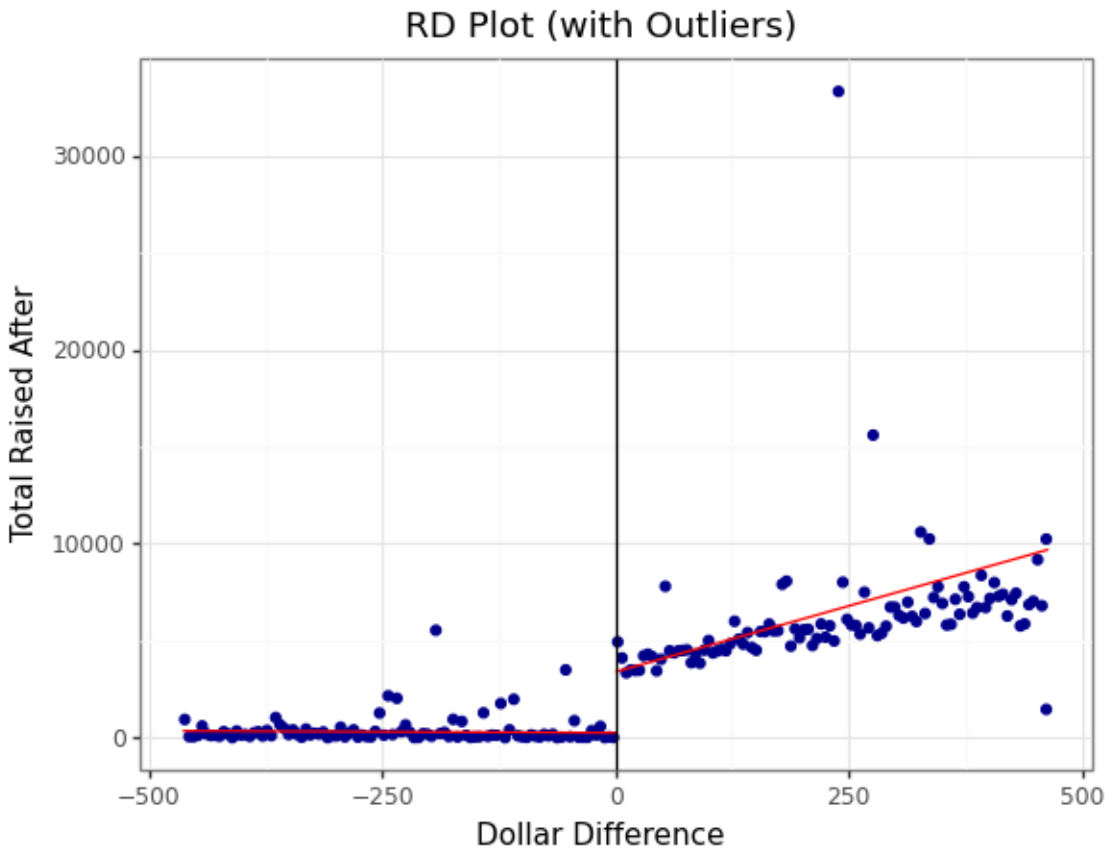

Figure 5: This shows the effect of including 15,687 outliers that have their first projects gaining too many dollars or setting too high of a goal.

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) 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

				Discontinuity
Regression Specification	Function of Dollar Difference	Kernel	Additional Controls	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

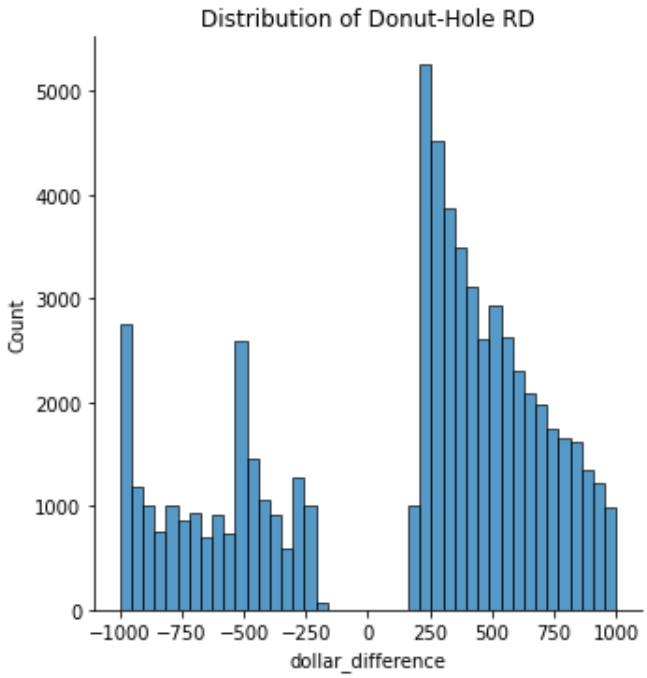

Figure 6: The density of the data when conducting a donut hole RD within a $1,000 bandwidth.

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 perfectly manipulate the dollars raised. 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 that are in the immediate vicinity of the threshold ($200) and reestimate the discontinuity on the samples that are remaining.

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 the results of our sensitivity analysis to the choice of cutoff point. 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 less Kickstarter projects left of the cutoff compared to the right.

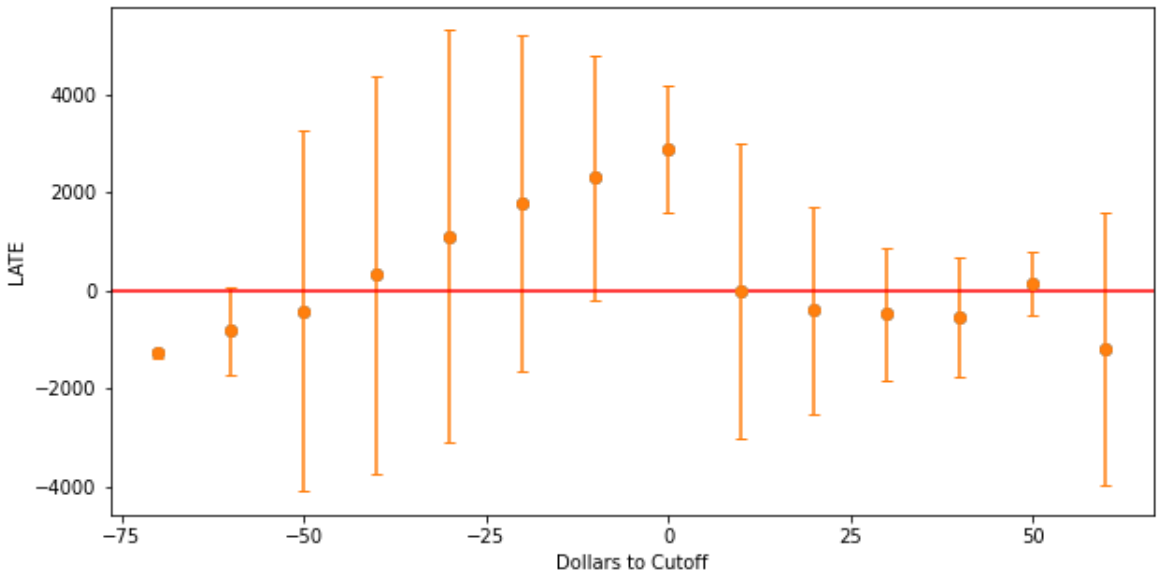

Figure 7: Analysis of LATE on the sensitivity to threshold. It is evident that the true threshold of 0 has a positive statistically significant LATE with largely no effect on any other threshold. This plot uses the optimal bandwidth as suggest by IK i.e. $102.50.

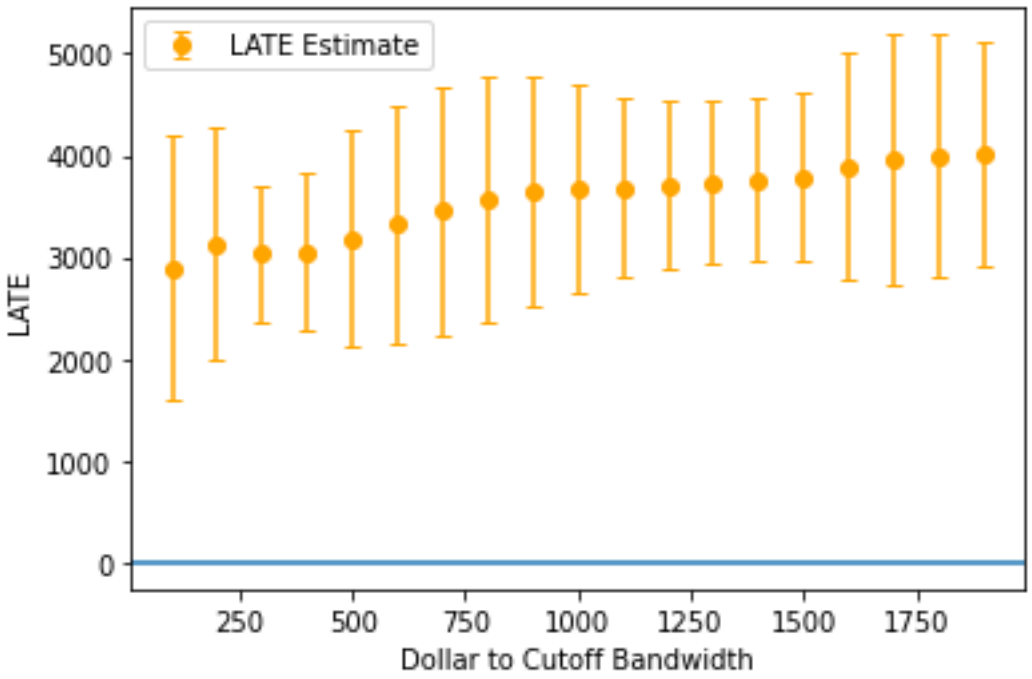

Figure 8: Analysis of LATE on the sensitivity to bandwidth choice. The figure shows that largely any choice of bandwidth is able to uncover the LATE except the extremely small bandwidth.

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 delves into the gender dynamics within Kickstarter, a prominent online crowdfunding platform, aiming to unveil the causal impact of initial Kickstarter campaign outcomes on the subsequent ability to secure funding. The outcomes reveal that men tend to outperform women in the realm of online crowdfunding. These statistically significant exist diminish on all specifications of the design leading to a promising result of using crowdfunding for young entrepreneurs.

The study finds that successfully completing a Kickstarter campaign leads to an increase to total future funding acquired by entrepreneurs that use Kickstarter to fund their future projects. This increase is $3,185 which is approximately 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 statistically differences across gender for higher bandwidths with male entrepreneurs receiving

approximately $1,000 more compared to female entrepreneurs that 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 for 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 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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